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Editorial

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It is with great pleasure that I write my second editorial as a member of the editorial advisory board of *Construction Materials*. My main area of expertise is concrete technology but I do recognise that although concrete is a ubiquitous material it is not the only construction material. Concrete still, however, features heavily in current research but the emphasis has shifted towards sustainability related issues. There has been increasing concern recently over how our activities affect the environment. Cement production is said to contribute 5% of the world's total carbon dioxide emissions. This figure is likely to rise with the increased demand for infrastructure in developing countries. At the same time the production of concrete requires large volumes of raw materials most of which are quarried. We seem to forget, however, that the inert fraction of concrete – that is, the aggregate – has many applications in construction projects and is not only used for the production of concrete. Bituminous road pavements is another large volume use of aggregate in construction projects. It is therefore important that we consider reducing our reliance on quarried materials by seeking secondary materials that are either recycled from concrete itself or that are derived from suitable waste streams that would otherwise be sent to landfill. It is essential, however, that we fully investigate not only new quarried aggregate sources but also recycled materials for their short- and long-term effects on concrete construction before their widespread use by industry. Durable concrete structures are required for a sustainable built environment. We therefore need to improve our understanding of how we can increase the design life of structures through selection of appropriate materials or through better understanding of how inadvertent factors, such as alkali–aggregate reactivity, can affect their long-term behaviour.

It is interesting to note that the briefing appearing first in this issue of *Construction Materials* is about the future of construction material research (Goodier *et al.*, 2014). The Young Researchers' Forum provided an opportunity to showcase the variety and diversity of current research. This included timber for structural applications, use of waste materials in construction, materials for nuclear waste immobilisation, cement hydration, durability of structures and materials testing.

Aggregates are the major constituent of asphalt mixes and as such the properties of the aggregate significantly affect the strength of the asphalt mix and the overall behaviour of pavements. A simple and quick test is presented in the first paper (Kumar *et al.*, 2014) that can assist in the selection of the most appropriate aggregate for the application considered.

The second paper, by Ganaw *et al.* (2014), considers the preplaced aggregate method of placing concrete. The method has been around for several decades but has not received as much attention as pumped concrete mainly because it can be considered as a special concrete. The method can be by far the most economical in some places or decision to use it can be because of favourable properties achieved in the cast-concrete structure. Materials should be proportioned to produce a grout of the required consistency which will provide the specified strength after injection into preplaced aggregate. This paper examines the rheological properties of such grouts required to ensure their proper placement.

The topic of the next paper is alkali-reactive aggregates. Fernandes *et al.* (2014) stress the importance of performing petrographic examinations on aggregates with no experience of their use in structures but also periodically on aggregates from known sources. There are a number of reactive forms of silica occurring in not only metamorphic rocks but also in some igneous rocks, for example, granites. Petrographic examination requires a lot less time than expansion tests and therefore should be used more often.

The final paper (Zografou *et al.*, 2014) investigates the possible use of china clay waste as aggregate in alkali-activated binder mortars. It is surprising that for 1 t of china clay produced in the UK, approximately 9 t of waste is generated. It is not therefore surprising how deleterious clay production is on the landscape where it is produced. The potential reuse of such waste as fine aggregate for the production of geopolymer 'cementless' concrete products, such as blocks and roof tiles, will certainly have environmental benefits.

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