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Book Review

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Book review

Lea's Chemistry of Cement and Concrete

P. Hewlett and M. Liska (eds). Butterworth-Heinemann, Oxford, UK, 2019, 5th edn, ISBN 978-0-08-100-773-0, £200, 896 pp.

Many concrete technologists have a short list of key references, which are the places where they look for reliable technical information. Since the first publication of Lea and Desch's book in 1935, this volume of knowledge has continued to be a key reference for many concrete technologists, scientists and engineers. The fourth edition of this book was published in 1998 and since then there have been many changes in cement types and production. Consequently, this fifth revision is most welcome as it deals comprehensively with the chemistry of cement and concrete, including the changes over the last two decades.

In a short review it is not practical to try and list all the changes from the fourth edition, but the driver for change is clear; it is to improve the sustainability of concrete solutions and in particular reduce the global warming potential. Concrete solutions account for about 7% of the emissions leading to global warming and while concrete solutions are no worse than solutions using other materials, concrete is used in vast quantities and this accounts for its significant contribution to global warming. Hence the need to reduce the impact. For example, chapter 2 describes the changes in the manufacture of Portland cement to make it more energy efficient; section 4.13 lists the wide range of cements that are standardised (the ongoing trends are to reduce the Portland cement clinker content of cement and move to ternary blends);

and chapter 8 describes the production of low-energy cements. The new chapter 16 – 'Geopolymers and other alkali-activated materials' – introduces alternative cement types to the traditional range of Portland cements. *Magazine of Concrete Research* readers contemplating new research projects may have particular interest in the list of open questions given in section 16.7.

The second new chapter on 'The influence of the water/cement ratio on the sustainability of concrete' is strongly recommended to both researchers and practitioners. This revision was the work of 31 experts working alone or in groups of two or three, and inevitably there is some degree of duplication; however, I do not regard this as a disadvantage. At a length of 896 pages, this is not the sort of publication you sit down and read from cover to cover; it is the sort of publication you dip into for the specific topic you are researching. Consequently, it is more reader-friendly to have, for example, the table of cement types in front of you without having to move to another chapter.

As a reviewer of papers for *Magazine of Concrete Research*, I will be using this publication to check that the paper is original and that the references in the paper give credit where credit is due. As most *Magazine of Concrete Research* readers are involved in research, this publication provides an excellent state-of-the-art and a good start on relevant papers to study.

In summary, the fifth edition is a substantial work and a worthy successor to its predecessors.

Tom Harrison