



## Eurachem's 25th Anniversary: Two members' perspective<sup>1</sup>

Alex Williams, Chairman Eurachem WG on Uncertainty and Traceability

Paul De Bièvre, Chairman Eurachem 1993 -95

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Eurachem was founded 25 years ago. Its prime aim, as was set out in the MoU, signed by its members, was to help establish a system of international traceability for chemical analysis. At that time there was little international activity in this topic or in the broader activities that could be classified as metrology in chemistry (MiC), in fact the concept "metrology in chemistry" was hardly in use; GUM [1] had not yet been published, but there had been a lot activity on the evaluation of uncertainty in the higher echelons of physical measurements following the publication of recommendations of the BIPM working party on "Expression of Measurement Uncertainties" in 1980. This way of evaluating and reporting uncertainty had also percolated down to other areas of physical measurement but had attracted little or no attention by analytical chemists. As a matter of fact, the CIPM only started to take interest in chemical measurement in the late eighties.

The GUM was published in 1993 based on these BIPM recommendations and it is such an important landmark in the development metrology that it is worth repeating its basic principles and the changes these engendered. Previously most of the discussion and reporting of accuracy had been based on the concept of a "true value" and random and systematic errors. Since the true value is unknown and unknowable and systematic errors are difficult if not impossible to evaluate, accuracy statements were mainly based on measurement repeatability or in some cases reproducibility. GUM changed all that, as is stated in the introduction to Annex D "the concept of uncertainty in this guide is based on the measurement result and its uncertainty rather than on the concepts "true value" and error"

GUM found fairly rapid adoption for physical measurements but had received very little attention in chemical measurements before the publication of the first Eurachem/Citac guide in 1995, after which, together with pressure from the accreditation bodies, uncertainty evaluation became common practice in chemical measurements as is exemplified by its use in a large number of articles in ACQUAL.

It is strange that uncertainty evaluation was the first step in applying MiC principles, rather than establishment of traceability of measurement results, particularly since it was a primary aim of Eurachem. A workshop on "Traceability and Comparability" was held at CBNM (later IRMM) in November 1992, but it was a number of years, with much discussion and many papers [2] before the first real concepts started to be developed on how to establish traceability and the Eurachem/Citac guide was not published until 2003.

The solution turned out to be very similar to that for physical measurements i.e. establishment of traceability for all of the measured values of quantities that are in the equation for the calculation of the value of the measurand plus traceability for all of quantity values specified in the measurement procedure that do not appear directly in the measurement equation.

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