X-RAY CRYSTALLOGRAPHY IN TECHNOLOGY

X-Ray Crystallographic Technology

By Andre Guinier. English translation by T. L. Tippell; edited by Prof. Kathleen Lonsdale. Pp. xiii+330+16 plates. (London: Hilger and Watts, Ltd., 1952.) 56s. net.

THIS book was originally published in 1945 and was a good survey of X-ray crystallography as it was at that time. Since then, many developments have occurred which the author has not dealt with; however, the methods have not altered much, and the book forms a good introduction for the university student and research worker.

There are five parts and twelve chapters. The first three chapters are devoted to a study of the general properties of X-rays, the means of producing X-rays, and the theory of crystallography and X-ray diffraction. Chapters 4-6 are devoted to powder photographs, single-crystal photographs and the special applications of strictly monochromatic radiation. Chapters 7-9 deal with the determination of texture, chemical identification by measurement of cell dimensions, the study of phase diagrams and of elastic strains by accurate measurements of cell dimensions and, lastly, the study of order-disorder states in metals. The closing chapters, 10-12, deal with crystal imperfections, the diffraction of X-rays by amorphous substances, and the determination of the size of submicroscopic particles by low-angle scattering. The first appendix contains fundamental theory of X-ray diffraction too difficult to incorporate in the body of the text, and the succeeding appendixes give material such as tables of data about elements and the relation between θ -angles and the spacing for various wave-lengths which can also be found in the standard reference works. A number of plates are provided to illustrate various types of photographs referred to in the preceding chapters.

The book can be recommended as an introduction to the subject, although it is doubtful whether it will satisfy the needs of the technician, to whom the author specifically addresses the book. The omissions of subject-matter which might be expected in a modern book are no doubt partly due to the original time of its production, just after the Second World War, when there was much isolation of the scientific workers in France from those in Britain and other countries. It is almost certain that X-ray crystallographers need to know much more about high-temperature powder cameras, about moving-film cameras of various types, and more about spectrometers and Geiger counters than is here included. The actual description of instruments is, with only one or two exceptions, confined to the principles on which they are constructed. The technician usually requires to know the merits and demerits of various types, and even how to modify a given type to suit his particular purpose. The treatment given here is too brief and too academic really to serve the technician, though it will be useful to students in general.

There is one innovation which seems unfortunate to me—namely, the introduction of the term 'crystal base' to signify the nature and arrangement of the contents of a unit cell of the crystal. In the German literature '*basis*' is firmly established as the correct word; but in English writing 'basis' has only

occasionally been used and usually the word 'structure' serves. A possible objection to the use of the word 'structure' is that it also signifies the nature and arrangement of the atoms in the whole crystal, though this ambiguity is not usually a serious difficulty. There are, however, weighty objections to the use of the word 'base'. It has the ordinary meaning of 'lower surface', and if the term 'base' is introduced, as in this book, it will be necessary, for example, to make a confusing statement such as "the base of sodium chloride contains four sodium and four chlorine atoms". Further, the plane (001) is invariably referred to as the 'basal plane', and hence the 'base' in morphology means this plane. If the term 'crystal structure' is not adequate, perhaps 'unit-structure', 'cell-structure' or 'cell-assembly' might be used.

The production of the text, tables and photographs is excellent, and there appear to be few misprints.

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PSYCHOPATHOLOGY OF GENIUS

The Infirmities of Genius

By Dr. W. R. Bett. (Medical Viewpoint Series.) Pp. 182+6 plates. (London: Christopher Johnson (Publishers), Ltd., 1952.) 18s. net.

IN this book, parts of which have already appeared in *Clinical Excerpts*, Dr. W. R. Bett sets out to describe briefly the lives of fifteen men of genius and to relate their mental activity to the various afflictions which beset them. Beginning with Carlyle, whose neurasthenia he attributes to dyspepsia, he proceeds to discuss, among others, Shelley, Whitman, Swinburne, Baudelaire, Burns, Byron, Pope and Lafcadio Hearn. In every case he shows that there can be little doubt that the maladies from which his subjects suffered influenced their literary output and their relation to the society in which they lived. This is what would be expected, and Dr. Bett's treatment of his cases is too slight to enable the reader to consider the much more difficult problem of the precise relation that genius itself bears to the medical history of each individual.

There is no doubt that the literary output of such persons as Byron, Pope or Baudelaire was highly coloured by their infirmities; but these misfortunes were merely those which affect many others and which are clearly not related to genius itself. What is more probable is that the man of genius is likely to suffer from psychosomatic complaints which arise from the very fact of his genius setting him somewhat apart from his fellows; and, indeed, the examples chosen by Dr. Bett would seem to some to suggest this, although the cruder physical deformities naturally played their part in moulding the general attitude of those suffering from them.

What has to be distinguished is genius itself (whatever this may be) and the results of that genius as seen in literary and artistic production. How far such production proceeds purely from the conscious mind or is related to subliminal processes engendered by alcohol or drugs, as seems to have been the case with De Quincey and Coleridge, we do not know. It seems clear from Dr. Bett's intriguing study that, in the cases he cites, genius, although at times hampered and restrained, was able to surmount infirmity and add much without which the world would be considerably the poorer.

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