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Editorial

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The introduction of any new material or method into civil engineering structures has to be done with considerable care. Engineers generally have to be aware of the wide range of problems that can occur with the implementation of new materials and methods, in particular because of the requirements of public safety and durability issues.

There are a number of examples where things have gone wrong through lack of understanding of a new technique or unforeseen behaviour of material causing problems. The box girder failures, including Milford Haven in 1970, were an example of extending the technique beyond the limits of the available data on the behaviour of plated structures. The problems associated with alkali aggregate reaction in the United Kingdom were due to changes in the composition of cement and the use of reactive aggregate. Both led to expensive failures. However, the subsequent research and development that was carried out produced guidelines in order that the problems did not recur.

Over the last few years there has been a steady flow of papers in *Structures and Buildings* about the use of reinforced polymers and, in particular, carbon fibre reinforced polymers (CFRP). Many of these have had a strong research bias. It was therefore extremely interesting to attend a recent one-day conference held in London on advanced composite materials, organised by *New Civil Engineer*. The speakers were mainly drawn from industry and were users of these materials. In almost all the presentations, the importance of the background research carried out, usually in universities and often reported in *Structures and Buildings*, was noted. That is not to say that because advanced composites are being used there will not still be a need for continuing research and development in order to identify fundamental behaviour, other applications, and possible limitations. CFRP is currently widely used in sports equipment, mainly for its high strength-to-weight ratio. However, anyone watching the recent Tour de France will have seen how one competitor hit a dog at some speed and the front wheel of the bicycle, which was constructed of CFRP, collapsed and shattered completely! Engineers will need to be made aware that although these materials possess many excellent properties there may be a lack of ductility! Hence there will also be a requirement for training and education of the users of these materials in order that they are aware that advanced composites have different characteristics to other materials in common structural use.

There are a number of opportunities for all structural engineers to be involved with the development and use of advanced composites and I hope that the results can be reported in *Structures and Buildings*. With this in mind we are planning a special issue on advanced composites, details of which will appear in the near future.