

“President Bush believes policy should be made with the best and most complete information”. Although ‘information’ does not necessarily mean ‘evidence’, that speech remains historically significant as an early instance of the closer relationship between science, society and policy that we know today. (Chris Mooney’s 2005 *The Republican War on Science* (Basic Books) offers a very different interpretation of the events surrounding the UCS declaration.)

Marburger’s policy comfort zone was clearly the meticulous analysis of the science and innovation ecosystem to better inform the appropriations process. His call for a new “science of science policy” — defining the metrics for evaluating the inputs and outputs of a public science system — is an important legacy that has helped to embed the concept in the government vernacular. That powerful focus on appropriations might have been a strategic way to promote evidence-informed public policy more broadly; but Marburger does not make that claim. It is one thing to support the production of evidence, and quite another to help it to find its way to the corridors of policy. Perhaps Marburger’s contribution was in supporting the supply of scientific knowledge, without concerning himself with the more complex business of developing the government’s appetite for its systematic use.

Science Policy Up Close leaves the impression that Marburger might have had more to say had he been able to finish the book himself. Only the concluding essay offers a hint of his thoughts about the broader role of science in public policy and what he perceived as science’s lack of privilege in the seat of US governance.

More than a decade after the UCS declaration, the favoured tactic for dealing with ‘inconvenient truths’ is perhaps less often about discrediting the science, and more often about acknowledging the evidence and placing it among the many legitimate inputs into policy and decision-making. But there is some way to go: although the science-policy nexus is maturing and becoming more nuanced, the challenges and loneliness of intermediary roles such as Marburger’s remain. ■

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HISTORY OF CHEMISTRY

Words into gold

Philip Ball finds much wrestling with ideas in alchemists’ scribbled-over texts.

The sixteenth-century physician and alchemist Paracelsus claimed, “Not even a dog killer can learn his trade from books, but only from experience.” As later ‘experimental philosophers’ turned alchemy into chemistry, they retained this affectation: in the seventeenth century, Robert Boyle is said to have claimed that he had learnt “more from men, real experiments, and his laboratory ... than from books”.

Such comments seem to imply that alchemy and the transitional discipline of ‘chymistry’ were all about bench-top graft, in contrast to the medieval tradition of seeking knowledge in the library. Yet in most paintings of alchemists at work in the sixteenth and seventeenth centuries, books are ostentatiously on show. Apparatus lies unheeded or broken while the alchemist pores over a text, papers sometimes cascading in comic profusion from desk to floor. In these images, books matter very much indeed: they seem to be where the real secrets lie.

This vexed relationship is examined in *Books of Secrets*, an exhibition at the Chemical Heritage Foundation (CHF) in Philadelphia, Pennsylvania. Juxtaposing fifteenth-century alchemical books and manuscripts recently acquired by the CHF with its extensive collection of paintings of alchemists at their labours, the exhibition explores this early literature of proto-science, and what it was for.

Alchemical books varied significantly. Some were esoteric treatises, all cryptic diagrams and encoded instructions for conducting ‘rubification’ and other chemical procedures. Others were cheaply printed or hastily copied compilations of miscellaneous recipes for dyes, soaps and medicines. Both were apt to be marketed as ‘books of secrets’. The term seems to promise forbidden, mystical insights, but could also simply mean tricks of the trade.

The new acquisitions, originally part of the Bibliotheca Philosophica Hermetica in Amsterdam, include both

Books of Secrets: Writing and Reading Alchemy
Chemical Heritage Foundation, Philadelphia, Pennsylvania.
Until 4 September.



This alchemical manual may have become soot-smearred over a furnace.

handwritten and printed documents, some attributed (often spuriously) to famous alchemists including Raymond Lull and Petrus Bonus. They reveal the character and functions of the literary culture of nascent chemical science from the Renaissance to the early Enlightenment.

The books were evidently well used. The pages of one fifteenth-century compilation arrived covered in dirt — or perhaps soot, from being read over a smoky furnace. The CHF’s curator of rare books, James Voelkel, persuaded conservator Rebecca Smyrl to avoid cleaning the pages: the ‘dirt’ may be a remnant of experiments. “It could be something someone was trying to turn into gold,” says Smyrl.

To peruse these books is to glimpse a lively dialogue between author and reader. Despite the volumes’ costliness, some have words or passages crossed out or altered. In one sixteenth-century handwritten work, comments are squeezed into every corner of the margins: it is as much lab notebook as reference source.

On this evidence, the painters had it right, even if their depictions of alchemists often owed more to convention than observation. This band of proto-scientists engaged intimately with the words on the page. The text was not sacred, but it was indispensable. ■

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