Names not to be forgotten

It is usually honourable and seldom harmful to attach a name or two to a discovery. But an anarchic system of nomenclature is never helpful.

NOBODY would begrudge Beethoven his fifth, Maxwell his equations or Student his *t*-test. So why should Hardy and Zuckerman not have their virus — the Hardy–Zuckerman 2 feline sarcoma virus described and christened on page 825 of this issue.

Not that everyone would wish to have a tumour virus named after himself or herself, especially one that kills cats. There is, however, a long though erratic tradition of calling tumour viruses after those who first isolated them, beginning with Peyton Rous. The transmissible agent of chicken sarcomas that he described in 1911 came to be known as the Rous sarcoma virus.

The attachment of the discoverer's name to a new beast has, of course, a long history to it, some of it is very respectable and some not so. Many an explorer and collector was by no means unhappy to have his name associated with new specimens he brought home. Some attachments remain, commonly in latinized form (okapi — *Okapia johnstoni*), occasionally as written (Leach's petrel — *Oceanodroma leucorhoa*) and rarely both (Baird's sandpiper — *Calidris bairdii*). Much less glamorous, for the amateur at least, is merely to be the author — the person alone responsible both for the name and the diagnostic description — of a new species (pendulous-flowered helleborine — *Epipactis phyllanthes* G.E. Smith).

These days new mammals are hard to come by and it is a good year when more than one new species of bird is discovered. One alternative is to discover a new comet, customarily named after its original observers. Only a few weeks ago, that convention bore forth Comet IRAS–Araki–Alcock, lamentably giving the Infra Red Astronomical Satellite (IRAS) equal status to George Alcock, an amateur British astronomer, and Genichi Araki, a Japanese schoolteacher. IRAS first picked up what, in retrospect, was the new comet on 25 April. Araki, a Japanese schoolteacher and Alcock, an amateur British astronomer renowned for having memorized in detail much of the night sky, spotted the comet within hours of each other on the night of 3 May.

Another but much less reliable way to posterity for the scientist is through the invention of a technique. The past few years of molecular biology have brought with them, and to a large extent depended upon, the rapid DNA sequencing techniques invented on the one hand by F. Sanger, S. Nicklen and A.R. Coulsen and on the other by A.M. Maxam and W. Gilbert and now universally referred to as the Sanger and Maxam–Gilbert methods. There is also the Southern blotting technique, invented by E. Southern of the University of Edinburgh to identify the presence of defined fragments of DNA within the mixture generated by cutting up a continuous sequence with enzymes. "Blotting" refers to the step whereby an agarose gel, on which the fragments of DNA have been electrophoretically sorted by size, is blotted with a sheet of paper in order to transfer the fragments to a material of appropriate properties for the next step in the procedure. (When the Southern procedure was adapted to suit RNA instead of DNA, some wag coined it Northern blotting, a term that has also stuck.)

Other molecular biologists have their names tagged to fragments of DNA (Okazaki fragments) or particular regulatory sequences of DNA (the Shine–Dalgarno and Pribnow "boxes"). Less obviously the names of H. Bernstein and (Stanford's) S. Cohen are perpetuated — the former, in translation from the German, as the "amber" codon in RNA that terminates protein synthesis, the latter as initials in the legally and biotechnologically important pSC101 plasmid.

Although the vogue now is for terms such as carpet-layer's knee and the sunglass syndrome, pathologists have often left their names with a new disease or syndrome they were the first to describe. It is from that tradition of pathology, which has given us such terms as Kaposi's sarcoma and Burkitt's lymphoma, that the naming of tumour viruses arose. After Rous had published his paper on "A sarcoma of the fowl transmissible by an agent separable from the tumour cells", the sarcomas came to be referred to as Rous sarcomas. Naturally, therefore, when the transmissible agent was identified as a virus, it became the Rous sarcoma virus.

That set a trend but never a habit. Typically what would happen was that a new virus would be described without being named. For example, when J.J. Harvey described how the plasma of a rat with viral leukaemia when injected into mice gives rise to sarcomas, she did no more than call the virus responsible an unidentified sarcoma virus, in part because she was uncertain that it was distinct from a known variant of Rous sarcoma virus. Later, when it became clear that the virus was indeed new, it became known as the Harvey sarcoma virus (currently of great interest in connection with human oncogenes — see page 775).

The Kirsten sarcoma virus, the Abelson murine leukaemia virus and a host of others acquired their names in the same way. More recently, like W.D. Hardy and E.E. Zuckerman on page 825, some of those who have discovered a new virus have cast aside modesty and donated their names to it rather than wait to see whether others do it for them.

There is no rule that proclaims that tumour viruses should be named after their discoverers. It is not even done widely enough to be called a convention. The acute avian leukaemia viruses never go by their discoverers' names, although there is one, OK10, where OK alludes to N. Okerblom, in whose laboratory it was 10th in a series. The three other members of the group into which OK10 falls are MC29 (29th in a laboratory series of viruses that caused myelocytomatosis), CMII (2nd in a different laboratory's series of viruses that cause myelocytomatosis) and MH2 (the Mill Hill no.2 isolate).

By contrast with the unenlightening results of that system, in which some arbitrary laboratory code determines the virus's name another group of acute avian leukaemia virus, the avian erythroblastosis viruses, tend to be known by the acronym AEV followed by the laboratory code, for example AEV-ES4.

Another alternative is to use the name of the town in which the virus was first isolated. Hence there is the Prague strain Rous sarcoma virus and the Bratislava 77 strain avian sarcoma virus; however, there are also the American discoverer-named Schmidt–Ruppin strain Rous sarcoma virus and the Bryan strain Rous sarcoma virus.

So anarchic a nomenclature "system" is bound to confuse the newcomer or interested outsider. Some kind of rational system of nomenclature is overdue. Perhaps the most sensible is an acronym for the virus type followed by a designation of the isolate by place (and number if necessary). It would certainly be possible to use the discoverer's name instead of the place although, in these days of team work, that would be to encourage internal strife and compound names. Perhaps those who discover a new virus should be honoured in its name but the honour is largely negated when the name is self-promoted.

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