Where are the champions?

Chemistry lacks the easily articulated grand challenges associated with physics or biology, and it generally gets a rough ride in the mainstream media. All the more reason that it needs effective advocates and champions.

When the word 'chemistry' appears in the popular press, it often does so in a positive context. Alas, it usually has little to do with the scientific discipline that goes by the same name. In this sense, 'chemistry' is used to describe the somewhat intangible forces that result in successful relationships between two or more individuals — whether in terms of romance, sport, business and so on. The website 'chemistry.com' is not about science.

On the other hand, the word 'chemical' usually gets very bad press. Chemicals leak, spill and leach, before going on to poison and pollute. They form cocktails that you almost certainly wouldn't want to drink, and malevolent clouds that can ruin more than just your plans for a nice day in the garden. Chemicals are dumped, and — more nefariously — they can be used to make weapons and to wage war. It's fair to say that chemicals and, by implication, the science of chemistry, has a bit of an image problem in mainstream culture.

This negative perception of chemicals permeates through large sections of society and seems to influence how some consumer products are marketed. Perhaps the most stark example of this is a particular brand of compost that boldly proclaims to be '100% chemical free'. That certainly would be some kind of miracle. Examples such as this have even prompted the Royal Society of Chemistry to offer[1] a £1-million-prize to anyone who can provide them with a sample of a material that is chemical free.

Anyone reading this Editorial will not need to be told that the RSC's money is safe, but as chemists we should be concerned that such fundamental misconceptions of our subject crop up so readily in everyday life. And even when certain chemicals do good things, don't expect them to be called chemicals — new 'wonder drugs' are usually described as medicines rather than 'chemicals' or 'chemical compounds', and some materials used in environmental remediation are simply polymers, which we are told are not really chemicals[2]. All of this can upset chemists a little, especially on Twitter, where 'Angry Chemist' enjoys "ranting against ignorant anti-chemical propaganda especially from products labelled natural"[3].

The 'chemicals are bad' mantra is obviously not good for the public understanding of chemistry — it serves to diminish or obfuscate the incredibly important contributions that chemistry makes to our lives and could also lead to misunderstandings about what chemists actually do. This then begs the question of how best to counter unwarranted chemical scare stories? Practicalities aside, the ideal solution would be one of basic chemical education — of those who generate such stories (the media) and those who consume them (the public).

> Where's Captain Chemistry, clad in a T-shirt emblazoned with the boast 'Made from 100% chemicals'?

In 2006, the independent charitable trust Sense About Science produced a report[4] entitled *Making Sense of Chemical Stories* to serve as a guide to writers and presenters working in lifestyle media — which covers topics such as health, food and the environment — to explain the 'chemical realities of the world'. This document, produced in consultation with independent scientific experts, tackled some of the most prominent misconceptions about chemicals. These included the idea that an individual can lead a chemical-free life, and the notion that synthetic chemicals are dangerous whereas natural ones are not.

So, the Sense About Science approach shows how sensible chemical information can be made available to the media, but what about the public — how can they be convinced that chemicals (and chemistry) aren't always harmful things to be avoided, but are part and parcel of our everyday existence? Leaving aside traditional school education, why not try to find some chemistry champions, members of the community who have the skill and desire to reach out and show those beyond the borders of our field that what we do is interesting, important and exciting.

In some respects this is a little harder for chemistry than the other two basic scientific disciplines taught in school. Grand challenges in physics and biology are much easier to identify and sum up in a sentence or two. Physics sets out to unlock the secrets of the universe, and perhaps even come up with a theory of everything. Biology attempts to unravel the mysteries of life — and life is something we're all fairly heavily invested in. Chemistry...well, if you want to know what happens when you drop some Mentos in a bottle of coke, we've got you covered!

Obviously chemistry is about much much more than that last — somewhat tongue-in-cheek — example, and those of us in the chemistry community know that[5]. The challenge, however, is to make this clear to everyone else. Children that grow up wanting to be astronauts study physics, those that want to play around with ancient dinosaur DNA study biology. We now need chemistry role models and champions that inspire similar feelings about wanting to study chemistry. Where's Captain Chemistry, clad in a T-shirt emblazoned with the boast 'Made from 100% chemicals'?

Of course, there are some very worthy projects that have brought chemistry to the masses in an entertaining and informative manner, and two of these that have stood out in recent months are the Periodic Table of Videos[6] based at the University of Nottingham, and the BBC television series *Chemistry: A Volatile History*[7] fronted by Jim Al-Khalili. A professor of theoretical physics, Al-Khalili did a great job in explaining chemistry to a lay audience, but where are the chemists championing chemistry? With 2011 designated by UNESCO as the International Year of Chemistry[8], our community should use these examples as an inspiration for how to reach out and share its passion for chemistry with a wider audience. ❐

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