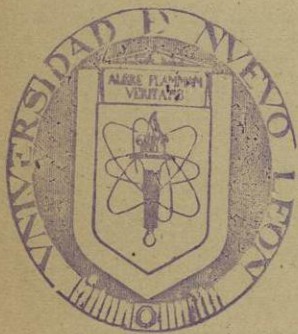


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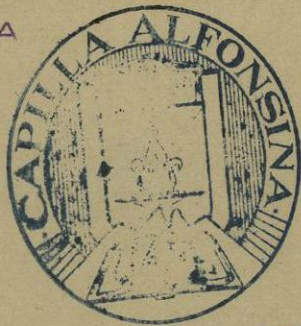
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PREFACE TO THE SECOND EDITION.

WHEN a second edition of the English translation of Osmond's work, which had long been rendered necessary by the exhaustion of the first edition, was projected, the editors were in hopes of being able to avail themselves of the gifted author's promised co-operation to prepare a thoroughly revised and enlarged edition. The work of revision had, however, barely commenced when Osmond's death occurred. It was therefore decided to adhere for the most part to the text of the original translation, published in 1904, the more so as Osmond had himself described the work as "essentially a summary of original researches," and had deprecated the introduction of extraneous matter of a theoretical nature, on the ground that nothing definite had been arrived at in regard to controversial points. Indeed, it may be said that the theory of the transformations of iron and steel remains much where Osmond found it, and that no useful purpose could be served by grafting upon the original work any portion of the voluminous literature on this subject which has since appeared, and has often served to obscure, rather than to shed further light upon, the complex questions involved. So far, therefore, as that portion of the present work

of which Osmond was himself the original author is concerned, the editors have confined themselves to correcting the minor inaccuracies of the earlier translation. In order, however, to enhance the general utility of the book as a laboratory guide to metallography, there have been added in the present edition a translation—the first to be made in English—of the essay on polishing, written by Osmond and Cartaud, and published in the *Revue General des Sciences* in January 1905; some general notes on the practical application of metallography by Stead, which have been reproduced by permission of the Council of the West of Scotland Iron and Steel Institute; and chapters by Stead on segregation, burning, overheating and welding, and on the macrostructure of steel, on sulphur printing, and on heat-tinting.

There have also been added as appendices a note on pure electro-deposited ferrite, and the text of the report on the nomenclature of microscopic constituents, presented to the Sixth Congress of the International Testing Association, held in September 1912, in New York, and recommended by the Association for adoption as a standard nomenclature of its subject.

These additions have been interpolated in what appeared to be their natural sequence in the body of the original work, which the editors venture to hope may be found more complete and coherent, by reason of their inclusion, than it would have been without them.

It remains to add that, so far as the theory of the

transformations of iron are concerned, Osmond, despite all assertions to the contrary, never altered his views from those announced in the original edition, and this fact appealed to the editors as an additional reason for leaving those portions intact in the present edition. In a letter written within a few weeks of his death to one of the editors, he expressed himself as follows:—"With regard to the question of the nomenclature of the constituents of steel, my opinions have undergone no change whatever, despite the discussions which have taken place on this subject"; while, in reply to a suggestion to include an appendix dealing with the Roozeboom diagram and to the further researches to which it has given rise, he wrote: "I am not in favour of this suggestion for several reasons. To begin with, it would change the general character of the work, but chiefly I consider that nothing definite has been arrived at in regard to controversial points. It appears to me, therefore, that all that could be done would be to sum up the different opinions without drawing any conclusions."

In a work bearing on its title-page Osmond's illustrious name, the editors felt themselves bound to adhere strictly to his wishes, and have therefore confined themselves to what is practically a reprint of the original translation, with the additions enumerated above.

J. E. STEAD,
L. P. SIDNEY.

LONDON, *October* 1913.

PREFACE TO THE FIRST EDITION.

THE accuracy of Mons. Osmond's metallographic work has received universal recognition, as is amply proved by the writings of metallographers in Europe and America.

The clear, charming, and accurate micro-photographs with which he illustrates his writings must be accepted as holding a premier position; and the method he has invented and described as the "polish attack" has placed in the hands of metallographers a most perfect means of revealing some of the hidden and complicated structures of metals and alloys.

Before asking Mons. Osmond to publish an English translation of two of his charming papers on Microscopic Assay, the editor has repeated nearly every one of the Assays given in his work on the "Micrographic Analysis of Carbon Steels," and has in every instance confirmed his observations.

The first paper on "Metallography considered as a Method of Assay" was read before the International Association for the Testing of Materials in 1897 at the Stockholm Congress. It was printed in both French and German, but not in English, owing to the feeble support given to the Association, and the apparent want of interest in its objects by English-speaking races.

That paper is a suitable introduction to the researches of the author, and is also a fitting introduction to the second work on "The Micrographic Analysis of Carbon Steels."

The latter is a second edition of one previously published by the Société d'Encouragement pour l'Industrie Nationale in 1895, but is revised, and much of the author's more recent work included. This second edition was published in 1901 by the same Society.

The author has not only authorised the publication of an English translation, but has contributed a final chapter describing the micro- and photographic apparatus he uses and the method of using it, and has also written a special note on Austenite.

It only required this important addition to make the work complete, and it can now be said with justice that there has been no work previously published in English calculated to be so useful to the student in metallographic research. It is, in fact, a standard work on Metallography.

Its unique value is due to the great accuracy of the author's experimental observations. The careful and logical reasoning and the hypothetical conclusions arrived at have their charm, and no one can carefully read them without feeling that they have been made by a master mind, whose one aim is to arrive at the truth.

It is true that some of the hypothetical conclusions have been disputed, and that there are many who do

not accept the author's generalisations regarding the allotropic conditions in iron and steel; it is a fact, however, that they have not been disproved.

As very many metallographers and metallurgists have received them with favour, it is most desirable that English readers should have the data on which they were based, so as to be in a position to form their own opinions.

The scientific use the author has made of his imagination, the constant mental effort to connect cause and effect, has stimulated metallographic research in all intelligent and progressive nations.

Both Mons. Osmond and the editor acknowledge with gratitude the permission for the publication in English of these papers by the Societies before whom they were read.

J. E. STEAD,
Editor.

January 1904.