ancient Greeks do? We learn a lot about ancient infanticide. We learn that "Sparta was a community that took sex seriously". And then, of course, we learn about the eugenic ideas of Plato. We read about the Romans and the Hebrews, and all this is interesting. The reader may wonder why the Minotaurus is not worth mentioning. Daedalus, after all, was also active as a gynaecologist.

We are introduced to the Middle Ages in a chapter called "Sanctity, body heat, bad cess, and blood". From there we go on to the Renaissance in a chapter entitled "Of eggs and sperm", which begins with the sentence: "By the time the master frescoist Giotto began working on the elegant yet emotionally charged cycle of paintings whose brilliant hues cover every square inch of the barrel-vaulted Madonna dell Arena Chapel in Padua, then an independent republic neighbouring Venice, the university there was already a century old, having opened its doors in 1222." Too much, too much! We also learn about Harvey, Malpighi, Swammerdam, Leeuwenhoek, von Baer and Weismann. The chapter ends with a brief mention of "an obscure monk named Gregor Mendel". So much for the first 100 pages. The next 50 deal with various forms of eugenics including Nazi racial hygiene. Here the writing becomes concise.

The real message of the book begins in the second half. It is worthwhile to read what the author has to report here about artificial insemination of animals and women. She tells us that "during the 12 months spanning 1986 and 1987, there were some 172,000 artificial inseminations in the United States of which about half were with donor sperm". The author points out the paradox that the veil of secrecy over the procedure makes an objective evaluation impossible.

Here too is the fascinating story of the slow path to success with human *in vitro* fertilization trodden by Edwards and Steptoe in 1978. Today's success rate with the technique is still not much higher than 20 per cent. The "average price tag for an IVF baby (as of 1989) was US$50,000". Of course, little of this is paid by medical insurance — surrogate mothers get $2,000. It is big business now. The freezers are full of pre-embryos and have to be cleaned out from time to time. When that happened in the United Kingdom a couple of months ago, it caused an outcry.

Maranto also writes about preimplantation diagnosis. A single cell may be removed from a cleaving embryo without damaging the remaining embryo. This isolated cell may be analysed by the polymerase chain reaction or fluorescence *in situ* hybridization for the presence or absence of a certain genotype. To do so is high technology and not ordinary medicine. Worldwide, some 30 such children have been born. The author cites one case where the test for the presence of a Y chromosome went wrong. The embryo was later aborted.

These last chapters provide the real interest of the book. For those who want to know more, the author has prepared an impressive list of references, all in English. Finally, the last sentence is a memento for all involved, however borderline, in such work: "Where love, compassion, altruism, and justice have failed, genetic manipulation will not succeed." □

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Textbooks at a glance

Excellent ★★★★ Good ★★★ Fair ★★ Poor ★

Stars as Laboratories for Fundamental Physics

By Georg G. Raffelt
University of Chicago Press
$77, £61.50

THE Standard Model of particle physics has been spectacularly successful. Yet there are hints of new physics (particularly involving neutrinos), and questions remain unanswered. Particle physicists are increasingly turning to astrophysics as they search for clues to lead them beyond the Standard Model — clues, for example, about neutrinos with finite mass or non-standard interactions, or the existence of axions or other new particles. The burst of neutrinos seen from supernova 1987A was well explained by models of the supernova collapse process. A flux of undetected axions would have produced an extra channel for energy loss from the collapsing core, so that the observed neutrino emission in fact set stringent limits on the presence of axions.

Georg Raffelt gives an extensive and expert review of this new speculative research area on the boundary between particle physics and astrophysics. He emphasizes the fundamental physics, and provides a detailed compendium of results for the serious student.

Michael L. Cherry Department of Physics and Astronomy, Louisiana State University, USA

Range	★★★
Depth	★★★★
Accuracy	★★★★
Up-to-dateness	★★★★
Accessibility	★★
Style	★★

Foundations of Geomagnetism

By George Backus, Robert L. Parker & Catherine Constable.
Cambridge University Press
£40, $59.95

THE invention of the compass and its use for navigation propelled the study of the Earth's magnetic field, geomagnetism, to the forefront of natural science. It remains an exciting research area.

George Backus's lecture notes, developed over many years, are well known among theoretical geophysicists as an authoritative source for the subject's mathematical foundations. The lectures on geomagnetism have now been edited for publication.

The result is no ordinary textbook. It concentrates on rigorous mathematical development; although the main field, palaeomagnetism, and the external fields are treated well, no attempt is made to be comprehensive or up to date. For example, electrodynamics and mathematics applicable to spherical geometry occupy over half the book, whereas mean-field theory and dynamics of dynamos get six pages each.

This is essential reading for any mathematics graduate working in geomagnetism and useful to others working in spherical geometry; it will remain authoritative for many years to come.

David Gubbins Department of Earth Sciences, University of Leeds, UK

Range	★★★
Depth	★★★★
Accuracy	★★★★
Up-to-dateness	★★
Accessibility	★
Style	★★★★

Understanding Fossils: An Introduction to Invertebrate Palaeontology

By Peter Doyle
Wiley
£17.99, $34.50 (pbk)

A LARGE difficulty faced by those who teach palaeontology is striking a balance in undergraduate courses between source data — the systematics and ranges of the fossil groups — and their application.

This new book presents one man's solution, condensing into a single volume straightforward descriptions of the main taxonomic groups from foraminifera to trilobites, as well as trace fossils, together with case histories showing their applications in studies of evolution, ancient environments and stratigraphy.

The sheer concentration of topics occasionally reduces the text to almost a list. Nonetheless, this is a user-friendly treatment that will make a good course text supplemented with the latest papers from the literature. But there remains scope for a book that weaves data from fossil invertebrates, as presented here, into an account of vertebrates (including dinosaurs) and plants, allowing the student to appreciate the importance of the fossil record as a whole.

Derek E. G. Briggs Department of Geology, University of Bristol, UK

Range	★★★
Depth	★★★
Accuracy	★★★
Up-to-dateness	★★★
Accessibility	★★★
Style	★★