NICHOLAS JARDINE and ALAIN-PHILIPPE SEGONDS, **La Guerre des Astronomes: La Querelle au sujet de l'origine du système géo-héliocentrique à la fin du XVIe siècle. Volume 1: Introduction**. Paris: Société d'Edition Les Belles Lettres, 2008. Pp. xxiv + 290. ISBN 978-2-251-34513-0. €40.00 (paperback).

NICHOLAS JARDINE and ALAIN-PHILIPPE SEGONDS, **La Guerre des Astronomes: La Querelle au sujet de l'origine du système géo-héliocentrique à la fin du XVIe siècle. Volume 2/1: Le *Contra Ursum* de Jean Kepler, Introduction et textes préparatoires** and **Volume 2/2: Le *Contra Ursum* de Jean Kepler, Édition critique, traduction et notes**. Paris: Société d'Edition Les Belles Lettres, 2008. Pp. xx + 222 and 223–634. ISBN 978-2-251-34512-3. €85.00 (paperback).

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This work combines lucid, sophisticated analysis with painstaking editing and translation of a collection of related documents. The main focus is on a rather brief, unfinished manuscript by Johannes Kepler that lay unpublished and unknown for a quarter-millennium.

When Nicolaus Raimarus Ursus published his geo-heliocentric hypothesis of the heavens in 1588, Tycho Brahe asserted that this was a version of his own invention, the Tychonic system, accused Ursus of plagiarism, and assigned Kepler to refute him. After Tycho's death in 1601, Kepler put the manuscript away. It was eventually sold to Catherine the Great of Russia in 1774 and reposed in the Russian archives until Christian Frisch published it for the first time in 1858. Nicholas Jardine brought it out in English translation in 1984, Volker Bialas edited it in facsimile in 1988, and now it appears in a bilingual French–Latin edition by Jardine and Segonds.

In 1984, when Jardine first asserted that Kepler's essay had major significance in the history and philosophy of science, many scholars were still focusing on a linear progression of brilliant discoveries called the Scientific Revolution. Since then, the old linear view has dissolved into a more complex picture of early modern science as a free-for-all battle of ideas in many media, and there is a heightened awareness that astronomers were moving from cloister and university to the higher social sphere of princely courts.

The competition to become astronomers, astrologers, physicians and advisers to princes pitted brilliant parvenus like the former swineherd Ursus against middle-class university graduates like Kepler and Helisaeus Roeslin and even against a great aristocrat like Tycho. The heat of their battles over geo-heliocentric systems required them to state their presuppositions and assumptions with exceptional clarity but also produced some retrospective reconstructions and even lies. Priority of discovery was claimed by means of correspondence, oral transmission, marginalia and models, as well as by publication. Honour and *fama* were major motivating factors among these courtiers, and the boundaries of classical decorum were sometimes grossly violated. As each played to his strengths, astronomy acquired a striking richness and diversity.

Ursus had spent two weeks poking around Uraniborg in 1584, arousing Tycho's suspicion. In 1586, he claimed that he learned about Tycho's unpublished hypothesis from a runaway servant. In Cassel, a friend made a brass model of the system that Ursus claimed as his own, but when Christopher Rothmann pointed out its flaws, Ursus stormed off to Strasbourg, where he lectured on astronomy with Roeslin among his auditors. Rothmann wrote to Tycho and informed him of the events in Cassel, referring to Ursus as a 'dirty lout'. Three months after Ursus published his system, Tycho published his own geo-heliocentric system, which differed from that of Ursus by showing the path of Mars cutting through the solar orbit at two points, which Tycho thought possible because Rothmann had convinced him that solid celestial spheres did not exist. Meanwhile, Roeslin was corresponding with Michael Maestlin regarding an alternative system he had developed after hearing Ursus, and which he published in 1597.

Tycho was convinced that Ursus had plagiarized an early, imperfect version of his own Tychonic system. He sent long letters, describing how he had developed his system, to important figures in Germany in order to establish his claims of priority. Meanwhile, the imperial

vice-chancellor, Jakob Kurz, nominated Ursus in 1591 to be Imperial Mathematician. Tycho wrote to Kurz and the imperial physician, Thaddeus Hagecius, denouncing Ursus as a plagiarist and presenting evidence. In 1596, Tycho published his correspondence with Rothmann and Landgrave Wilhelm IV of Hesse-Cassel. The proofreaders inadvertently failed to delete Ursus's name and Rothmann's blunt description of him.

Ursus was furious and responded with an extremely coarse and vitriolic publication in 1597, demeaning Tycho in every imaginable way, refuting Roeslin's accusations of blasphemy, viciously denigrating Rothmann, and claiming priority for inventing the geo-heliocentric hypothesis of planetary motion. Tycho now launched a massive drive to destroy Ursus. As he slowly moved up the Elbe towards Bohemia, he corresponded and collected depositions from eyewitnesses regarding Ursus's conduct. In June 1599, Tycho finally entered Prague and was immediately received by the emperor, while Ursus hid away in disgrace. Tycho soon became an imperial favourite and close adviser.

During 1600, Tycho assigned two of his learned assistants to refute Ursus. Johannes Müller proved that Martianus Capella's theory of planetary motion had nothing in common with Tycho's system. Johannes Kepler debunked Ursus's claims that Apollonius of Perga anticipated Tycho and that Copernicus and Capella had described the Tychonic system. He also exposed grave misunderstandings and inconsistencies in Ursus's assertions regarding astronomical hypotheses. Meanwhile, Tycho's case at law before an imperial commission resulted in total victory. All copies of Ursus's defamatory writings were confiscated and burned. Ursus died on 16 August 1600, having just published yet another attack on Tycho.

Recruitment of Kepler to Tycho's cause had got off to a bad start because young Kepler had written an adulatory letter to Ursus, which Ursus printed in his defamatory book attacking Tycho. As fate would have it, Tycho received a copy of Kepler's *Mysterium cosmographicum* in the very same packet that brought him a copy of Ursus's book. Tycho recognized Kepler's genius and wrote him a long, cordial letter but also stated his case against Ursus and sent a copy of the letter to Kepler's old teacher, Maestlin. Maestlin advised Kepler to send a full explanation and apology to Tycho, and Kepler did so, but only after waiting ten months for a letter from Tycho to reach him. By then, Archduke Ferdinand had begun to drive all Protestants from Styria, and Kepler was desperate to find a new position. He joined Tycho's household at Benátky Castle from February–April 1600 and wrote an evaluation of Ursus's claims for Tycho's aristocratic assistant, Frans Tengnagel van de Camp. Worried and under great strain, Kepler exploded in April, stormed off to Prague, apologized, was reconciled with Tycho, and went home. Finally expelled from Graz that autumn, he returned to Tycho's service with the specific assignment of refuting Ursus's defamatory book. Kepler worked on the manuscript until April 1601 and then left for a last visit to Graz. He was present when Tycho died in Prague on 24 October 1601 and was soon appointed imperial mathematician.

This splendid edition of the documents involved in this controversy includes extensive translated excerpts from letters and other sources. Translations of longer documents appear in volume 2, including the manuscript Kepler wrote for Tengnagel in March 1600; Kepler's notes on the last two publications of Ursus; and Kepler's unfinished *Apologia pro Tychone contra Ursum*, with a summary analysis, 185 pages of notes, codicological analysis, examination of Kepler's rhetorical strategy and philological methods and of the significance of the manuscript, and a full apparatus of indices and bibliography. A forthcoming volume will present translations of two additional published works by Ursus, Tycho Brahe's published description of the Tychonic system and extensive parts of his correspondence with Rothmann, and Roeslin's 1597 publication, *De opera Dei creationis*.

This work is a model of meticulous and penetrating scholarship. It presents an important debate among astronomers at the end of the sixteenth century in a manner that combines

analysis in depth with painstaking translation of the primary sources and an exhaustive scholarly apparatus.

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Michael Hunter, **Boyle: Between God and Science**. New Haven and London: Yale University Press, 2009. Pp. xiii + 366. ISBN 978-0-300-12381-4. £25.00 (hardback).
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The seventeenth-century life of Robert Boyle is a mirror of some of the great themes of his age. Seventh son, gentleman, wealthy landowner, Etonian, visitor to the Continent, Protestant-educated, multilinguist, moralist, alchemical adept, forerunner of modern chemistry, champion of experimental philosophy, popularizer of the air-pump, promoter of natural philosophy, early Fellow of the Royal Society, formulator of what came to be called 'Boyle's law', prolific author, citizen of the Republic of Letters, a director of the East India Company, principled lifelong celibate, medical reformer and practitioner, hypochondriac, man of tender conscience, man of charity, pious believer, Bible reader, lay theologian, apologist for reasonable Christianity, high priest of nature, advocate of natural theology, founder of the eponymous lectureship in defence of the faith, backer of foreign Bible translations, supporter of overseas missions and governor of the Corporation for the Propagation of the Gospel in New England – Boyle was all of these things and more. In *Boyle: Between God and Science*, Michael Hunter weaves together this rich tapestry of a full life into a balanced, holistic, compelling, readable and – above all – authoritative biography. It is also notable as the first full-length biography of Boyle in forty years, the last being R.E.W. Maddison's *The Life of the Honourable Robert Boyle, F. R. S.* (1969) – a work that, though useful, cannot be called comprehensive.

Without doubt the leading expert on Boyle today (and probably at any time), Professor Hunter has already made lasting contributions to Boyle scholarship in studies of Boyle's life, in the Robert Boyle Project and in taking the lead in editing Boyle's writings. This biography is in part a distillation of this massive body of primary sources and the decades of research Hunter has devoted to Boyle. As such, the biography has a strong intertextual relationship with this other published material, allowing it the luxury of greater concision and focus than otherwise would have been possible. This book therefore forms part of a much larger project. It is worth reflecting on how these efforts have changed our view of Boyle. As Hunter himself reminds us, Boyle became moderately famous in his own lifetime. So much was he sought after in London that he was eventually forced to post visiting hours on his door. Despite this fame in the seventeenth century, his status as an icon of British science was eclipsed in the eighteenth century by Isaac Newton. Hunter's efforts through his research, the Boyle Project and now this worthy biography have allowed Boyle to come out from under the shadow of Newton.

The volume's fifteen chapters provide a linear narrative that takes the reader through Boyle's life in a chronological progression. This is true to the book's aims, which are 'to present a narrative of Boyle's life from cradle to grave, at the same time doing justice to the leading themes in his personal and intellectual development on the basis of the profuse materials that have become available in recent years' (p. xi). Robust enough intellectually to satisfy the scholar, this biography is also relatively free of jargon and certainly accessible and lively enough to please the non-specialist. The readability of Hunter's narrative is facilitated in part by a text that is largely unencumbered with historiography, which is treated instead in a useful bibliographic essay. Also helpful is the 'Table of Boyle's whereabouts, 1627–1691'. The endnotes furnish sufficient detail