

Guest editorial comment

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Concrete research in the UK

It may seem curious for a practising engineer to be writing a guest editorial in the *Magazine of Concrete Research*. If this is thought to be unusual, in some ways it sums up the attitude to research in the UK. However, research should not be regarded as an indolent activity for the gratification of a few academics. Any industry which does not concern itself actively with research is bound to become moribund. In my terms, research is not purely confined to academic ivory towers, but rather it encapsulates every part of the industry, including materials, design, construction, maintenance, repair, and also the effective management and control of these processes.

There are many reasons why research is important, but I list four below.

- (a) Research investment in the UK construction industry is pitifully small compared with that in other industries such as electronics or pharmaceuticals, whose profitability and market share of firms are directly proportional to their research investment. At the very least this must be a basic motivation for research in concrete, the market share of which has fallen dramatically in the last decade. It is no coincidence that the main competitor in the market place, i.e. steel, has made inroads into the market largely through innovation, fully underpinned by competent research.
- (b) Concrete had had a bad press for some time. Following the DOE's announcement that the tower blocks in Marsham Street are to be razed to the ground, *The Times* came up with a list of other buildings which in the opinion of its architectural correspondent deserved a similar fate. It was depressing to note that the majority of them, if not all, had concrete facades! While research cannot anticipate changes in fashion, fundamental research has a role to play in the avoidance of

some of the long-term problems which manifest themselves in concrete.

- (c) Research is also essential for the intelligent management of change and the exploitation of changes to our best advantage. Our industry is changing in many ways. In European terms 1992 is seen as a watershed, and we are about to be confronted with more products, concepts, designs and methodologies from the Continental mainland. Some of these will undoubtedly pose stiff competition to our existing methods and all will need to be appraised carefully. Typically, ductility of reinforcement has been decreasing over the years. It is only now that this subject is being seriously addressed to determine the level of ductility required in design. Too many changes in cement have taken place with inadequate recognition of their effects.
- (d) We are in an era of diminishing resources. Therefore recycling, re-use of waste energy in production and use, and maintenance costs, are all worthy of investigation. 'Green' issues are also relevant. Pollution related to the concrete industry will also need examining.

For these and other reasons, it is clear that research is a continuing activity which should be seen as an essential ingredient of a forward-looking industry.

Dissemination of research findings to the practitioners—not just designers but contractors and other users—is or should be an integral part of research itself. Each probably requires different techniques appropriate to end needs. It should always be done in a form which is readily understandable and usable in routine work. Every piece of research should have this as its end objective. I am certain that considerable research done in the 1960s has still not been fully disseminated and broadcast to the industry in a usable

form. There may well be some lessons to be learnt if one correlates the 'failures' that have occurred and the research findings which predated them.

However in the area of dissemination there is a potential problem. Commercial research is often, if not solely, funded to capture a niche in the market by a particular firm. Confidentiality is often imposed. It would be naive to expect that 'he who pays the piper' will not call the tune. However, a broader principle of collective interest of the industry must also be recognized. Products will be used with confidence only if the details of research are made available to the user. Also, researchers often benefit from the details of research undertaken by others. At the very least this avoids reinventing the wheel; at best it allows more rapid progress. We therefore need to find a mechanism by which such details could be made available. I would suggest that the confidentiality should be lifted after a shorter duration, the length of which can be debated. When it comes to fundamental research which is essential for studying long-term problems, I see no reason why confidentiality should be imposed at all. If it is to take place, such research is likely to be funded largely by public bodies, in which case they should see it as an obligation to publish the full details as soon as the research is completed. There is still an excess of secrecy surrounding much work commissioned from public funds (including EC funds).

Surveying the UK scene, some research is going on in a number of places, such as academic institutions, government research bodies and private laboratories. Development work which extends applications also occurs in many consultants' offices. The activity is rather disparate and unco-ordinated. There is very little communication between the industry and the researchers in agreeing priorities; there is thus a desperate need for a focal point dedicated solely to concrete research. Such a body should be led by the industry, and should embrace all the partners in the

industry. It should be a dynamic centre of excellence with acknowledged expertise in all aspects of the concrete industry. It should help to market 'Concrete' through sound technical reasoning. It would not in any way detract from the commercial marketing of individual products or systems; rather it would assist them. It could also assist in the education and training which is vital for the future. Such a body would also raise the profile of the need for research in concrete and 'fight the corner' for concrete in forums such as SERC who distribute funds for research. Generalist research organizations are no substitute for a specialist centre for concrete. There have been worthy attempts in the past by bodies such as the National Economic Development Office and the Institution of Civil Engineers to create focal points for the construction industry as a whole. The reasoning behind these are equally valid for a focus for concrete.

Research does not come cheap and needs adequate funding. Many options are available, e.g. levies on component parts of concrete, levies on organizations, tax incentives and insurance surcharge on completed structures. Clearly each has attractions and disadvantages. The ease of collection and the effect on the competitiveness of individual firms should feature as primary criteria in selecting the options. Clearly a very detailed study is needed before a fuller discussion can take place.

There should be an enlightened recognition by the industry that investment in research and its effective dissemination makes commercial sense and is essential for its continued existence and prosperity. The industry should take urgent steps to create an authoritative centre, dedicated solely to concrete research. In the longer term, the market for such a centre is not merely confined to the UK. Without such a focal point the whole of the concrete industry will be the loser.