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Editorial

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This issue of *Engineering Sustainability* breaks new ground with the reproduction of a seminal paper¹ together with a modern commentary.² Occasionally visionary papers are published in the literature and yet can become forgotten, or lost to a new generation of readers, other than featuring as a reference in modern works, whereas in fact they should remain central to the debates that are taking place. In an attempt to facilitate full and proper reflection on where we have got to with the issue of 'environmental protection', the original paper has been published in full and a commentary has been written by Richard Ashley to discuss how well, or poorly, we have advanced the ideas and acted upon them. Interestingly, the commentary explains how terminology has altered in the intervening period and shows how the discipline of engineering sustainability has become established. We are now far better placed to construct the structured arguments, and provide the evidence bases, for demanding change, and yet there remain major battles to be fought in spite of the evidence. It is interesting that this republication has occurred at a time of difficulty in the financial markets, when one might suggest that this sustainability thing is a bit of a luxury and for now we should concentrate on the economic pillar until we get our economic house in order. This would be a grave mistake indeed, for many of the reasons expounded in the two above documents, and in fact the recent US proposal to buoy the economy by funding research into alternative energy sources perhaps provides a more enlightened approach in terms of where our focus should lie.

The national press has recently been publishing articles on water scarcity, and notably the cost of production of everyday items in terms of water (1 litre of beer costs 300 litres of water, a hamburger 2400 litres, 1 kg of beef 15 500 litres, and so on; see www.waterfootprint.org). Taking Semple's and Ashley's arguments forward in the current climate, and noting that the term 'peak ecological water' has been coined by Dr Peter Gleick of the Pacific Institute in California to lie alongside the concept of 'peak oil' – a natural limit on something previously considered to be in plentiful supply – the focus on research on alternative approaches to energy should be widened to other essential resources as a matter of urgency. The article in the national press that highlighted these issues was published in *The Times* on 22 January 2009³ and went on to discuss an analysis of the causes of wars,⁴ with the conclusion that water has all too often, and given the current trends will increasingly become, a reason for tension between communities. While wars over scarce resources are the final drastic consequences, the urgent need to

address the issues raised by Semple is incontrovertible. There is an underlying imperative to the above discussion: it is not simply research into alternative energy (or whatever) sources, but research into alternative approaches to the use of energy (or whatever) that is needed.

The first paper continues this water theme by considering the water balance between people's needs, or more accurately wants, and maintaining flow regimes to preserve the natural environment. The authors sum this up more eloquently as 'appropriate mitigation of anthropogenic impacts on river ecosystems resulting from water abstraction and impoundments'.⁵ It discusses this topic in the light of the Water Framework Directive, which aims to provide a means of regulation across Europe that will deliver sustainable water management. The juxtaposition of this paper with the previous two contributions is fortunate indeed. The question that I would raise is how much can be achieved by regulation, and how much must be achieved by a change in attitude of individuals who use the water as the consumer?

The second paper focuses on the role that green infrastructure might play in improving the quality of life of those who live and work in urban areas.⁶ The paper highlights the many benefits that derive from the introduction of green infrastructure into existing urban areas, or the planning of green infrastructure into new urban developments. This is an issue that is close to my own interests, which include the greater use of underground space to free up the surface for such urban environmental improvements. This must be done with care to ensure that maximising, or perhaps more importantly optimising, biodiversity is included in the picture, and this is discussed. The paper touches on the important associated benefits of climate control, and hence energy reductions, that the green infrastructure can deliver and places the arguments firmly in the context of economic regeneration.

The third paper returns to my recurrent theme in these editorials of addressing the 'how to' of sustainability. In this case it demonstrates the 'how to' of managing knowledge to facilitate the engagement of stakeholders in the decision-making process.⁷ The subject of sustainability is necessarily so very broad that a knowledge management system of some sort becomes essential if the knowledge and experience of those working in the many interacting disciplines is to be captured and exploited. This is a theme that is well understood by

engineers: we are beasts of experience, and can only practice independently when we have built up a suitable reserve of experience, so capturing this experience for the use of others is something that is an ever-present concern. This paper is the outcome of one of the many Sustainable Urban Environment projects, funded by the Engineering and Physical Sciences Research Council (EPSRC), on which many of the researchers in sustainability are currently working. This excellent paper provides justification for continued funding of this EPSRC initiative.

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