

In praise of open software

Freely available software, developed by researchers, is good for science and keeps commercial companies on their toes. In an era of quasi-monopolies, research institutions should encourage it.

Imagine how the web might look today had it been invented by Microsoft and made proprietary, rather than at the European Laboratory for Particle Physics (CERN), where it was made available free. Scientists tinkering with computers to create tools for their research for no profit have underpinned the computer revolution. The bounds of supercomputing are being pushed back by hugely demanding challenges, such as protein folding and the cosmos; many of the pioneers of the Internet are not Internet millionaires, but are still labouring in their laboratories.

The profit motive, and the investments that go with it, are often essential. The scrappy, early 'Mosaic' browser designed at the National Center for Supercomputing Applications at the University of Illinois only took off when some of the scientists who invented it went on to set up Netscape. But the abuse of commercial monopolies is also too evident, with much of the world having been held hostage to the dismal operating system DOS for more than a decade.

This issue — providing equitable access to all scientists and not just the richest — is about to become critical as companies rush to build bioinformatic tools for genomics. Tools that add value to genome data are to be welcomed, but as the licensing strategy being adopted by Celera Genomics becomes clear (see page 231), it gives new grounds for wariness. Unfortunately, restrictive material-transfer agreements are also becoming the rule even in publicly funded institutions (see page 236). While academic research centres are an important cradle for industrial development, it is crucial that the not-for-profit motive should be respected when the needs of research communities are best served in this way.

The high cost of some journals has attracted enormous attention over the past few years, whereas the high cost of software and the often

exorbitant licence charges have not. Most scientific software is proprietary, and beyond the reach of many poorer parts of the scientific community worldwide. All the more reason to be grateful, therefore, for the continuation of the open spirit in the tradition of Internet pioneers. Witness the group of Californian scientists developing sophisticated 'freeware' for DNA chip technology (see page 234). The software, which users say compares favourably with costly commercial software, can be downloaded from the web. Another example: scientists at the Max Planck Institute in Potsdam have made freely available a vast suite of plug-and-play tools, 'Cactus', that allows scientists from any discipline to use supercomputers without needing to know advanced computing techniques. A Japanese scientist is giving away E-Cell, a package that simulates basic cell processes. And so on.

The open-source movement has found its apogee in the Linux operating system developed by Linus Benedict Torvalds (see <http://www.cs.helsinki.fi/~torvalds>) as a 'hobby' — which IBM last week decided to put at the core of its hardware plans. Because the code is not proprietary, it is being built on and debugged by an army of amateur developers worldwide, many of them academic scientists.

In short, amateur software developers are playing a key role in keeping systems open. But such activities need to be encouraged and professionalized by academic institutions; plans in France to create a research centre to provide bioinformatic tools for industrial and academic researchers build on the tradition of the Centre d'Etude du Polymorphisme Humain, the US National Center for Biotechnology Information and the European Bioinformatics Institute. At a time when Microsoft looks as if it may be broken up (shades of AT&T) into 'Baby Bills', it would be ironic if science, and biology in particular, became a victim of new monopolies. ■

A step up for a few postdocs

One initiative in one Dutch institute, born out of necessity, provides an example to follow.

If there is one thing postdoctoral and contract researchers should know by now, it is that if they don't look after their collective interests, no one else will. Eminent academic panels and learned societies frequently speak up on their behalf, but can come to conflicting conclusions (see attempts in recent years by various panels to address the embarrassing surplus of postdocs in the life sciences in the United States). Research funding agencies and publicly funded employers seek to set new standards, but progress in improving status and rewards is slow and, ultimately, can only come by collective coherence, sustained campaigning and learning from the examples of successful initiatives. One such initiative may therefore be worth noting.

A survey of postdoctoral researchers by *Nature* and the European Science Foundation indicated that the Netherlands is a good place to be a postdoc as far as laboratory conditions are concerned (see *Nature* 397, 640–641; 1999). But a recent meeting of postdocs at a major Dutch research institute, the Netherlands Cancer Institute (NKI), highlighted their profound frustration at their lack of research independence and poor career progress and development. The fact that

postdocs took time out to collectively argue for better conditions, and that staff listened and acted, is unusual and commendable.

Some argue that the institute is simply fighting a rearguard action because of growing recruitment difficulties (see page 235). It is true that changes to employment law preventing institutes from awarding repeated contracts to an individual have strained the Dutch postdoc system and are galling to postdocs themselves. But postdocs often forget that what may seem expedient in the short term is not necessarily good in the longer term. A system of endless short-term contracts that lead nowhere may appear to offer a 'holding position' until a permanent job comes along, but, for most, such a system leads nowhere.

What more postdocs should be arguing for — a career structure — is just what some postdocs at the NKI asked for and are getting. Allowing postdocs independence by letting them apply for funding in their own right, and to take it with them if they move, is good for individual postdocs and good for the science. Other institutions should take up the challenge of providing for postdocs, and not simply wait until signs of discontent or serious recruitment problems develop. ■