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Editorial

It was recently reported that a policeman repeatedly faxed the same sheet of paper, because, as he thought, the machine kept rejecting it. I know personally of a scientist who worked for many years in pharmaceutical research (not in the Pharmaceutical Development Department), without a day's illness. Then that rare day eventually arrived and he was prescribed the medication in a capsule; not having seen one before, he broke it open, swallowed the contents and washed it down with water, while thinking what a silly way to package the drug. A few years ago, there was a spate of reports of new-born babies being fed cow's milk, because the mothers knew no better.

These little stories are not unconnected. They all involve people behaving quite rationally, even intelligently as far as they had information on the particular subject, while at the same time another person more directly experienced would assume it was common knowledge that fax machines don't actually send paper down telephone lines, capsules are meant to be swallowed whole, and rich milk from modern dairy herds is not the same as relatively thin milk that nature designs for new-born humans. This is one of those problems in education and information dissemination that would not have been out of place in Joseph Heller's Catch 22; those who assume certain things are common knowledge are not prompted to any explanations, and those who don't recognize a problem don't ask for information.

The foregoing is not without relevance to writing research papers for learned journals such as the *Journal of Pharmacy and Pharmacology*. Every paper has a section on materials and methods, and, at least at the typescript stage, different authors may treat this section in different ways. Some authors will slavishly copy out chunks of their previous papers (and this sometimes in a series of consecutive papers destined for the same issue of the journal); others will blithely give minimal details of their methods and will spray their text with undefined acronyms, assuming that everyone knows the everyday terms of the author's own laboratory. The overall principle for the amount of detail given in a scientific paper is that a reasonably informed person, working in the same field and with access to the same equipment should be able to repeat the experiment using the information contained in the material and methods section. In a very specialized journal, the methods section may not need such detail, with all the readers of the journal being very familiar with the methodology of all the papers in the journal. In a journal which spans quite a wide field, as this one does, the amount of detail required may vary depending on the main thrust of the paper. Thus, if the thrust of the paper was an analytical method, then an experienced gas chromatographer would not need to be told that the temperature of his column must be closely controlled, but he may need to know which particular manufacturer's column material was used; if the thrust of the paper was the pharmacokinetic analysis of data obtained using a gas chromatographic method, then the column details would be less relevant and certainly wasteful of space. This waste of space in a journal becomes particularly evident when a single straightforward finding may often take several pages to communicate because of the perceived need to give all experimental details and sources of every laboratory chemical. Apart from being wasteful, the overall effect can be misleading—in a six-page paper on the kinetics of a new drug, for example, the interested reader will expect to find more than just the half-life, and will have wasted his time (and money, sometimes) in obtaining a reprint that tells him more about sources of ultra-pure solvents than he was ever interested in.

The Journal tries to apply the guidelines of reasonableness as mentioned above, in editing out or asking for more details in the materials and methods sections. At the same time it certainly helps if the author has paid attention to such matters before he sends in the paper—particularly if he has just run an old text through his word processor with the find-and-replace facility working overtime. We also depend on referees, bearing in mind the general nature of the Journal, to point out over-elaborated or deficient methodology, as it is the fellow expert who is in the best position to judge this. A particular case in point is the amount of detail on buffers and composition of the fluids in organ baths; these are given in detail in most pharmacology papers, even where expert is speaking to expert. Is this necessary? Apparently so. A minute difference in the composition can dramatically affect the pharmacological result, and when laboratories disagree, this detail may be the key to tracking down discrepancies. It still seems necessary, even for standard procedures, using the same tissues and the same drugs, to set up the same controls for every pharmacological experiment.

There is another stage to this chain of information in carrying out scientific research in this last decade of the 20th century; what if the author himself does not know, has not been told, a vital piece of information? With so much to know, is it possible to make sure children in school, students at university, post-graduates in research, and even professors in their prime, actually know all they should to appreciate the full validity of their work. A lot of faith may need to be placed in those black boxes. There are very good reasons for giving details when the equipment itself may influence the finding, as opposed to informing the interested reader where it can be obtained, but sometimes the authors may unconsciously reveal that they don't quite trust some of the goings-on inside their microprocessors. Why should it be thought necessary, for example, to mention that statistics were calculated on an Apple, rather than an IBM or even a pocket calculator?

It was Newton who said something to the effect of increasing knowledge by standing on the shoulders of giants. Newton was being modest. More than ever we need scientists like Newton who know which shoulders to stand on.

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