Should the 'literacy package' include science too?

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THREE HUNDRED and fifty years ago, a group of distinguished men gathered in London to hear a young Christopher Wren give a lecture on astronomy.

In the discussion that followed, they decided to form a society that would study and disseminate results from the new "experimental philosophy", an emerging discipline that studied the natural world using inventions such as the telescope and the microscope. Two years later, the Royal Society was born, adopting the motto *nullis in verba* ("take nobody's word for it") to signify the determination of its members to establish facts objectively from experiment.

The Royal Society went on to play a major part in the evolution of modern science, from the establishment of the scientific method (observation, hypothesis and experiment) to the facilitation of ground-breaking discoveries such as Newton's theory of gravity and Darwin's theory of evolution.

What would the founding members make of today's science? Robert Boyle would be astonished that the reality of his speculative "corpescules" had long been established (now known as atoms and molecules), while Isaac Newton would be astounded that his theories of motion and gravitation had been usurped by Einstein's theory of relativity. Christopher Wren would be amazed that modern astronomical measurements had led to the discovery that we live in an expanding universe that was once smaller than an atom.

But what would surprise the founding members most is that these, and other discoveries, remain the preserve of a few. Far from being an indispensable part of the human experience, science has remained a specialised subject understood by only a fraction of society.

Does it matter? No doubt historians complain of a lack of historical knowledge in society and French teachers of a lack of awareness of French literature. However, I think science is different, for two reasons.

First, many challenges facing modern society involve a basic understanding of science. Issues such as the safety of commercial nuclear power, the ethics of embryonic stem-cell research, or action on greenhouse gas emissions all demand a basic knowledge of scientific concepts, and how scientific facts are established. This latter is the more important point – an understanding of the built-in scepticism of the scientific method builds confidence in scientific discovery.

Instead, public discourse on important scientific issues is often dominated by media commentary that has little idea of the methods of science, and that fails to distinguish between informed and uninformed opinion (not to mention vested interests). For example, much of the current "debate" concerning the reality of human-induced global warming occurs not within science, but in the media – a public scepticism that takes little account of the robustness of modern scientific enquiry.

A second, and often overlooked, reason for a public understanding of science is that science is part of the human experience, just as history and music are. Not everyone may want to partake in the actual discovery of the workings of the natural world, but they deserve to know what has been discovered! This science-as-culture argument was first articulated by the physicist C P Snow when he realised that he could engage in literary discussion with friends in the humanities, while they knew nothing of his subject. Indeed, he felt that the general public was being cheated out of a scientific education.

This coincides with my own belief, and that of many scientists, that society has a right to know the discoveries of modern science. Indeed, I believe society also has a right to know how those discoveries were made, as the story of unfolding scientific discovery is an important part of human history.

So what is the solution? I suspect the answer lies in education. It is striking that when we talk of literacy, we mean a mastery of reading, writing and arithmetic. It could be argued that a basic knowledge of science should also be part of the package – and is about 300 years overdue.

In Ireland, children encounter some science in school at a very young age. However, by the time they leave school the vast majority have long opted out of scientific subjects, a pattern that is common in English-speaking countries. One reason may be that science subjects can be very demanding and students are compelled to choose between science and other subjects. Perhaps this should be changed so that all citizens can enjoy some knowledge of science, and of the scientific method. Most importantly, this knowledge would inform public discourse of significant societal issues such as potential climate change.

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