

BOOK REVIEWS

A Legendary Thinker

Hypatia of Alexandria. MARIA DZIELSKA. Harvard University Press, Cambridge, MA, 1995. xii, 159 pp. \$29.95 or £23.95. *Revealing Antiquity*, 8. Translated by F. Lyra.

A library fire in A.D. 391, the lynching of a philosopher by Christian radicals in A.D. 415, and with these incidents the end of learning in the ancient world—the story has become familiar in popular histories. In this detailed, critical reassessment of the life of Hypatia of Alexandria, Maria Dzielska exposes these legends as literary and historiographic inventions (promulgated, for example, in Edward Gibbon's great *Decline and Fall* and in Charles Kingsley's 1853 novel *Hypatia or New Foes with an Old Face*), fed by anticlerical ideologies in the 18th and 19th centuries. The accurate account, painstakingly pieced together by Dzielska from the fragmentary record, is more complex and far more interesting.

By the early 390s Hypatia (then about 40 years of age) was a distinguished teacher of Neoplatonic philosophy, the charismatic leader of a tight-knit and influential circle of intellectuals and aristocrats, including some prominent Christians (among them three future bishops). Dzielska portrays the group as elitist, secretive, and devoted to classical learning and philosophical spirituality, with modest elements of ritual, like meditation, prayers, and hymns. Even as the Serapeum, a pagan cultic center, was stormed by the military at the request of the patriarch Theophilus in 391 (or 392), in the wake of riots instigated by the patriarch's anti-pagan policies, Hypatia's group continued unmolested for over a decade. Hypatia and Theophilus appear to have worked out a *modus vivendi* that accorded to both of them political influence with the civil authorities.

The situation changed with the appointment of a new patriarch, Cyril, in 412. Dzielska emphasizes that in his dealings with Hypatia Cyril acted through political, rather than religious, motives. Ambitious for power, he launched a persecution of his Christian opponents and then a pogrom of the Alexandrian Jews in 414, after which, when he perceived her influence over the prefect, he sowed a campaign of hate against Hypatia for alleged sorcery. Hypatia

was assaulted by a mob (perhaps the patriarch's own militia, the "parabolans"), dragged from her carriage, and brutally murdered. As Dzielska interprets the event it was a politically motivated assassination in accordance with the wishes, if not the express command, of the patriarch.

Through a subtle reading of the ancient sources Dzielska reconstructs a powerful and persuasive account of Hypatia's life. She also addresses the difficult task of describing her philosophy. A charismatic teacher and lecturer, Hypatia left no philosophical writings. Consulting what is known of the writings of her followers, combined with a few anecdotes in the ancient histories, Dzielska portrays Hypatia as an eclectic Neoplatonist (in the metaphysical tradition of Plotinus and Porphyry) who, by avoiding the cultic and theurgic excesses of the tradition of Iamblichus, could thrive amid the anti-pagan policies of the Alexandrian patriarchs.

It is clear, however, that Hypatia's historical influence was more significant in mathematics than in philosophy and that the major audience for Hypatia studies today is among scientists and mathematicians. Dzielska's discussion of this aspect of Hypatia's work is unsatisfactory. Dzielska plainly does not know mathematics (she twice describes Apollonius's *Conic Sections* as a treatise in trigonometry). Her remarks, brief as they are, depend almost entirely on two recent accounts by Alan Cameron that are emphatically revisionist and provocative, but speculative and unpersuasive. She follows Cameron, for instance, in his conclusion, reached through an analysis of the *titles* (in fact, of two words in two of the titles) of the various commentaries by Hypatia's father, the astronomer Theon, that Hypatia, working as his collaborator, prepared the extant texts of Ptolemy's *Almagest* and *Handy Tables* (p. 102). Dzielska might better have reported the more cautious words of the late Otto Neugebauer: "Nothing definitive can be said about a Theonic edition of the *Handy Tables* without an investigation of all extant manuscripts" (*History of Ancient Mathematical Astronomy*, 1975). No such investigation has yet been undertaken.

Further, Dzielska observes that Hypatia's technical studies were devoted mostly to editions and commentaries of standard authors like Diophantus, Apollonius, and

Ptolemy, whence "Cameron's observation that there is no reason to lament the complete loss of Hypatia's writings seems justified" (p. 72). Yet through their commentaries and editions of Euclid, Diophantus, Apollonius, and Archimedes, Theon and Hypatia, as well as their distant successors Eutocius of Ascalon and Isidore of Miletus (sixth century), profoundly affected the surviving Greek texts of these writers. Even a few fragments of Hypatia's commentaries could assist the effort to filter out the oldest stratum of the texts from the commentators' additions. Recent efforts along these lines, which Dzielska does not cite, appear in the editions of Diophantus prepared by J. Sesiano (1982) and R. Rashed (1984), for instance, as well as in the present reviewer's *Textual Studies in Ancient and Medieval Geometry* (1989).

While discussions of these matters are necessarily speculative, since Hypatia's mathematical works are lost, the situation is no different from that of her philosophy, about which Dzielska inquires with such engagement and finesse. If it is true that mathematicians writing on Hypatia have tended to be naïve on the cultural context, the cultural experts provide no remedy by slighting scholarship on the mathematics. The obvious solution would be a collaboration. For now, we still await a satisfactory account of Hypatia's work and influence.

Dzielska attaches a brief but valuable note on "other learned women of late antiquity" (pp. 115–117). To that list one can add the dedicatee of Pappus's third book of the *Collection*, a distinguished teacher of geometry, named Pandrosion, whose gender has recently been restored by Alexander Jones through a correct reading of a single letter in the manuscript (see his *Pappus of Alexandria*, 1985).

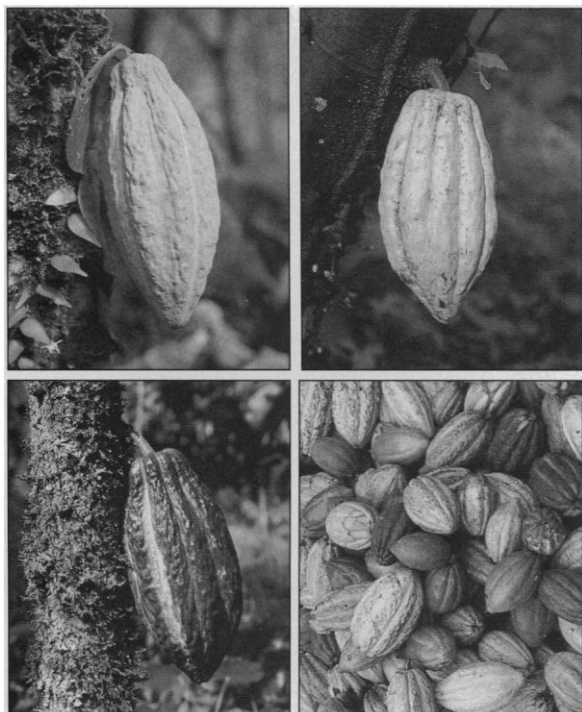
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Other Books of Interest

The Chocolate Tree. A Natural History of Cacao. ALLEN M. YOUNG. Smithsonian Institution Press, Washington, DC, 1995. xvi, 200 pp., illus., + plates. \$24.95 or £19.50. Smithsonian Nature Books.

Ready for a new research topic at the end of his fieldwork on cicadas in Costa Rica, Allen Young turned his attention to the pollination biology of *Theobroma cacao*. One result is this account of the natural and agricultural history of a plant with "a most



"Ripening pods on cacao trees in a plantation, and in a pile after harvesting." [From *The Chocolate Tree*]

intriguing biological story to tell." The role of humans in its dispersal from its natural habitat as a rain forest understory tree in Amazonia is uncertain, but its attractions include not only the seeds from which our familiar chocolate is produced but a sweet and nutritious pulp surrounding them. Today two main domesticated types, *criollo* and *forastero*, exist. Young devotes two chapters of his book to the history of cacao cultivation, carried out in Central (but apparently not South) America before European contact. Of both economic and symbolic importance in Mesoamerican prehistory, the plant today is cultivated throughout the humid tropics, generally on plantations of modest scale. Young discusses its place in the Costa Rican agricultural economy, describes the efforts of the Centro Agronómico Tropical de Investigaciones y Enseñanza to improve its uncertain yield through selective breeding and other means, and outlines procedures used to process it for consumption. Turning to the



"*Theobroma cacao*. This drawing originally appeared in *Rerum medicarum Novae Hispaniae thesaurus* (1651) by F. Hernández. [From *The Chocolate Tree*, after R. E. Schultes, "Amazonian Culti-gens and Their Northward and Westward Migrations in Pre-Columbian Times"]

natural history of the tree, Young describes its biological features: cauliflory, or the growth of flowers directly from the trunk; a tendency toward self-incompatibility with respect to pollination; relatively large, football-shaped fruits; and spreading roots that accommodate mycorrhizal symbionts. Holes chewed by squirrels and monkeys and decaying plant material supplied by farmers provide breeding niches for the midges on which the tree depends for cross-pollination. Young recounts in some detail his research on cacao pollination, including investigation of the possible role of bees but focused mainly on various midges, including such topics as their breeding habits and the floral fragrances that attract them. A general conclusion he states is that "Because of cultivation practices in place for several hundreds of years, an imbalance exists between the flowering behavior of cacao trees, the spatial arrangement of these trees, and the natural behaviors

of pollinating insects"; in other words, *Theobroma cacao* "is still ecologically tied to the rhythms of the rain forest," not the plantation. The book is illustrated with photographs, drawings, and color plates and includes an appendix giving common and scientific names of plants and animals mentioned in the text, a bibliography, and an index.

Katherine Livingston

The Biology of Tardigrades. IAN M. KINCHIN. Portland, London, 1994 (U.S. distributor, Ashgate, Brookfield, VT). xii, 186 pp., illus. \$65 or £40.

Known in the vernacular by such names as water bear or moss piglet, tardigrades were among the first "animalcules" observed by Leeuwenhoek in his microscope. Over 300 years later these cylindrical-bodied aquatic creatures with four pairs of clawed legs remain of uncertain taxonomic affinity. In his introduction to this work Kinchin attributes the lag in research on tardigrades to their lack of economic or medical importance but notes a resurgence of interest in them, citing the 1983 publication, in Italian, of a monograph and six international symposiums in recent years. Arguing that the (presum-



"Antero-lateral views of a typical limno-terrestrial heterotardigrade, *Echiniscus mauccii* (top) and a typical eutardigrade, *Macrobiotus tonollii* (bottom)." Bars = 20 μ m. [From *The Biology of Tardigrades*; SEMs courtesy of Diane Nelson]

able) phylum is of considerable evolutionary importance, Kinchin here sets out to "give a balanced view of the current state of knowledge" regarding it. The treatment begins with a discussion of the origins of the group (which is represented in the fossil record by only two species) in light of invertebrate evolution generally and of its systematics, there being two principal classes, distinguished on the basis of the presence or absence of dorsal plates, with some 750 known species. There follow chapters on external and internal morphology, reproduction and life history, cryptobiosis (important for survival in the fluctuating moist terrestrial environments some species inhabit), and ecology. Because of collecting difficulties deep-sea benthic species are relatively unstudied compared to those that inhabit mosses, soil and leaf litter, or other marine environments. The text ends with a brief summary of collecting and preserving techniques, a "Guide to common species," and an outline of future research needs, with respect to which the author sees "ample scope" for contributions by amateurs as well as professionals. These are followed by a glossary, a 19-page selective bibliography, and a subject index. The volume is extensively illustrated with drawings and electron micrographs and includes a number of tabular summaries.

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