Editorial

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In issues 23 and 24 of volume 71 of *Magazine of Concrete Research*, eight papers were published in a two-part themed issue covering the sustainability issues of concrete. Such has been the interest and volume of papers received on this topic, another two issues comprise this next part of the themed issue.

By considering concrete's sustainability concerns, regard must be taken of the concept of what comprises a concrete. What is meant by alternatives? Does concrete have to be Portland cement (PC)-based or a composite based on PC? Habit, reality and tradition yield a reassuring approach to designers, providers and users of concrete, so maintaining commitment to the use of PC. If, on the other hand, we define a concrete as a 'coalescent material comprising a binder and fillers', and by coalescent we mean forming a solid mass or blend, then many options become potentially possible. However, alternatives should be capable of the performance previously provided by PC-based concretes coupled with some relative additional benefit (e.g. low carbon content, greater durability, ready availability, etc.).

All this has usually to be provided at no increase in costs. The latter limitation is often not achievable but if society at large is committed to reducing the carbon footprint of what we call concrete, a change in attitudes may be inevitable. The matter of cost is often not addressed by researchers seeking alternatives and can restrict the adoption of new alternatives.

Turning to the papers in this themed issue, the first two papers in issue 9 result in potential practical outcomes. There are fly-ash-based mortar wall panels using bamboo as reinforcement (Puri *et al.*, 2020), alongside fly ash, glass powder and ground granulated blast-furnace slag (GGBS) composites with the replacement of natural sand by lead shale slag (Gholampour *et al.*, 2020).

The supporting two papers in this issue include straw-based lightweight and thermally insulating concrete (Kammoun and Tirabelsi, 2020), plus the synergistic enhancement of recycled aggregate mortar using accelerated GGBS (Santha Kumar, 2020).

The complementary first two papers in issue 10 include the use of industrial wastes (value added?) such as pulverised fuel ash and GGBS (McCarthy *et al.*, 2020), with another example

where fresh water is replaced by seawater (Kang and Kim, 2020). In addition, the two accompanying papers cover glass-fibre-reinforced geopolymer concrete (Dong *et al.*, 2020) and the reactivation of hydrated cement paste to improve the quality of recycled-aggregate concrete (Ohemeng and Ekolu, 2020).

In all, an eclectic mix reflecting activity aimed at providing alternative options that nevertheless must find the means of being recognised within construction and building activities. This can be a problem if national and international standards do not exist for such materials, leaving what may be a somewhat piecemeal package of options carrying commercial risk for designers and specifiers.

Notwithstanding these difficulties, there is much activity in the quest for alternatives to PC-based concretes and themed issues on this particular topic may well continue.

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