day discourse are particularly rich in observations that establish the power of their interpretation and the opportunities presented by this approach.

Unfortunately the work as a whole will be difficult for outsiders to the sociology or philosophy of science to penetrate. While it makes a real contribution toward the demystification of science, extended passages of sociological shop talk, containing frequently telling and usually judicious critiques of the ideas of other sociologists of knowledge, clutter the work. As a result, a major contribution to the specialty literature that deserves and could reward a broader reading audience will, I'm afraid, fail to attract or excite it as it could.

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The Work of Davy and Prout

The Transcendental Part of Chemistry. DAVID M. KNIGHT. Dawson, Folkestone, Kent, England, 1979 (U.S. distributor, Archon [Shoestring Press], Hamden, Conn.). viii, 290 pp. $19.

Despite the title, this is not the chemical equivalent of one of those recently fashionable books on the affinities between contemporary physics and eastern philosophy: nor is it a study of Kant's influence on chemical theory, although the latter topic is worthy of serious historical consideration. Rather, Knight has presented us with an essay on some of the more philosophical and speculative aspects of chemical theory in the 19th century. These latter include the possible varieties of the states of matter, the number and the relationship of the chemical elements, and the existence and status of atoms. The genre is intellectual history; the accent and emphasis are distinctly British.

In one respect, Knight's book can be read as a skeptical and slightly insular commentary on what are generally seen as the progressive triumphs of continental European chemistry in the epoch between Lavoisier and Mendeleev. Not surprisingly, its heroes are Humphry Davy (to whose work the title alludes) and William Prout (of hypothesis fame). The career of the former is portrayed, not incorrectly, as a succession of sorties against the weaker parts of the structure of Lavoisier's chemistry. Beginning with Davy's early speculations on those contradictory and ambiguous Lavoisierian elements heat and light, Knight shows in an excellent second chapter how the discovery of voltaic electricity at once complicated the problem of the "imponderables" and provided chemistry with a powerful new tool of analysis. It was as the most successful exploiter of this analytical instrument that Davy was to earn enduring fame for the isolation of the first alkali and alkaline earth metals. Paradoxically, it was not Davy's ambition to add to the number of known elemental substances in this way; rather, he had hoped to reduce drastically the number of Lavoisier's "simple substances" by means of electrolytic analysis. Knight also chronicles Davy's assault on Lavoisier's oxygen theory of acids in his investigations of "oxymuriatic acid," which Davy renamed chlorine, having demonstrated conclusively that the gas contained no oxygen. This potentially threatened the collapse of Lavoisier's whole theoretical structure, since it bore also on the theory of base and salt formation; but Davy's Swedish contemporary Berzelius saved the day by transforming the latent dualism of this aspect of Lavoisier's chemistry into the overt dualism of his own electrochemical theory.

The new ontological status that Dalton's atomic theory postulated for Lavoisier's provisional and operationally defined elements did not succeed in diminishing the faith of those who believed in a much less prodigal description of the material universe. Now, however, the faith took on new quantitative forms. In the wake of the first calculations of elemental atomic weights, the English physician William Prout developed his hypothesis that all of the elements were multiples of hydrogen. The Scottish chemist Thomas Thomson staked a professional reputation by endorsing the speculation with new analyses, but lost. Again the indefatigable Berzelius proved nemesis to simplifying British assumptions. Prout's chimera was not so readily dismissed, however: more primitive forms of matter than hydrogen could be, and were, postulated to account for the inconvenience of fractional atomic weights. Also, as Knight demonstrates, contemporaneous developments in organic chemistry like the radical theory, the concept of homology, and the discovery of isomerism helped fuel the hope that an irreducible stoichiometry was not the last word on the structure and properties of matter. The final chapter shows how an evolutionary interpretation of the periodic table reconciled some to the apparently unending proliferation of chemical species.

Knight's own book prompts one further speculation: perhaps it was the relatively slow professionalization of chemistry in Britain that allowed the speculative or transcendental part of chemistry to persist there while in Europe pressures of academic advancement and the development of research schools helped foster a more cautious empirical and instrumental approach. To test this we need more detailed studies of Continental chemistry in this period. But this book should reach beyond the specialist audience in the history of science; it should also prove useful to adventurous teachers of basic chemistry who wish something more than the historical platitudes characteristic of introductory texts. In this latter regard, Knight's essay has one small flaw: although he rehearses a full cast of characters who challenged the orthodoxies of 19th-century chemistry, he has a tendency to turn the script into a prologue for 20th-century developments. He could well have taken a cue from W. S. Gilbert, who realized that Whigs and Tories both must learn to dim their glories.

Readers are advised that this "book" is produced photographically from typescript and contains an unusual number of typographical errors. These do not detract unduly from the author's very readable style.

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