

Chemistry is fundamental for sustainability in the 21st century, says Harry Kroto **Education can challenge relentless decline**

RSC

The developed nations are easily recognised: they are the ones that have harnessed the innovative genius of scientists and engineers to provide abundant food, shelter, clothing, warmth, medicine and other necessities to survive.

Science professionals have also helped to provide many of the luxuries enjoyed today. The RSC's own Campaign for Chemistry includes activities aimed at maintaining standards of living.

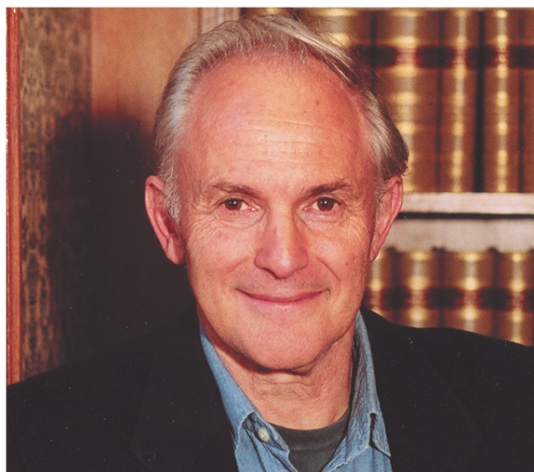
Tangible progress can be made by focusing on a few key issues, such as a commitment towards sustainable development. However we must also address the decline in popularity of studying chemistry and how we can revitalise its teaching.

Knowledge and responsibility

Chemists understand better than anyone else that the present rate of technology-driven dissipation of the Earth's resources cannot be sustained. This awareness and our part in the creation of many of the technologies mean that we have a responsibility to espouse and propagate the ethos of sustainability as the primary motor of future action.

Chemistry has contributed so much in the past and has even more to offer in the future. Indeed it should be the fundamental science for sustainability in the 21st century.

I prefix the term 'fundamental' to highlight chemistry's exciting promise for creating new, truly revolutionary sustainable technologies. I am, of course, aware that we cannot phase out, overnight, the plethora of endemic technologies that currently make negative contributions to sustainability. As a community however we can develop a concerted attitude aimed at replacing these technologies with new, fundamental ones, that contribute positively.



'Chemistry has already contributed much ... and has much more to offer'

The RSC is creating a group focused on sustainability issues. I am still optimistic (just!) that we can develop a sustainable global economy before it is too late but only if all of us, industrialists, politicians, engineers and scientists, farmers and fishermen make sustainability the priority.

Currently there is a cohort of sensitive young people who are apprehensive and disillusioned with the present worrying prognosis. By making sustainability the driving philosophy behind future innovation, that cohort could be encouraged to direct their enormous creative potential to solving the exciting problems that confront us and gain satisfaction from their contributions.

Hoist on its own petard

The 25 per cent drop in the number of undergraduate chemists over the past five years has the most serious implications not only for university chemistry departments but also for the UK's future. The chemical industries make a significant contribution to GNP. Chemistry is the most multidisciplinary launch pad into any career and not just in the sciences and medicine. The

chemistry community is thus hoist on its own petard as trained chemists are siphoned off into other areas.

The RSC is working with other UK science organisations to exhort the government to recognise that the present market-driven complacency over maintaining the flow of scientists, in particular chemists, is a recipe for disaster.

Pre-packaged education

The Internet may not be the answer to every problem but it does promise to revolutionise educational outreach. Pre-packaged educational teaching resources, created by the best educators, can be disseminated to teachers worldwide. Through its educational work, the RSC is setting up a searchable web-based database that will give teachers access to teaching materials. It is also developing some experimental outreach initiatives that the Vega Science Trust (www.vega.org.uk), of which I am a trustee, is testing. The initiative is supported by a Leverhulme Trust grant.

When combined with other resources, the Internet will help to improve teachers' skills in explaining the importance and fundamentals of chemistry. If students can in turn be excited by such inspiring goals as sustainable development and how they as scientists can help achieve this, then we can look forward to reversing the decline in chemistry undergraduate numbers.

For information about the RSC's Campaign for Chemistry, its Environment, Sustainability and Energy Forum, and its education activities, contact Neville Reed [reedn@rsc.org].

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