

Scientific Aspect of Chinese Glazes

Chinese Ceramic Glazes

By A. L. Hetherington. (Courtauld Institute of Art.) Pp. x+76+14 plates. (Cambridge: At the University Press, 1937.) 10s. 6d. net.

THIS concise and simply written treatise, which embodies an amplification of a series of lectures given recently by the author at the Courtauld Institute of Art, links together scientific facts and archaeological knowledge concerning the chief glaze effects produced by Chinese potters during a period extending over some two thousand years.

A preliminary chapter is devoted to general considerations on the nature of the glazes, slips and earthenware bodies employed by successive generations of Chinese potters, on the effect of oxidation and reduction upon the colouring materials used in glazes, and on the modifications produced in these colour effects by the relative proportions of acidic and alkaline constituents in a glaze.

It is a striking testimony to the long-sustained art of the Chinese potter that nearly all his earlier colour effects were achieved by the use of only two metals, iron and copper. The old and fascinating 'iron' story, well exemplified by the ceramic ware shown at the Chinese Exhibition in London of 1935, explains the great variety of colour tints induced in glazes by varying amounts of the three iron oxides. Temperature conditions of firing and the presence of alkalis affect the final colour very appreciably. The pale blue ferrous oxide glaze of certain translucent porcelains dating from Sung times, on spectroscopic examination in the electric arc has shown persistent evidence of the lithium spectrum, a fact which points to the

presence of lithia-mica in the original felspathic glaze (Chinese petuntse).

The range of colour produced by ferric oxide is even more extensive than of ferrous oxide, and, as the author has shown experimentally with boric acid and alkali borates, is greatly affected by the acidity or alkalinity of the glaze constituents.

The 'copper' story is equally remarkable, for the colour effects produced by cupric oxide and its reduction product, colloidal copper, are of the highest artistic merit. The author discusses in detail the scientific principles underlying the production of sang-de-bœuf, chün-yao, flambé and peach-bloom glazes, this section being illustrated by several coloured plates.

Under the heading of other glaze effects, a section is devoted to the use of cobalt, manganese and gold. The first two metals are utilized as colouring materials in the form of their oxides; whereas the *famille rose* wares owe their characteristic tints to the use of minute amounts of colloidal gold. This chapter contains also references to opalescence and to crackle, the latter effect being a special and popular feature of Chinese porcelain, which often develops on ageing a delayed crazing or double crackle.

This book, which contains fourteen plates, concludes appropriately with an informative glossary of Chinese and other technical ceramic terms. A selected bibliography is also included of works on Chinese ceramics, among which are to be noted two earlier publications by Mr. Hetherington on the porcelain factories and ceramic wares of China. To these authoritative treatises the present book forms a useful complementary volume.

G. T. MORGAN.

The Future of Statistical Mechanics

Statistical Mechanics:

the Theory of the Properties of Matter in Equilibrium. By Prof. R. H. Fowler. Second edition, revised and enlarged. Pp. x+864. (Cambridge: At the University Press, 1936.) 50s. net.

PROF. R. H. FOWLER'S monumental work on statistical mechanics has, in this the second edition, in his own modest words, been rearranged and brought more up to date. But the new volume is much more than a revision, in that it is explicitly based on quantum mechanics from the outset; the first dynamical equation found written in

the formal presentation is a wave-equation. Prof. Fowler states in justification that although classical mechanics is used to derive the quantum mechanics by a process of generalization, "once the laws of quantum mechanics have been thus guessed, as they must be before we can discuss the theorems of statistical mechanics, quantized systems naturally come first. In 1935 this attitude hardly needs apology". In consequence of this, the concluding chapter of the first edition, dealing with quantum statistics, has been incorporated in the new exposition from the start, and what is