What do we do with reference materials and PT schemes?

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This is the first column in a new series for *Spectroscopy Europe*. I introduced the Column Editor, Peter Jenks, in the Editorial in the last issue, but it will do no harm to repeat this for those who may have missed it! Peter is an independent consultant, specialising in analytical quality, new business development and the commercial consequences of regulation. He has worked for LGC in the UK and Promochem in Germany. Peter is involved with a number of international activities aimed at improving chemical metrology, including the BERM series of meetings and various cooperation projects with Dutch, Canadian and American teams. He has published a number of papers on the use of Reference Materials and coedited *Reference Materials for Chemical Analysis*, published by Wiley-VCH in 2000. He is the Editor of the *RM report*, a new newsletter, which starts publication this March.

Reference materials and proficiency testing schemes (RM&PT) have been with us for many years. Reference materials first appeared about 100 years ago when the US National Bureau of Standards, now NIST, produced metal samples to help the iron and steel industry produce more reproducible and reliable steels. At about the same time, the main Pharmacopeia of the world started to make available reference substances, to be used together with the analytical monographs, to control better drugs and medicines sold to the public.

For the first 50 or so years, RM&PT were not used by most analytical chemists, probably because the analysts employed wet chemistry techniques that are now considered to be primary methods. It was the development of routine automated techniques, in the clinical chemistry arena in the early 1970s, that produced the need for daily within- and between-batch quality control. The early machines, such as the legendary Technicon Auto Analyser™, were capable of a high workload, but results tended to drift. So, QC samples were introduced and labs got together to compare results using the same blind samples. Nycomed of Norway was one of the first companies to produce properly certified Clinical Reference Materials. In the UK Professor Tom Whitehead's team at the Wolfson Laboratories in Birmingham were instrumental in setting up a properly structured PT programme, then known as "NEQAS": National External Quality Assessment. It had become clear to clinical chemists that the proper coordinated use of RM&PT was the key to good analytical data.

Industrial accidents and a growing green movement in the late 1970s together changed the face of analytical chemistry: the analysis of heavy metals, pesticides, dioxins and PCBs in difficult matrices became a high priority, there was pressure to reduce detection levels and make data produced in differing laboratories comparable. Analytical instruments became more complex and the new Personal Computers from IBM were coupled up to the instruments. By the middle of the 1980s analytical chemistry was like clinical chemistry ten years earlier: systemised. From then on the use of RM&PT became a regular part of most analytical chemistry labs, pushed by the need to control the new challenging environmental analytical techniques better and pulled by ISO 9000, TQM and laboratory accreditation.

At the start of the new millennium the use of RM&PT may be routine, but many analysts are not really sure that they use RMs and PT optimally. There have been a number of surveys over the last 15 years, mostly intended to find out what the many producers are doing and the CRMs and RMs people wish they could have. In the mid 1990s the UK Laboratory of the Government Chemist, now LGC (Teddington) Limited, conducted an in-depth survey of UK industry needs. In 1998 the EC funded a wider survey, the results were published as Reference Materials in Europe: an enquiry into their use and prospects.[1] The main conclusion was that "the use and utility of reference materials are insufficiently known". This result caused concern and led, in 2000, to the EC asking PriceWaterhouseCoopers to carry out a survey on the use of certified reference materials in Europe. The project is to evaluate RTD and development strategies for the Competitive and Sustainable Growth Programme of the 5th Framework Programme by Directorate General Research. More information is available from www.certifiedreferencematerial.org, the web site set up by PWC for the project. Results are expected during mid to late 2002, but it is unclear how much will be revealed about the state-of-the-art today. As in previous investigations there were few questions about the routine use of RMs and nothing about PT. There were only one or two questions about how users interact with producers and suppliers of RMs and PT or where they find out about RMs and how to use them.

The commercial production of RM&PT has developed rapidly to meet the market need. Two commercial producers of RM&PT sought to understand properly what people do with RM&PT today, to help them better understand their customer's needs. They commissioned an independent report on the "state-of-the-art". A questionnaire is being sent out to many commercial and industrial analytical laboratories in the UK, Germany, France, Scandinavia and North America during the first part of 2002. The results will be distilled into a paper, but more importantly the detailed data will be published early in 2003 as a multi-client report.

If you would like to contribute to the survey, please visit www.rmreport.com and click on the link to the "RM/PT Survey". The results will be the first objective report on the "state-of-the-art" and will help all producers of RM&PT plan for the future.

Reference

1. Ph. Quevauviller, *TRAC* **18(2),** 76–85 (1999).