south-east and north-west England respectively needs a whole book on historical geography for its treatment, but I do recall Sir John Russell's dictum that architecture varies broadly in England and Wales inversely as the rainfall. Perhaps it would have been better to leave out the short reference to the Jews; they are surely far from a "homogeneous race".

If a few reserves have here been indicated, this does not imply any condemnation of a thoughtful and highly suggestive book, which one welcomes all the more because it comes from a man who has been, and is, immersed in public affairs. Darwin's greatest thesis, as is not enough recognized, is that forms of life and their environments are ever acting and reacting on one another and must be studied together. If such studies, from many points of view, could be multiplied, the storms on the military and political horizon would soon diminish; we should understand, where now we so often dogmatize.

H. J. FLEURE.

COAL SCIENCE AND TECHNOLOGY

Coke Formation Process and Physico-Chemical Properties of Coals

By Prof. W. Swietosławski. (Polish Institute Series No. 1.) Pp. viii+145+3 plates. (New York: Polish Institute of Arts and Sciences in America, 1942.) n.p.

PROF. W. SWIETOSŁAWSKI is well known in the realms both of pure science and of coal technology, and his new monograph describing the work of the Warsaw Institute of Technology will be welcomed in both fields. The volume appears to be the first publication of the Polish Institute of Arts and Science in America, and as such has an additional appeal in representing a real effort to save the results of scientific work in Poland from the effects of the War.

The researches upon coal of this well-known Polish man of science have been familiar to workers in this field for many years. His scientific papers have been particularly interesting in that the author has always made a special effort throughout to apply to this difficult subject the principles and technique of physical chemistry. It is most gratifying that he should have been spared to continue his work, and particularly that he has been able to preserve enough of the results of his researches as to produce so interesting a monograph. In the translation of his work into English he has been assisted by Prof. Matejczyk and, although in some places the construction may be a little strange, the general result is very clear and understandable. It is unfortunate that the illustrations were not made bolder—some of the graphs are difficult to read and the details of sketches are difficult to follow—but perhaps wartime conditions are responsible.

The preface to the book is by Prof. H. L. Olin of the State University of Iowa, where Prof. Swietosławski has presented his theories on the physical chemical properties of coal in a series of lectures.

The subject-matter of the monograph, although based upon personal researches, has a strong theoretical and speculative bias which is distinctly provocative in pointing out further lines of research not yet fully explored. The author does not give a full bibliography of the subjects on which he touches—

it would have been unwise to attempt this in so short a volume—but limits himself to certain of the more widely known researches which bear upon his own theories.

Starting with the first subdivision of coal by Stopes into characteristic and recurrent physical forms, the author devotes the first chapters to discussion of the general physical properties of coal, including sorptive properties, ignition temperatures, and in particular the phenomena associated with the softening of coal under the influence of heat and the agglutination which results in coke formation. All these are discussed in terms of the Institute's researches, and only in a very few cases is reference made to, or comparison with, the work of other authorities; for example, in connexion with ignition temperatures, there is no comparison with the findings of Burrows Moore. Also, there is a tendency to attach too much importance to the interpretation of Foxwell's work. It is an interesting theory regarding the behaviour of coal blends on heating that 'activation' takes place with weakly caking coal, which makes the particles of this coal tend to reject agglomeration with those of the caking coal.

Chapters 5-10 describe in detail the behaviour of coals on heating, beginning with a theoretical study of 'melting phenomena' in individual coals, but particularly with the conditions which obtain when briquetted blends are heated through the stage of plasticity. The theories expounded are based on the examination of coals from different parts of the world and are in general those normally accepted in Great Britain. They are novel in their method of presentation, but the novelty lies more in their expression than in the theories themselves.

It is interesting to read that at Warsaw the Coal Division did not hesitate to translate its researches into larger-scale practice in order that they should not be confused by the effect of scale. This was done particularly in connexion with the carbonization of briquettes and the development of a two-stage carbonization process which involved the erection of special retorts. In principle, the process is not dissimilar from that of Parr's method of coking coal which is deficient in caking power. It is noteworthy, however, that the author has been misled by small-scale phenomena in the briquetting of coal under pressure but without a binder into thinking that preheating alone would liberate a binding material within the coal which would make a strong briquette. Actually this is not the case on a large scale, since larger briquettes retain their heat internally to such an extent that gasification continues after the briquette is made, and the structure of the briquette is ruptured by internal pressure.

The last three chapters of the book are more practical in their outlook and relate mainly to the two-stage process of coking coal, and coal blends, and coal-pitch blends, and to the description of a proposed new process in which the author postulates two stages of heating on the lines of Parr's work.

The book is printed and presented in a pleasing style, and although the sequence seems a little disconnected in places, the arrangement into paragraphs makes for easy reading and gives the author freer scope in his development of the theoretical side of his thesis.

In conclusion, one may express the hope that still more books of this valuable character may follow this first effort by the Polish Institute of Arts and Sciences in America.

J. G. KING.