more definitive stage and will be studied with care by all who are interested in electrical double layers and with the colloidal state. The publishers are to be commended for making the work available to the English-speaking world in such a complete form.

Briefly, the authors' object was to examine in detail the potential curves for the interaction of particles which are obtained by combining the repulsion which arises from the interaction of their double layers with the London – van der Waals' attraction. Following preliminary work by J. H. de Boer and H. C. Hamaker, it is found that a fairly complete explanation of the coagulation process is obtained from the consideration of the combination of these two types of interaction, using reasonable values of the London attractive constant.

For many readers the most interesting part of the book will be the discussion of long-range attractive forces between particles, which are large compared with atomic dimensions. It is found by summation between all the atoms that the van der Waals' attraction diminishes comparatively slowly over distances comparable with the particle size. As this would give rise to appreciable forces between large particles, a relativity correction is suggested to the London expression, which has the effect of reducing to zero the van der Waals' forces at distances of more than about 10^{-6} cm.

One consequence of the slow decline of the van der Waals' attraction within this range is the fact that at the greater distances the attractive forces may again exceed the repulsive, giving a shallow minimum in the potential energy curves at distances of the order of 10^{-6} cm. It is suggested that this may produce thixotropy with non-spherical particles and may be responsible for the curious phenomenon observed by Bernal and Fankuchen with tobacco mosaic virus, namely, the concentrated aqueous phase in which the rod-shaped protein molecules are arranged in alignment at distances varying from zero to 300 A. or more.

J. A. V. BUTLER

CORROSION OF METALS

An Introduction to Metallic Corrosion

By Dr. Ulick R. Evans. Pp. xxxvi + 211. (London: Edward Arnold and Co., 1948.) 12*s*. 6*d*. net.

THE author's object in writing this book was, in his own words, "to provide an account of Corrosion short enough to be read from start to finish within a reasonable time". Let it be said at once that he has succeeded in his purpose and succeeded admirably. This "Introduction to Metallic Corrosion" provides a general, authoritative and up-to-date survey of the subject, which the serious student should be able to master in the course of a few weeks.

The format and general lay-out of the book resemble that of Dr. Evans' "Metallic Corrosion, Passivity and Protection", but the text is much shorter, amounting roughly to one quarter of that of the major work. This compression has been achieved by the elimination of a considerable amount of less important detail and the rearrangement of the subject-matter in eight chapters as compared with fourteen. The chapter headings provide an apt summary of the contents and illustrate the simple logical classification adopted by the author: they are: film growth; electrochemical corrosion; corrosion by acids and alkalis; influence of environment; effect of stress, strain and structure; prevention of corrosion by soluble inhibitors; prevention of corrosion by protective coverings; and statistical and mathematical treatment. The same methodical arrangement is followed in the sub-headings. For example, those for Chapter 6, "Prevention of Corrosion by Soluble Inhibitors", are: principles of inhibition; cathodic inhibitors; anodic inhibitors; inhibitive water treatment in industry; pickling processes to remove scale and rust; inhibitive pretreatment.

All this renders the book easy to read and to follow. It will also be evident from these headings that, while Dr. Evans dwells with unequalled authority on the whole range of corrosion theory, he is at pains to deal with the practical aspects of the problem and to render the utmost assistance to those who have to grapple with corrosion in the rough and tumble of industry.

One attractive and likable feature of the book is that references to the literature are reduced to a minimum; even so, 165 are needed. These are segregated at the end instead of being given as footnotes. Too much attention can never be paid in any scientific text-book to details such as this, which, however unimportant in themselves, in the aggregate make all the difference between a readable and a tedious book. As an eminent psychologist has written, "It requires considerable effort even to follow one's inclinations with consistency", and any aids such as this to lighten the burden of study are not to be despised.

The book is prefaced by an excellent historical introduction. In this, Dr. Evans covers attractively, in the short compass of some five thousand words, the development of knowledge of the subject from the dawn of history to the present day. Some of the theories, held even by research workers who are still alive, make rather queer reading now; but the general impression gained from Dr. Evans' survey is that of constant progress resulting from the integration and interplay of the ideas of a large number of earnest seekers after truth. Not all of them have been cast in an academic mould, for as Dr. Evans remarks: "Industrial necessity has led to the investigation of many points which the pure scientist would probably have overlooked".

He gives an example to illustrate this. An even better one might be that intuitive reasoning alone could scarcely disclose that the initial cause of the corrosion of steel railway sleepers is damage to the protective tar coating caused by the hob-nailed boots of the men walking up and down the line!

The only feature of the book about which a little diffidence might be expressed is the final chapter on statistical and mathematical treatment. It might have been better to omit this. Statistics is a highly specialized subject, to which Dr. Evans has made important contributions, and it is no aspersion on the mental calibre of many who read this book to suggest that they will find this chapter difficult. Dr. Evans has evidently considered this point and was, no doubt, influenced in his decision by the fact that the subject-matter had not previously been published as a connected whole.

In brief, this is an attractive, well-written and well-produced book which will fulfil the purpose for which it is intended, and will undoubtedly appeal to a much wider circle of readers than the more comprehensive "Metallic Corrosion, Passivity and Protection". It is fully worthy of the author's high reputation.

J. C. HUDSON