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# Guest Editorial

*Dear reader!*

This special issue presents *capita selecta* from 133 contributions in the Proceedings of the 13th International Conference on Alkali–Aggregate Reactions in Concrete (ICAAR), held in Trondheim, 16–20 June 2008. The conference was attended by 175 delegates, representing 31 countries on all continents. Deleterious ASR (alkali–silica reaction, a subset of AAR) is sometimes considered a fringe issue, however, a global expenditure of 2G EUR *annually* on repair, rehabilitation and replacement of existing structures more than justifies extensive academic research on ASR, as well as the organizing of a quadrennial conference.

Whereas fundamental parameters in science are considered eternally constant, our insights on how to interpret observations (i.e. 'science') do evolve over time. Therefore, scientific knowledge is provisional, valid only until a more accurate rendition of reality arrives. This kind of evolution is exemplified by the contributions from Katayama and Grattan-Bellew et al. on ACR, alkali–carbonate reaction (another AAR subset). Both provide convincing arguments that damage previously recognized as 'ACR' in fact is 'ASR in disguise', caused by reactive silica cryptically present in the carbonate aggregates investigated here. At the Trondheim conference, the first ever 'Gunnar M. Idorn Award for lifetime achievement' was presented to Katayama, for his outstanding contributions towards understanding the nature and mechanism of ACR.

Reliable and consistent expansion testing is rather an art than a sinecure, as shown by Fournier et al. and Ideker et al. from North America, and Lindgård et al. from Europe. They find that inter-laboratory variation when testing identical aggregate materials can be minimized to a useful level by prescribing rigorous procedures. However, non-reactive standard reference materials do not always behave as expected, and expansion results still need to be verified by post-mortem petrographic assessment of expanded specimen. Unfortunately, the latter is not (yet) advocated in reigning test procedures.

Further contributions report diverse material and structural aspects of deleterious ASR, including use of waste and recycled materials, the effects of admixed chemical inhibitors, and the influence of infiltrated external alkali from seawater or acetate/formate deicers on alkali-reactivity. Finally, several contributions present applications of recasting experiential or theoretical data into models, to simulate or predict behavior in virtual reality.

At the time of publication of this special issue early 2010, deleterious ASR sees its 70th anniversary after its first recognition by Stanton in 1940 [1]. Many thousands of published papers and thirteen dedicated conferences later, the undesired alkali-reactivity of some aggregates still leads to material and structural decay, and eventually the untimely end of concrete structures' service life, burdening society with great expenses and occasionally compromising public safety and security. Deleterious ASR is a complex and grave type of concrete damage, illustrated well by the diversity of topics in this special issue. To a large extent, ASR's complexity originates in the natural diversity and variation of the geological materials and their derivatives used for concrete making.

The collection of papers in this special issue represents the cream-of-the-crop of the 13th ICAAR, and I am confident that some of them will garner landmark status. However, for its provisional character, all knowledge precipitated here will eventually become outdated and obsolete, which is all the AAR community can hope for. This may seem a paradox but it really is a virtue: when it happens, it will mark progress.

Enjoy reading!

## Reference

[1] T.E. Stanton, Expansion of concrete through reaction between cement and aggregate, Proceedings of the American Society for Civil Engineering 66 (1940) 1781–1811.

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