EDITORIAL

History in science

Is the history of science important enough to be taught or even occasionally discussed by teachers and students? Or is history something that ageing scientists are comfortable with (living in the past can be pleasantly sedative), while the young are clearly more concerned with the future. In our surroundings, wrestling with the problems of the present can sometimes be an overwhelming task, leaving little time for contemplating the past or the future. In many subjects in the sciences, the volume of information that needs to be transmitted to new students has increased enormously in the past fifty years. Teachers struggle to be coherent, comprehensive and correct even in post-graduate courses. Their task is not lightened by rigid syllabi, archaic examination systems and the diminishing quality of students entering science courses. Students now enroll for research degrees more poorly prepared than ever before, only to realize that they have entered areas of research, which are moving forward at a breathtaking pace worldwide. In areas like biology and medicine the progress is over such a broad front that new entrants to the field find that the battle to stay abreast is lost even before it has begun.

There is so much that is new that has to be assimilated in time spans that become shorter with each passing day. Looking back to logically trace the development of an area, thus appears to be a poor investment of time and effort. History, therefore does not seem to have an important place in the teaching of science today. Few teachers seem to echo Goethe's famous statement that 'the history of a science is the science itself'.

Scientific papers are invariably written in a sanitized style, in which failures and misinterpretations of data that are common in the course of research are not recorded. The false starts and false trails, that are explored before an even relatively minor research problem is satisfactorily addressed, are never described. Journals have a limited space, editors and referees have a charter to ensure economy of presentation and, of course, most readers are impatient. All of these factors ensure that most scientific papers are incomprehensible to the non-specialist (specialization today is rapidly becoming a case of 'knowing more and more about less and less'). Most papers are certainly unhelpful to students of the subject seeking to explore the origin and development of concepts and techniques. In their haste to provide encyclopaedic coverage of their fields, authors of books too treat historical development in cavalier fashion. Students thus, have only a very hazy view of the history of the fields in which they intend to do research. Balanced views of emerging areas of science are provided by reviews, which have today acquired enormous influence and importance, as witnessed by the phenomenal growth of review journals, focusing on current 'hot' topics. Unfortunately, most often, the average review provides only a round-up of the current literature with almost no reference to historical background of an area.

In reflecting on the relevance of an historical approach to teaching science we might do well to recall Maxwell's appeal to Ampere: 'If you have built up a perfect demonstration do not remove all traces of the scaffolding by which you have raised it'. Looking back can teach us the importance of being wrong. History can sometimes be difficult to write and historical accounts can be even more difficult to judge. In recent days the debate on the reconstitution of the Indian Council of Historical Research emphasizes that 'rewriting' history can be politically expedient. In science, of course, 'history' has been approached in a more detached and scholarly way, but the manner of chronicling events depends very much on the observer. There can be 'biased' and 'personalized' accounts (often very readable) in which the observers are also participants. James Watson's 'The Double Helix' belongs to this genre. At the other end of the spectrum are the more elaborate and well-documented treatments of a field: Robert Olby's 'Path to the Double Helix' is an example. In tracing the growth of a subject, historians of science tread a dangerous path, reminding us of the dictum that 'time blots out small merit while fattening big glory'. An historical approach to teaching a subject can often be inspira-
tional; which budding scientist can remain un stirred by tales of Galileo and the inquisition, a paranoid Newton dabbling in alchemy, the boy Faraday transforming himself into one of the great experimentalists of all time, Pasteur’s remarkable career which set the stage for microbiology, vaccinology and stereochemistry, the unmatched story of Ramanujan and his magic with numbers. Madam Curie’s legendary commitment which transformed a field and Raman’s move from the accountant general’s office to resurrect the Indian Association for the Cultivation of Science. The glamorous and much-told stories of the early days of quantum mechanics have never ceased to inspire young (and even ageing) physicists. Stories of people and discoveries convey a sense of excitement and challenge, providing an element of romanticism in science. In today’s highly competitive and ‘professional’ environment there seems little time and place for history and the retelling of famous stories in the classroom or on the pages of journals and textbooks. Divorced from the past, modern science may seem too sterile and purposeful to attract the dreamers amongst students. Unfortunately, it is the dreamers who will create the new science of tomorrow.

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