Comment

Microbiology education in 2001

Microbiology education in our schools, colleges and universities is in a state of rapid flux. We have moved on from regarding micro-organisms just as pathogens (plant or animal) and come to regard them as co-inhabitants of our environment with uses and benefits as well as threats. We have recognized through biotechnology that many micro-organisms and their products are commercially useful and can replace chemicals in some industrial processes to provide biological and pharmaceutical products more efficiently and cheaply. We have now entered the era of genetically modified micro-organisms which can be applied to a wider range of processes. The potential for the exploitation of fungi and bacteria for mankind's benefit has never been greater.

So how do we impart this excitement to students and the young people who will follow us?

School syllabuses recognize the part micro-organisms play in our lives, and teachers are increasingly aware of the interaction between microbiology and subjects such as immunology and molecular biology. This trend is to be encouraged and interdisciplinary co-operation promotes microbiology and shows biology can be studied in a modern integrated way. Part-time and continuing professional development also make a significant contribution to education later in careers.

In universities we have a problem in retaining and communicating our enthusiasm in the face of increasing numbers of students moving away from biological science, and indeed from science generally. The attractions of degrees in media, business, sports studies and computing are powerful and the perception by students that some courses may offer a better prospect of good employment and be less intellectually demanding is enough to swing the pendulum away from science, no matter that we may be turning out a generation of leisure centre managers.

Many departments of microbiology have lost their identities, being swallowed up in schools or divisions of (for example) biological sciences and the special nature of the subject has been eroded. To keep numbers up and achieve a more 'efficient' (what does that mean?) staff/student ratio, students are taught in larger numbers with those on other courses and this has exacerbated the loss of identity which they feel. Coupled with reductions in unit funding, this trend has set us new challenges in the last 10 years. Microbiology is above all a practical subject and the reduction in laboratory time does not help students in their eventual search for employment. Employers and sandwich year laboratories bemoan the reduction in students' ability to perform elementary tasks such as calculation of dilution factors or setting up a microscope, even though they may be thoroughly conversant with complex molecular biological concepts or immunological theory.

To reverse the swing away from our subject we must get the message across that the successes of the new 'sexy' subjects of molecular genetics, genomics and biotechnology are largely dependent on knowledge of the whole biology of micro-organisms. Multimedia and other innovations have contributed new ways of learning microbiology. Today's textbooks all have colour illustrations and many include CD-ROM packages. The internet provides a wealth of information and also teaches students discrimination in what they read, since not all web-based information is wholly accurate. Professional microbiologists outside academia are often willing to collaborate in training schemes and this can result in future employment prospects for the right candidates.

The very real research/teaching divide within the profession needs to be recognized and removed. Too many researchers still regard teaching as something which should be done by others. No one would argue that well-funded researchers should be forced to undertake 300 hours student contact a year, but there is a strong case for students learning directly from them if we are to produce graduates with up-to-date skills and approaches to science. Similarly teachers should seek to be involved in research and promotion of others' work. The excellent ideas we see in some of the Education Development Fund applications are testament to the ingenuity and originality of teachers which should be encouraged. We should see ourselves as microbiologists, not divided into researchers and teachers; most of us came into the trade because we liked the idea of working with micro-organisms – we should now view those who learn from us as our apprentices and we must help them develop the same interest and fascination that we had.

None of this will help however unless the HE science sector as a whole is recognized for what it tries to do, which is to stimulate students to question, to investigate, to innovate and thus contribute to knowledge and prosperity. As teachers we have to be at the beginning of that process. We may have no difficulty in communicating enthusiasm, but we need adequate support from good university management working in concert with its staff, and proper resourcing by Government. We will then see a recovery in morale in HE and as microbiologists we will be able to provide for our students the experience to which they are entitled. Modern microbiology is a wide-ranging, vibrant and exciting subject which offers splendid careers; our task is to get that message over to students and the public, to ensure that it continues to lead and underpin so many other areas of science.

● ***Peter Wyn-Jones, Convener of the SGM Education Group***

I am grateful to members of the Education Group Committee for helpful comments.

● Please note that views expressed in *Comment* do not necessarily reflect official policy of the SGM Council.