was the first Nobel awarded to work done at the new biotechnology companies. The book ends with a consideration of whether or not PCR is a revolution (as it is often called in the journals). Mullis thinks not. He says, and Rabinow agrees, that it is not a political or a scientific revolution (there was no paradigm shift). But Rabinow disagrees with Mullis' claim that it was "business as usual exploring genes" for six reasons (these can be found on p. 168). The most important of these can be summed up in Rabinow's use of Lévi-Strauss' concept of *bricolage*. Mullis used the "diverse skills and diverse resources" on hand at Cetus to create a new tool in an area for which he was not trained.

The book is a clearly-written account that does not oversimplify the science, but does not let the technical considerations bog down the text, either. It has much to recommend it to those interested in philosophical issues in chemistry. First, there are the broad questions mentioned above about the actual practice of scientists. Secondly, the book points out the tensions between the academy and industry in terms of prestige and grant money. Through the interviews, we see how some of the scientists trained in chemistry or biochemistry in the 60s (*e.g.* Mullis, Gelfand, White, and Fildes) ended up at Cetus working on the biotechnology projects. Lastly, as I mentioned above, the ontological status of scientific discoveries is addressed. How this question interacts with questions of patents, money, and Nobel prizes is something worth thinking about long after you have finished reading Rabinow's book. My main complaint with *Making PCR* is that the text has no index.

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SECOND ISPC CONFERENCE

Cambridge, U.K., August 3-7, 1998

Which other place could have been more suitable for the Second ISPC Conference on the Philosophy of Chemistry than Sidney Sussex College at Cambridge, United Kingdom? There are only few doubts that Sidney Sussex is the college where one of the world's most famous chemists and masters of (what Sir Arthur Conan Doyle called) deduction, Sherlock Holmes, did his first promising steps into the world of science. The very world of the science of stuff changes was the subject of this conference of the International Society of the Philosophy of Chemistry, held from 3 to 7 August.

About 20 participants from six countries attended two lecture sessions with 12 oral presentations and a business meeting. KLAUS RUTHENBERG (Coburg University of Applied Sciences, Germany) spoke about "Philosophy and Alchemy". He pointed out that Alchemy has been closer to natural philosophy than modern chemistry is. Referring to some modern attempts to clarify the interrelations between alchemy, chemistry, and philosophy – particularly those of Theobald, Geiseler, and Liedtke – he discussed peculiarities of chemistry and alchemy with regard to explanatory approaches of the neglect of chemical issues in philosophy (of science). HEINRICH ZOLLINGER (Federal Institute of Technology, Zürich, Switzerland) gave a talk on "Logic, Psychology and Serendipity of Scientific Discoveries: a Case Study in Contemporary Chemistry". Discussing the development of reaction mechanisms for nucleophilic substitution on diazo salts – in which he has been involved personally – he stressed that chemistry consists of logic and intuition. He used the terminology of Thomas Kuhn (e.g. 'normal science', 'crisis') to interpret the historical example and claimed that chemists should know more about the philosophical basis of their own science. In his contribution "Meaning and Misunderstanding: Translation

HYLE, Vol. 4 (1998), 169-170.

and Interpretation of Pliny's Iron/Gallnut reaction", TONY EDMONDS (University of Loughborough, UK) presented the results of a thorough historical study on the alterations and shifts towards a description of the chemical process involved. In his conclusion, he reminded the scientific community of the problems one might run into referring to resources other than primary. Cambridge alumnus and organizer of the conference, MICHAEL AKEROYD (Bradford & Ilkley College, UK) gave a talk on "Fuzzy Reasoning in Physical Organic Chemistry". His main claim was that in (physical organic) chemistry the use of non-classical (fuzzy) logic rather than that of classical logic is typical. ERIC SCERRI (Purdue University, USA) specified the announced title "The Metaphysics of Chemistry" into "Naive Realism, Reduction, and the Intermediate Position of Chemistry". Summarizing the results of his research on the Periodic Table and reviewing Friedrich Paneth's view on simple and basic substances, he concluded that chemistry has an intermediate position between realism and reductionism. JOHN GREEN (University College, London, UK) read a paper on "Ingold's 'Mesomerism', Pauling's 'Resonance' and the Soviet Chemical Controversy", in which he told the story of the rejection of an ingenious theory by the protagonists of a stubborn, inflexible, and state-governed 'dialectical materialistic' philosophy. The contribution of DAVIS BAIRD (University of South Carolina, USA) was entitled "Chemistry and Reduction in the Light of Instruments". It was concerned with the distinction between the ideal world of theoreticians, on the one hand, and the 'Thingy World' of instrumental chemists, on the other. According to the speaker, both worlds are essential for the sciences. DANIEL ROTHBART (George Mason University, USA) asked the question "Are Chemical Instruments driven by Nature or Nurture?". He gave a systematical overview on the status of experimental phenomena, and described instruments as knowledge-producing technologies giving power to scientists. As example he chose IR/Raman spectrometry. The question "How constrained is the emergence of Novel Dynamic Coherence in far-from-equilibrium systems?" was the title of the paper given by JOSEPH EARLEY (Georgetown University, USA). He reflected on the dialectics of 'the many and the one' referring to dynamic structures in oscillating reactions. ARIE LEEGWATER (Calvin College, USA) gave a talk on "Linus Pauling's Methodology and the Development of the Chemical Bond". He sketched the history of Pauling's pertinent contributions and showed that the latter considered chemistry as being governed by rules. EVA ZIELONACKA-LIS (University of Poznan, Poland) referred to a classical topic in philosophy of science: "Some Remarks on the Specificity of Scientific Explanation in Chemistry". Discussing Salmon's model of scientific explanation, she came to the conclusion that it does not entirely fit explanations of chemical issues such as compounds and reactions. REIN VIHALEMM (University of Tartu, Estonia) presented a paper entitled "An Aspect of the Relationship between Physics and Chemistry: When did Chemistry become a quantitative science?". Sketching the history of thoughts of Boyle, Stahl, and Lavoisier, he concluded that only the atomic-molecular theory provided reasonable success for quantitative chemistry.

All contributions were vividly discussed, some of them even during the obligatory punting trip on the river Cam. During the business meeting, the implementation of a course on philosophy of chemistry for colleges and universities was discussed. Thanks to the local organizer, Michael Akeroyd, the Cambridge conference was indeed another success. The University of South Carolina will be the venue of the next ISPC conference in August 1999.

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