Editorial

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Welcome to the February issue of the *Proceedings of the Institution of Civil Engineers – Forensic Engineering*.

The first paper, which sets the scene for those that follow, is a briefing by Ratay (2015). The briefing is based on the keynote presentation he delivered at the ICE 5th International Conference on Forensic Engineering, London, 15–17 April 2013. The purpose and intent of the briefing is to draw our attention to what Ratay refers to as the ‘rewards’ that can arise from structural and construction failures. He does not use the term ‘lessons learnt’ I think deliberately, because he identifies two distinct features of failure. First, there is the need for awareness of the benefits to many areas of the construction industry that can accrue from the analysis of catastrophic failure, which may lead to the prevention of future failures. Second, there is the need for industry professionals, in our case the forensic engineer, to champion the effort for productive change. In other words if we do not push for appropriate change following a failure lessons will not be learnt. Ratay points out that this is often not as simple as it sounds due to the understandable emotion and knee-jerk reactions that may follow a catastrophe or, as Dickie shows in our final paper, commercial or time drivers lead to advice being ignored.

The second paper is also a briefing and follows on from Ratay in that it illustrates how forensic investigation can lead to discoveries that could improve the standards applicable to critical vibration levels in buildings arising from, for example, traffic. Smith (2015) investigated reports from the residents of a house situated close to a road that vibration from traffic was high and had caused cracking to the house. Initial investigation showed that the expected vibration levels met the relevant standards. Testing was then carried out on site the results of which showed that there were unusually high ‘shock pulses’ occurring instead of the expected steady vibration. The short duration shock pulses were such that they were within both the human and building response range. Smith considers that although the combination of the ground conditions and road construction particular to the site were unusual the study shows that current standards should be modified accordingly to account for short rise time shocks. I think this briefing shows that ‘failure rewards’ need not necessarily be from catastrophes but can emanate equally from more humble origins. You will need to read the briefing to find out what the unusual cause was and to appreciate the physics.

Malsh *et al.* (2015) introduces a new term to me – forensic information modelling, although I now understand from the paper that it was conceived in 2008. We hear a lot about building information modeling (BIM) and this paper shows us how, in time, the BIM model could be adapted to become a forensic (FIM?) model. However, for structures that were built some time ago, pre-BIM, the model must be created, either from scratch, or by combining information from different databases. The paper illustrates how this was done for three projects in the USA; the investigation into a high profile bridge collapse, the emergency refit of components to another bridge and the multi-year inspection of the façade of a large building. The paper describes the painstaking process of assembling, labelling, recording and then the updating of data that must be carried out to create the model then, significantly, the rewards that can be realized when the model is put to use and analysis and predictions can be made.

It is a recurring theme amongst forensic engineers in the UK that the release of valuable information that could be used to understand lessons to be learnt following a construction failure is often prevented or at best delayed. The reasons for this include privacy, commercial confidentiality, insurance risk and have been described fully in other papers in this journal. I was delighted to learn in our fourth paper (Trombetti *et al.*, 2015) of the establishment, in 2012, of the Observatory Claudio Ceccoli within the Faculty of Engineering at the University of Bologna, Italy. The observatory is a research centre that works in close collaboration with the Court of Bologna and has access to the archives of the Court, which provides technical documentation from cases heard by the Court. The objective of the centre is to analyse such data and to record findings on a web based database which will be accessible to engineering practitioners. Some examples of the output are illustrated in the paper. This paper reminded me of two of the papers in the special themed issue of this Journal that followed the ICE 5th International Conference on Forensic Engineering (Volume 167, issue 1, http://www.icevirtuallibrary.com/content/issue/feng/167/1_). In that issue Terwell *et al.* (2014) describes a similar link between research and the Dutch arbitration system and Breyse and Ndiaye (2014) who described a prototype database in France for the collation of failure data. Perhaps, through this journal, further international collaboration can be encouraged and rewards obtained.

The final paper by Dickie (2015) shows us how even though thorough research and testing can be carried out the findings and recommendations may not actually be implemented which, in the circumstances described in the paper, may lead to far reaching consequences. The Summer Olympics held in London in 2012 are regarded as an exemplar in how one of the largest events in the world can be procured, managed and enjoyed by a worldwide audience. One of the features of the London games, in addition to the legacy infrastructure, was the number of temporary venues. By their nature temporary structures present challenges to designers and constructors, not least due to the terminology which may suggest that they are somehow less important than permanent structures. Dickie presents the results of observational recording of crowd movement during pre-event testing for two of the temporary seating stands that were to be used for the games. His findings showed that the flow rates and exit times demanded by the regulatory body set up to oversee the games development were not achieved in the tests. He made his findings known but not all of them were incorporated into the final temporary stands that were constructed. The implication is that because the venues were regarded as successful and that no serious accidents occurred that the configurations adopted may have an unofficial Olympic endorsement which as Dickie points out, if the errors identified are adopted elsewhere 'a serious accident will eventually occur.' Perhaps, in the follow up discussion forum of the journal, a means of communicating his findings can be identified.

Appropriately, as a book end, the final paper is a book review. Kandasami (2015) provides us with a review of *Damage Assessments for Residential and Commercial Structures*

authored by Petty. The review certainly made me want to read more and I am indebted to Kandasami for bringing it to my attention.

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