section on British evaporites, pp. 224–231, five of the references given in the text cannot be found in the bibliography).

F. H. STEWART

TAYLOR (C. A.) and LIPSON (H.). *Optical Transforms; their preparation and application to X-ray diffraction problems.* London (G. Bell and Sons Ltd.), 1964. x+182 pp., 54 plates, many figs. Price: 45*s*.

This book is very appropriately dedicated to Sir Lawrence Bragg since it was he who first suggested the use of an optical diffraction apparatus to provide an analogue of the results obtained by the crystallographer in X-ray diffraction experiments. In the method of Taylor and Lipson, models of crystal structure projections are made by piercing holes in opaque cards, and their optical transforms (i.e. their diffraction patterns) are compared with the X-ray diffraction patterns from crystals. Correct and incorrect structure models can be recognized, and furthermore the effect of various structural changes can be readily seen, and the contribution of parts of the structure to the diffraction pattern can be determined. These and other relationships can, it is true, be dealt with either mathematically or physically, and which approach is taken is to some extent a matter of personal preference. Some crystallographers are content to do everything by calculation (with the aid of computers) while others prefer to see what they are doing by use of a physical experiment. For many the latter approach will give a greater insight into the processes of X-ray diffraction, and it is certainly of value in teaching X-ray diffraction in a physics course.

The theoretical principles of Fourier transforms and their relation to X-ray diffraction were dealt with in an earlier work by the same authors ('Fourier transforms and X-ray diffraction'), and they have assumed an understanding of these on the part of the reader of the present volume, which deals with the preparation of optical transforms and their application to X-ray diffraction problems.

Taylor and Lipson and their school at Manchester have developed this technique in all its aspects over a number of years. They have constructed a refined apparatus, simplified the procedure for its use, and gained extensive experience in the interpretation of results obtained from it. Any crystal structure worker who wishes to use this method (an apparatus can be bought or built) can now use this book to give him a flying start, benefiting not only by the lucid account of the principles and applications, but also by many of the 'tricks of the trade', which are passed on to the reader.

The extent to which the method has been applied in mineral structures is rather limited as yet, probably because it is most powerful in dealing with structures (mainly organic) in which large molecules make up a substantial part of the whole. Special problems like those of chrysotile and klockmannite have, however, been dealt with, and one wonders to what extent the transforms of silicate structural units (tetrahedra, octahedra, and various rings, chains, and sheets of the latter fragments) might be usefully studied by the optical method.

The book is well produced, with few errors, and it contains many illustrations of optical transforms, which are at the same time instructive and fascinating.

J. ZUSSMAN

SEEGER (A.), editor. *Moderne Probleme der Metallphysik.* Vol. I. *Defects, Plasticity, Radiation Damage and Electron theory.* Berlin (Springer-Verlag), 1965, xvi+445 pp., 192 figs. DM. 59.

This volume consists of six chapters dealing respectively with Dislocation theory (Kröner), Plastic Deformation of Single Crystals (Berner and Kronmüller), Theory of Plastic Deformation (Kronmüller), Electron Microscopy of Defects (Mader), Radiation Damage (Diehl), and Electron Theory of Metals (Bross). The object of the articles is to bring the reader up to date with recent developments in these various subjects. In fact, however, the reviews deal in detail in the main only with the contributions made by the Stuttgart group, particularly in the field of defects and plasticity of crystals. The book will therefore find most use as a convenient compendium of recent work and ideas due to that particular school.

In the chapters on plasticity, the reader is given the impression that as regards the Stuttgart theory, 'alles ist in bester Ordnung', which is somewhat misleading. Thus an elaborate treatment is presented to show that the density of 'forest' dislocations in stage II of the hardening curve of copper single crystals is $\frac{1}{10}$ or $\frac{1}{6}$ of that of the primary dislocations, whereas electron microscope observations have in fact shown these densities to be of the same order. It is also unfortunate that the error in the treatment of the flow stress due to the long range stress from pile-ups (which has been discussed by the reviewer at the 1964 Göttingen meeting of the Faraday Society) is again repeated. It is a pity that the opportunity was not taken to present a really critical account of the current state of the subject.

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