bone chisel. Intriguing in the latter context is the mention of "instrumentists" (organikoi) (e.g. pp. 60ff, 158), whose activities as technicians were sometimes the subject of criticism by medical writers, since, on occasion, their quest to perfect surgical tools seems to have taken precedence over the best interest of the patient. Their inventiveness may, perhaps, be seen, too, in certain particularly ingenious surviving surgical instruments.

The content of the papyri is sufficiently interesting to render unnecessary any attempt to push their evidence too far. Thus Marganne is wisely and refreshingly cautious throughout, most notably in her avoidance of attributing the texts to named medical authors (e.g. pp. 65-6), a temptation that past editors have often found too great to resist. Nevertheless, in one case, the early third century AD P. Monac. 2.23 (pp. 96ff), there is no room for doubt, since the fragmentary text concludes with words declaring it to be the fourth book of the Surgery of Heliodorus (c. AD 60–140). Although preserving only twentysix incomplete lines, the papyrus is of the utmost importance since it is the only directly transmitted text of Heliodorus that has survived, and it sheds light both on a unique surgical matter and on Heliodorus' overall approach to surgery.

In fact, Marganne reveals that most of the papyri incorporate information that is either unique or is the earliest occurrence of a surgical matter. By underlining how incomplete is our evidence for Greco-Roman surgery the papyri therefore serve to encourage caution and humility in the interpretation of all evidence for the history of classical medicine. But above all Marganne skilfully demonstrates how immensely illuminating and instructive they are, and we look forward to more of the same!

Ralph Jackson, British Museum R J Hankinson (ed. and transl.), Galen: On antecedent causes, Cambridge Classical Texts and Commentaries 35, Cambridge University Press, 1998, pp. xv, 349, £50.00 (0-521-62250-6).

In 1937 Kurt Bardong published the first edition of Galen's treatise *On antecedent causes* from a fourteenth-century Latin word-for-word (and extremely accurate) translation by Niccolò da Reggio. The timing of its appearance did not favour widespread consultation, and, for all its many interesting ideas, the tract has remained largely unknown. Twenty years ago, Jim Hankinson embarked on a reedition for his Cambridge PhD thesis, including the first ever English translation and a detailed commentary, which now appears in print after yet further revisions and expansions.

The textual basis of this edition is in general sound and the translation clear. Reports of manuscript readings, when checked, are accurate, and Hankinson's choice of readings and emendations is judicious (p. 118, 18 is a rare exception). Divergences from Bardong's text are usually right, and are explained at length in the notes.

The treatise's importance relates more to medical and philosophical theory than to practice. In it Galen lays out a theory of causation, more in the form of a polemic against Erasistratus and, at the end of the treatise, Herophilus than as a coherent exposition. This does not make for easy reading, although the introduction summarizes the general argument and locates it within ancient and modern discussions of causality. The nonphilosopher may find parts hard going, e.g. p. 20, but perseverance brings many rewards. The commentary also discusses specific sections of the argument in detail, explaining the logical reasoning behind Galen's not always clear presentation, and follows the same procedures as in Hankinson's 1991 commentary on Galen's

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Method of healing, books 1–2. While in general this works well, at times the reader will be baffled by the complexity of a note which seems to concern a topic that develops out of the actual commentary far more than one that relates closely to what Galen himself says. Conversely, many of the Realien are passed over in silence: e.g. p. 82, just what sort of hat is a pilleus/pilos?

The weakest sections are to be found in the Introduction. The biography of Galen contains several tiny errors, e.g., p. 6, Galen did not study under Numisianus either in Corinth or Alexandria, and, p. 5, he did not acquire the Terra Sigillata for another thirty years. 'Industrial accidents', p. 4, is a curious term for gladiatorial wounds. The section on the manuscripts and the translator shows signs of incomplete revision. Much more is now known about Niccolò and about P since 1979: Db 93. which contains this tract, survives intact and legible in Dresden: only the first part of this manuscript, Db 92, is badly damaged. My comment, reported on p. 54, refers only to Db 92 or to the two volumes taken together, for they originally formed a single codex, not two as might be assumed from p. 240. The stemma on p. 55, recently confirmed by Michael McVaugh in his article in the Festschrift for John Murdoch, 1997, records manuscripts that do not contain this tract. Nor is De substantia facultatum a cento of De propriis placitis, but the last three chapters of that work circulating under a new title.

A useful appendix lists the abbreviations commonly used for the Galenic Corpus. However, it omits *De theriaca ad Pamphilianum* (xiv 295–310), the synopsis of the *Timaeus* (ed. Walzer) and many fragmentary texts, like the commentary on *Airs, waters, and places*, casts unjustified doubt on the authenticity of *Paru. pil., Syn. puls., Ther., Gloss., and Praes.*, wrongly expands *Hipp. Off. Med.*, and fails to stigmatize *Qual. Incorp.* as non-Galenic.

But these weaknesses should not obscure the many strengths of this edition, which, it is hoped, will reintroduce to a much wider audience an effectively unknown text by Galen. In particular, the clear and accurate English translation will facilitate its use by historians as well as classicists.

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Päivi Pahta, Medieval embryology in the vernacular: the case of De spermate, Mémoires de la Société Néophilologique de Helsinki, vol. 53, Helsinki, Société Néophilologique, 1998, pp. xii, 328, \$45.00 (951-45-8346-9). Orders to: Tiedekirja Bookshop, Kirkkokatu 14, FIN-00170 Helsinki, Finland. Fax: +358-9-635017; e-mail: tiedekirja@pp.kolumbus.fi

Embryology has a privileged place in early medical writings as an aspect of the human condition which generated interest from medicine, philosophy and theology. The Latin *De spermate*, edited here in English translation, takes its place within a range of separate treatises dealing with subjects such as coitus, the development of the foetus, and conception. Although much ink was spilt discussing the divergent opinions of Aristotle and Galen on the presence of female seed, the English text steadfastly refuses to enter that debate and maintains a strong belief in female seed. Indeed, to read the text in its entirety one could easily be lulled into believing that the hidden process from conception to birth was well-known and understood, with the sole exception of the relations between body/foetus and soul on which the text dwells, guided in the matter by Porphyry.

A proportionately large section of the work covers heredity. The inheritance of physical characteristics, dependent on such things as the hour of conception and the strength, quantity and quality of the parents' sperm, is laid out in detail.