

# Discussion: A short history for the future of engineering

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## Contribution by Kristy Revell

This contributor, a young engineer, read the article with fascination. Other students at the university where the contributor studies also agree with the author's views. Unfortunately, outside the university the contributor often feels isolated in thinking that the civil engineer is not equipped for the future. During the Industrial Revolution the profession of civil engineering emerged and reigned supreme (Steels, 2010: p. 185), yet today, it is unfortunately undeniable that civil engineering, as traditionally perceived, is an industry with waning power.

This contributor believes that one of the reasons why the civil engineer has lost power is because the term has become redundant. To describe the 'civil engineer' today is to describe a collective of engineers who have chosen to specialise, to become structural, geotechnical, municipal or highways engineers and so on. It is the contributor's belief that it is no longer appropriate for 'civil engineer' to remain in use as this umbrella term. Instead, the role of the civil engineer needs to be redefined to better fit the definition of a civil engineer presented in the Institution of Civil Engineers (ICE) revised Royal Charter (ICE, 1972), with the author's additions.

To fit this definition civil engineers must now be people who have an overall knowledge of many specialities. They must combine the roles of environmental scientist, anthropologist, sociologist, geographer, planner, urbanist and architect and of course they must also understand the specialisations of their colleagues. They must understand the work of geotechnical, structural, municipal and highways engineers. They must also have an understanding of law, risk, ethics and, ever increasingly, politics. Only with an appreciation of all these knowledge areas will the new civil engineers be able to look at the bigger picture and start to solve the problems of the twenty-first century.

This contributor agrees wholeheartedly with the future challenges that the author outlines and believes that if civil engineers are equipped with this broader knowledge base, the new civil engineers will be in a position to organise and manage the interdisciplinary specialists who need to work together to solve the future problems that civil society will face. This contributor

proposes that the civil engineer of tomorrow should be the architect of the future, the person who organises those who collectively can solve these vast problems. The question, however, is how can the situation be progressed from the current 'civil engineer' to this 'new civil engineer', the civil engineer of tomorrow.

There is evidence that steps are being taken to ensure that the new civil engineers are better trained. Some universities are changing their degree courses so that graduates are better equipped to deal with the future challenges by providing undergraduates with a broader knowledge base but it seems that ICE and industry continue to lag behind and this is the real challenge. The author suggests that young engineers will need to make the change but how can young people be placed at the forefront of an old-fashioned industry in which a young engineer's opinions are only really respected after that engineer has achieved chartered status?

## Contribution by Ian Jenkinson

The author is wrong to suggest that 'At a local level, engineers have abdicated the responsibilities of the county surveyor and the borough engineer'. This is blaming the victim for the crime that has been committed. There are many reasons why the influence of engineers has declined in local government; most are structural, some are organisational, occasionally personal issues arise but in this contributor's experience it is rarely, if ever, an 'abdication'.

Local government has gone through several decades of structural change. Water and highways agencies have ended; compulsory competitive tendering has externalised direct labour and professional staff alike; housing stock has been transferred to registered social landlords; public assets of all classes have been disposed of; and the powers that local government once possessed have been curtailed by successive governments.

These factors have slowly but steadily reduced the influence of engineers.

This is not to say that urban management is no longer important, rather the reverse, but the character of municipal

engineering has fundamentally changed. The activity is now divided into many individual specialities practised by professionals from a variety of backgrounds (Jenkinson, 2009).

The author is correct to suggest that training and formation need to change to meet these new circumstances. This is especially so as it can be seen that engineers are rarely appointed to a leadership role in government structures; the prominent exceptions merely prove the rule. Some would argue that many are ill-equipped to apply in the first place. However, the types of skill that are required for such roles are unlikely to arise from university, or even from an academy. It is long-term career mentoring that is most likely to be of benefit, something that tends to be dropped as soon as the professional review is completed. ICE should consider developing this approach if there is a real desire to ensure a rational management of the planet's resources.

### Author's reply

The often-heard frustration at the heart of the first contributor's comments was the source of the remark that 'the existing Institution must perhaps be wary of a repeat of Kendall's coffee house!' There has been movement by ICE, such as the appointments of president's apprentices and the continuing strong presence of the graduates' and students' committees. In spite of these innovations there are still widespread perceptions that younger engineers have little voice in ICE and that the industry is staidly old-fashioned. Greater efforts need to be made by ICE members to radically change those perceptions and, indeed, further improve the reality. There are many obstacles: senior members may be unable to clearly imagine what is needed and younger members are perhaps too deferential, fearing that they might jeopardise their professional careers. *New Civil Engineer* no longer professes to be 'the magazine of the ICE' and carries precious little news about what ICE is doing, so most members remain unaware of how ICE has changed.

The name 'civil engineer' is very unlikely to change. What *must* be changed is the general perception of what it means.

The author was employed in local government at a time when many traditional engineering posts were being filled by estate agents, planners and assorted others. In the minds of the local politicians these people were perceived as having greater empathy with the complex problems being created for the public sector whereas engineers were apparently only interested in hard engineering. That perception was undoubtedly wrong in many instances but it led to many engineer chief officers losing their traditional roles.

Whatever the extent of fragmentation of public services, someone, on behalf of the public, still has to make decisions on what these disparate services must achieve and how. These are matters which are unclear at this time (apart from 'greater efficiency', a euphemism for less cost). Such decisions, particularly the proper apportioning of the risks, ought at least to be strongly influenced by competent civil engineers. Again, ICE has made a start by championing a 'chief construction officer' to the government, but much more is needed.

All members, who *are* 'the Institution', must continue to improve its relevance, and to make the perceptions match the reality!

### REFERENCES

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