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EDITORIAL 11

In a previous issue Roger Strand began to lay the foundations for a philosophy of biochemistry. The present issue opens with another article on this theme by Klaus Jacob a biochemical researcher and educator from the University of Exeter in England. In fact Jacob even takes up one of the main themes in the earlier Strand article, namely the question of *in vitro* versus *in vivo* experimentation. This question may be seen as another facet of the theme of reduction which seems to figure rather prominently in the new philosophy of chemistry. Among other questions philosophers of biochemistry are interested in is whether *in vitro* studies reduce to their *in vivo* counterparts.[1]

An additional feature of the paper by Jacob lies in his presentation of what he calls the Exeter method, "a pragmatic supplement to a comprehensive Theory of Biochemistry". In another place he describes his method as "a flexible and constantly evolving four-step iteration method that is based on philosophy as well as biochemistry". Whether Jacob's proposed method is of value to biochemistry and philosophy of biochemistry remains to be seen and is perhaps a matter for debate. I believe it would benefit the field if readers would consider sending a letter to the editor on this, or for that matter, any articles which appear in the journal. I therefore propose to start a new section for letters which will be carefully considered and sent out for advice rather than formally reviewed as in the case of full length articles. I hope that readers will agree with me that we need more discussion while philosophy of chemistry is still finding its feet. There is no reason why potential authors should be dissuaded from contributing because they are not necessarily prepared to submit a full-length article on any particular question.

The second paper is by a historian of science who began his education as a chemistry undergraduate. In addition Nathan Brooks

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is a world-authority on the writings of Dimitri Mendeleev, having worked with the original archival sources on several visits to Russia. In the present article Brooks considers the origins of Mendeleev's views on periodicity. Given that few of us read Russian this paper represents a valuable addition to the renewed interest in philosophical aspects of the periodic table.[2] Brooks refers to many of the themes which have been discussed in recent philosophy of chemistry and is able to tell us what Mendeleev actually wrote in many articles and even un-published notes. I will mention some of these issues.

The first is the question of whether or not Mendeleev revised his textbook in subsequent editions, an issue on which Kaji,[3] Bensaude and many others have considered (Bensaude, 1986). Then there is the question of the relative value of predictions and accommodations in the acceptance of a new scientific development which many authors in history and philosophy of chemistry have considered (Brush, 1996; Scerri and Worrall, 2001). In the present article Brooks quotes from original sources and claims that it was predictions which "piqued the interest of chemists at the time ...". Brooks takes issue with Brush whom he regards, a little surprisingly perhaps, as supporting the accommodation thesis in the case of the periodic table. Needless to say, the reference to Mendeleev's own thoughts on the subject of prediction cannot settle the wider issue of how the periodic system was received by the scientific community at large. But it is nevertheless interesting to see just how the discoverer of the periodic system regarded the status of his own predictions.

Yet another theme examined by Brooks is the question of Mendeleev's views on the complexity and divisibility or otherwise of the elements and the connection of these ideas to Mendeleev's rejection of Prout's hypothesis. I believe that Brooks has cast new light especially on this question in the paper included in this issue.

The third article is from the Spanish organic chemist Perdo Cintas who examines the historical origins of the tetrahedral carbon atom, including the contributions from Butlerov, Kekulé, Koerner and Paterno. The main conclusions would appear to be that the early views on this subject were not treated realistically. As Cintas reports, "... the spatial structures were not considered as representations of reality but as a way to understand the reactivity". In addition Cintas considers this historical episode, from the philosophical perspective

of Popper's views as well as from that of some critics of Popper. For example Cintas argues that van't Hoff, in particular, concentrated on deducing empirically testable claims from the proposed concept as well as providing conditions under which the concept might be considered to have been refuted.

The fourth article by Jeffrey Kovac also deals with a core question in the philosophy of chemistry. The author re-examines the tendency which exists in philosophy of science to over-emphasize theoretical and logical aspects. Kovac reminds us that so much of chemistry involves what he terms practical reasoning. Needles to say, as Kovac is well aware, this bias has not been completely ignored by philosophers of science since starting in the 1960s many of them began to develop a philosophy of experimentation (Galison, 1987; Gooding, 1990; Franklin, 1986).[4] But this is not quite what Kovac is concerned with since he is referring to practical reasoning rather than practice or experimentation itself. Of course in referring to philosophers of science as having ignored practice I should qualify this to mean analytical philosophers of science. I think it fair to say that Continental philosophers have appreciated the value of practice and practical reasoning with Heidegger's talk of "hammering" being one of the best cases. Other examples include the American pragmatists like Peirce who as we saw in a previous issue was deeply influenced in his philosophical work by his early exposure to chemistry (Seibert, 2001).

The fact that Continental philosophers latched onto practical reasoning and did not confine themselves to logical analyses makes them seem more evolved in this respect but as is also well known their flight away from logic caused them to largely abandon the study of fundamental science. If chemistry is indeed intimately concerned with practical reasoning, as Kovac and others have suggested, there is no need to abandon science but just to embrace the science which lies one step away from the theoretical rigor of physics, namely chemistry.

The issue comes to a close with an interesting review by Fernando Luna of Pierre Laszlo's recent book "Miroir de La Chimie". This book, which will hopefully be translated into English, includes many chemical topics as well as cultural issues related to chemistry. For example one chapter deals with a collections

of portraits of people whom Laszlo regards as having left their mark in the history of chemistry including Borodin, Metzger, Haber and Pauling. Other chapters deal with chemical popularization, the publication process and Laszlo's own list of six favorite chemistry books.

NOTES

1. I have followed the philosopher's rather than the scientific preference in referring to reduction of the more restricted field to the more fundamental one.
2. See special issue of Foundations of Chemistry on the Periodic System, volume 3, No. 2, 2001.
3. An article on the periodic system by Kaji will be published in a forthcoming issue.
4. In addition the philosophy of chemical experimentation has been developed by Davis Baird and Daniel Rothbart (Baird, 2000; Rothbart, 1999).

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