

for the treatment of leprosy and tuberculosis, the sulphonamides, thiosemicarbazones and *para*-aminosalicylic acid. Antibiotics in current use, penicillin, streptomycin, neomycin, chloramphenicol, and aureomycin and terramycin are considered next, and most of the remainder of the book is devoted to a discussion of the clinical use of all these agents.

To cover so much ground in a single volume requires careful designing and care in the selection of material, and the authors have succeeded in producing a clear and readable guide to modern practice. The section on veterinary chemotherapy is an interesting account of this young but rapidly expanding field, and is a reminder that the value of the sulphonamides and antibiotics is by no means confined to the treatment of human patients.

In one respect the authors have been handicapped in a way which is almost inevitable. The position of the sulphonamides is established, but new antibiotics are being discovered, and there is still much to be learnt about current ones, and much may happen in the interval between writing and publishing a book. This is perhaps most noticeable here in the sections concerned with bacterial resistance. Recent experience has shown that the development of resistance by bacteria to chemotherapeutic agents is a pressing problem, which more than anything else threatens to nullify the value of the majority of drugs which we now have, and for which a solution is urgently needed. In future editions the effect of this change, and particularly the increase of penicillin-resistant staphylococci, will require restating.

R. A. SHOOTER

THE ASTRONOMICAL OBSERVATORIES OF JAI SINGH

Maharaja Sawai Jai Singh II of Jaipur and his Observatories

By M. F. Soonawala. Pp. x+44. (Jaipur: Jaipur Astronomical Society, 1952.) 2 rupees.

THE astronomical observatories built by the Maharaja Jai Singh II at Delhi, Jaipur, Ujjain and Benares during the second quarter of the eighteenth century are familiar to visitors to these cities. A fifth observatory, which he built at Mathura, no longer exists. The great masonry instruments, generally similar in design at each of the observatories, have no counterpart elsewhere. They are impressive and curious. Jai Singh had the mistaken idea that large fixed instruments of great stability were necessary in order to obtain accuracy; he thought that with small movable instruments the errors of graduations, the wear in pivots and bearings, and the instability of mounting must result in appreciable errors of observation.

Full descriptions of the observatories, and of the design and principles of the instruments, have been given in G. R. Kaye's excellently illustrated monograph, "The Astronomical Observatories of Jai Singh", published by the Archaeological Survey of India in 1918. The volume under review has been published by the Jaipur Astronomical Society, which was founded in September 1948; it has a foreword by the Maharajah of Jaipur.

Jai Singh lived during a very disturbed and troubled period of Indian history, and it is remarkable that in such a time he was able to concern himself with astronomy and to build five observa-

tories. In this book an account is given of his life and of the astronomical contacts between India and Western Europe. This is followed by an elementary explanation of the principles of spherical astronomy which are needed for understanding the design of Jai Singh's instruments. The instruments themselves are described in a final chapter, in which photographs of many of them are reproduced.

The Jaipur Astronomical Society is to be commended for the publication of this moderately priced guide. It will help visitors to these old observatories who have no knowledge of spherical astronomy to understand the design and use of the instruments; but it has also a wider interest as an account of a strange side-track in astronomical instrumentation.

HAROLD SPENCER JONES

ENGINEERING ASPECTS OF ACOUSTICS

Musical Engineering

An Engineering Treatment of the Interrelated Subjects of Speech, Music, Musical Instruments, Acoustics, Sound Reproduction and Hearing. By Dr. Harry F. Olson. Pp. ix+369. (London: McGraw-Hill Publishing Co., Ltd., 1952.) 55s. 6d.

A NUMBER of books have appeared in recent years the purpose of which is to expound to musicians the recent notable advances in acoustics. Their content has been mainly physics, perhaps with an admixture of physiology; but the present volume is unusual in that, as the title indicates, it purports to deal with the subject as a branch of engineering and so emphasizes those parts of technical acoustics in which are comprised building acoustics and sound reproduction. Besides this, the fundamentals of sound, vibrating systems, speech and hearing are covered in outline.

Less usual in books on this subject, there is a brief description with typical acoustic spectra of all the modern orchestral instruments, but surprisingly—because this is where the author could have made his text distinct from that of 'non-musical' books on applied acoustics—little or no mention of the considerable amount of research done in Europe and the United States in the past twenty-five years on the physics of the functioning of such instruments. Considering that in other sections the information is quite up to date, a similar treatment might have been expected of the advances in this field, which at the present time are having their effect in the musical instrument industry. One would have liked, too, more than the four pages which the author feels sufficient to cover electrophonic instruments, 'electronic organs', and the like.

From the point of view of the scientist interested in music, the presentation is excellent. The treatment is non-mathematical, mainly by clear illustrations, while analogues in alternating-current engineering (circuit diagrams) are given whenever possible.

How far musicians without scientific training will be interested in a book of this type is difficult to say; but one imagines such people will still look for technical guidance to the standard works on harmony and orchestration. Indeed, Dr. Olson and his publisher are not helped by the artist of the wrapper, who in a short four-note specimen of musical notation has perpetrated an equal number of musical solecisms; surely a record!

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