history of chemistry was an important part of lecture courses and textbooks.

Now things are rather different. Chemistry is taught in a dryer manner, and its popular reputation is rather low: in the last century, fertilizers and explosives were examples of triumphant science in the service of mankind—now we view them with trepidation. Professor Brock's book is timely. It is also an astonishing *tour de force*. Cowley wrote of Bacon that "Life did never to one Man allow/Time to Discover Worlds, and Conquer too"; but Brock has digested and mastered an enormous amount of material, and worked it into an accessible form. Unlike some nineteenth-century predecessors, he has not written "applied" history seen almost exclusively from the perspective of the present, but has striven to place past chemists in their context: like them, he has come right up to the present, treading hard on the heels of active chemists. Naturally, there has been a great deal to leave out; this is one of the great tests of the historian, and Brock seems to have been very judicious.

His story begins with alchemy, and then looks at the seventeenth and eighteenth centuries; but the major part of the book, nearly four hundred pages, is devoted to the period between Lavoisier and William Crookes, President of the Royal Society during the "Chemists' War" of 1914–18. Here we can learn about how the science was taught, about the chemical industry (where Brock is sceptical about the chemical empire Britain is alleged to have lost to Germany), and about laboratories, as well as looking in some detail at the various discoveries and interpretations made by chemists. This was the heroic age; and towards the end of it new methods and ideas from physics, notably the spectroscope and thermodynamics, came in and pointed the science in a new direction, dominant ever since.

In our century, chemistry has been "reduced" to physics, and become an essential service science; its language reformed by Lavoisier and his associates has become as rebarbative as that of alchemy; and its history, to which Brock allots 200 pages, is hard for the outsider to follow. Throughout the book, we find chemical equations used when appropriate; and this convenient shorthand, whose history is described, should not be too forbidding for any reader. But in this last part of the book, the equations become formidable; and conceptions such as resonance, molecular orbitals and nucleophilic substitution while presented with admirable clarity and concision are not easy reading for those without a good deal of chemistry. This part might work well for popularizing relatively recent chemistry among those not specially concerned with it, as Mary Somerville's books did in the last century; but it must be chiefly directed at chemists and students of the science. Non-chemists nevertheless ought to read the book too, for there are interesting examples of how progress is not confined to "centres of excellence", of how the notion of simplicity can turn out a poor guide, of enormous and damaging rows between eminent practitioners, and of great men's mistakes; as well as good examples of the relationship of theories to facts, and of evidence to proof. Above all, we see science here as a bold and exciting human activity, whose history is worth study.

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Jutta Kollesch and **Diethard Nickel** (eds), *Galen und das hellenistische Erbe*, Sudhoffs Archiv, Beihefte 32, Stuttgart, Franz Steiner, 1993, pp. 214, DM 74.00 (3–515–06084–7).

The Fourth International Galen Symposium was dogged by misfortunes: the death of its organizer on the conference eve; non-attendance of scholars; non-submission of papers—and, one must add, the historical accident of being held in East Berlin a mere two months before the fall of the iron curtain, which could have led to a more balanced scholarly representation. All of which makes the range of subjects and approaches available

in its multi-lingual Proceedings the more remarkable.

The "Hellenistic inheritance" of the title is susceptible of study under a wide variety of aspects, reflecting the range of Galen's output and the possible range of influences upon him, from Stoic moral philosophy to Alexandrian anatomy. That variety is reflected here, albeit not comprehensively. There are, though, recurrent themes. Chief among them is Galen's notorious attitude of reverence for the distant past (in particular, "Hippocrates"), combined with contempt for—or worse, silence over—more recent, let alone contemporary, authorities. Different aspects of this problem are investigated, with elaborate scholarship, by Vivian Nutton, Diethard Nickel and Paul Potter; by Geoffrey Lloyd, in a valuable attempt to analyse the motivations of Galen's Hippocratism; and by Paola Manuli, whose densely-argued, thought-provoking piece on 'Galen and the Stoics' was tragically to be her last. Repeatedly we see Galen covering his recent tracks while reading his own theories back into "the ancients"—with nightmarish consequences for the historian. As Potter nicely comments, Galen's picture is of "a Hippocrates proficient in Hellenistic anatomy".

One fascinating contribution is Mario Vegetti's (in Italian) on the "nerves of the soul". Here the originality is twofold: (1) to explore the influence of Hellenistic *technology* on Galen (and on the previous medical tradition); (2) relatedly, to demonstrate the co-existence of two models in Galen's "psycho-physiological" explanations: "mechanical" and "pneumatic". The former, on the example of machines using springs and tension, accounts for voluntary motion by means of "nerves"; the latter, influenced by air-run devices, informs notions concerning the heart, heat and emotive reaction. (Here useful light is incidentally cast on the role of metaphor in Galenic explanations.) Vegetti's schematization may seem too neat: but any serious attempt at clarification in this area of Galen's thought is welcome; and the piece is closely argued and ground-breaking. Both this and an equally original contribution by Jackie Pigeaud, exploring the importance to Galen's biological thought of aesthetic ideas—Greek concepts of symmetry and proportion, and the *artistic* nature of creation—seem to point to vital new areas of Galenic research.

Luis García-Ballester usefully traces the origins of the concept—important in medieval Galenism—of the "six non-naturals", in the process casting further light on Galen's approach to mental health. The volume also contains a couple of (German) despatches from the front line of Arabic scholarship, where impressive sallies continue to recover "new" works of Galen—though there is nothing earth-shaking this time around.

Whatever the chain of accidents that went into its making, this admittedly uneven book contains a remarkably high concentration of work of genuine intellectual-historical interest.

P N Singer, London

Gerhard Endress and **Dimitri Gutas** (eds), *A Greek and Arabic lexicon (GALex): materials for a dictionary of the mediaeval translations from Greek into Arabic*, Fascicle 2, Handbook of Oriental Studies, vol. XI, Leiden and New York, E J Brill, 1994, pp. 224, Gld. 65.00, $37.25 (90–04–09893–3).

This fascicle continues the publication of Endress and Gutas' monumental dictionary of the medieval Arabic translations of classical Greek texts (see *Medical History*, 1993, **37**: 207–8), and one continues to be impressed by both the high academic standard of the work and the complexity and scale of the task the editors have undertaken. The ubiquitous Arabic particle *idhā*, for example, is subdivided syntactically and grammatically into sixteen sections covering 26 pages (pp. 154–79). Attention is repeatedly drawn to variant Greek and Arabic passages, and textual anomalies are regularly addressed and resolved. For example, *addā*, "to give in payment", sometimes translates *parembállō*, "to insert", but in the sense of *katabállō*,