University Observatory between 1862 and his death in 1882, although his political activism and emerging interest in spiritualism from 1877 may also have been factors in his growing unpopularity. At any rate, the University chose not to appoint a new Professor of Astrophysics following his death.

The final section of this book, "Studies on K.-F. Zoellner", contains just two chapters. The first is by that master astronomical historian and Zöllner expert, Dieter B. Herrmann, who over the years has published a succession of studies on this pioneering astronomer. Herrmann believes that "... Karl Friedrich Zöllner was one of the central figures in the early history of astrophysics in Germany. Without his work the genesis of the new scientific discipline of astrophysics cannot be understood." This is high praise indeed, but sums up Zöllner's vital role in the international development of astrophysics. Finally, Hamel brings this fascinating book to a close with a list of Zöllner's 87 publications, plus key biographical works about Zöllner.

Sterken and Staubermann are to be congratulated on producing a readable volume about one of the key figures in nineteenth century German astronomy – even if he is sometimes misunderstood, and I particularly recommend this book to anyone interested in the history of astrophysics.

Wayne Orchiston

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Queen of Science, Personal Recollections of Mary Somerville. edited and introduced by Dorothy McMillan. (Edinburgh: Canongate Classics 2001), xlii + 434 pp., 195 × 125 mm, £8.99 softback,.

Mary Somerville (1780-1872), mathematician, theoretical astronomer, and writer, is among the most celebrated women in the history of science. The daughter of an admiral in the Royal Navy, Somerville was brought up in a small seaport in Scotland. She received little formal education in her youth; yet she longed to learn and, mainly through her own persistence, became her own principal tutor. Later, with the help of sympathetic Edinburgh academics she mastered the calculus and was introduced to the works of the great continental mathematicians. She was married and widowed young, but in her second husband and first cousin William Somerville, an Army doctor, she acquired a partner who shared her enthusiasm for science and encouraged her studies. The Somervilles began their married life in Edinburgh among that city's liberal intelligentsia, but soon moved to London which was their home for over twenty years. Their English circle included a galaxy of scientists, most influential among whom was John Herschel who became a lifelong personal friend and adviser. Others were William Wollaston, the first to discover dark lines in the Sun's spectrum, and Charles Babbage of calculating machine fame. Early in her career Mary Somerville gained the friendship of the distinguished Paris school of scientists including the great Marquis de Laplace. When Mary was 58, her reputation well established, the family moved to Italy for the sake of her husband's health. There she was to live out the rest of her long life. She died in Naples at the age of 92 and is buried there. Mary Somerville first shot to fame with a theoretical treatise, *The Mechanism of the Heavens* (1831), a rendering in English of Laplace's monumental *Mécanique Céleste*. Two books addressed to a wider educated readership, *The Connection of the Physical Sciences* (1834) and *Physical Geography* (1848), were best sellers that went into several editions. In her old age she tackled a new field (biology) with *On Molecular and Microscopic Science* (1869) published in her ninetieth year. Towards the end of her life she also wrote her Personal Recollections, annotated and published after her death by her daughter Martha. It is from these Recollections that most of our knowledge of Mary Somerville's remarkable life is based. The original edition (1873) is now rare, and a new one is therefore to be warmly welcomed. The present re-issue, with the title *Queen of Science* (a sobriquet given by an obituarist), published in the Canongate Classics series of Scottish writing, is edited and introduced by Dorothy McMillan, head of English and

Scottish literature at the University of Glasgow. It is, however, considerably more than a reprint of the first: it includes not only the text as published at the time, but also Mary Somerville's own earlier drafts. Some passages from Mary's original version were modified by the daughter, evidently in order to give her mother a less forceful and more ladylike character such as would appeal to late Victorian British ideals. On the whole, however, the changes were not numerous or particularly drastic, and Dr MacMillan truly remarks that, even after editing, the Personal Recollections had "all the immediacy of a diary" and "the seeming freshness of youth". The editor has supplied explanatory notes to *Queen of Science*, and well over three hundred brief biographies of people – family members, friends, scientists, artists, public figures – recalled by Somerville's amazingly-retentive memory over an unusually long life. An appendix gives helpful translations of interesting letters in Italian or French which are interspersed among the Recollections. Thus, through the editor's care and undoubtedly laborious preliminaries, the way is cleared for the reader to enjoy these fascinating memoirs uninterrupted. The Introduction, though occupying only some 30 pages, looks at Mary Somerville the Scot, and surveys her place, as a woman and as a scientist, in the world – or worlds – in which she moved. In addition to its literary interest, *Queen of Science* will be an indispensable aid to students of Mary Somerville's work and an important source of information for historians of nineteenth century astronomy and of science generally.

Mary Brück

The Roman Cult of Mithras: The God and His Mysteries by Manfred Clauss, translated by Richard Gordon, 2000 (Edinburgh University Press: Edinburgh) 198 + xxiv pp, ISBN 0 7486 1230 0, hard cover, price £49.50, ISBN 0 7486 1396 X, soft cover, price £16.00, 234 × 158 mm.

> Mithras, God of the Midnight, here where the great bull dies,
> Look on thy children in darkness. Oh take our sacrifice!
>
> *A Song to Mithras*,
> Rudyard Kipling

The cult of Mithras was one of a number of 'mystery religions' which flourished under the Roman Empire. It began to spread during the first century AD, was at its peak during the second and was extinct by AD 400. The cult was only open to men and its adherents were mostly soldiers serving in the legions, merchants, freedmen, and slaves. The congregations were kept small and met in distinctive temples, *mithraea*, which have been found *in toto orbe Romano*, throughout the Empire. However, the cult seems to have been particularly strong in Rome itself, its port Ostia and the northern provinces on the Rhine and Danube. The origins of the cult are obscure, though, like some of the other mystery religions, it is usually thought to have come from the East. Attempts, more or less convincing, have been made to link the Roman Mithras with the Persian god of light, Mitra and with Zoroastrianism. Plutarch reports that the Cilician pirates defeated by Pompey in 67 BC worshipped Mithras, though any connection with the Roman cult is conjectural.

The doctrines of the cult were secret (that is, a 'mystery') and were revealed only to initiates. As far as is known they were never written down and thus were lost when the cult died out. Such few written descriptions of the cult as survive are fragmentary and come from authors, mostly Christians, who were opposed to it. However, what has survived are examples of the decorations which adorned the mithraea. These ornaments follow a fairly standardized iconography which is both distinctive and suggestive. They are often seen as the key to understanding the cult, though any interpretation of them must necessarily remain speculative.

Much of the supporting mithraic imagery undoubtedly contains astronomical elements: representations of the Sun, Moon, planetary gods, and zodiacal constellations are common. However, the central image of the cult, present in virtually every mithraeum, is the *tauroctony* or bull-slaying. Here Mithras, always in his distinctive phrygian cap and always with his eyes averted, slays a bull, usually surrounded by a supporting cast including a scorpion, a serpent, a dog, a raven, a lion and a drinking cup. Various explanations have been offered for the symbolic significance of this enigmatic and striking tableau, and some of these have been