whelmingly unfavorable for wine production, and the French phenological data are similar. Ladurie notes this correspondence with the expansion of Alpine glaciers from 1554 to 1592, and then the especially cool episode 1593–1602 saw quicker glacier advance and the crushing and burying of alpine hamlets. The extracts from contemporary accounts make vivid and alarming reading, as masses of ice larger than houses crashed down on houses and fields overhung by the snouts of advancing glaciers. These accounts and the increasingly accurate sketches and paintings which were made from the 17th century onward allow the accurate measurement of ice advance relative to the present. The work of the local clergy to halt the ice led in one case to the planting of a cross at the advancing snout (in 1818) which existed until the early 20th century and provided an accurate marker for early studies of glacial history. The prayers and religious processions to protest the glacier advances seem to have often coincided with the start of glacier stillstands or retreats, interestingly enough.

Ladurie describes 1596 to 1867 as the period of glacier imperialism throughout the European Alps, and his scrutiny of the contemporary texts and illustrations has led him to explore the Alps on foot to learn from field observations the exact location of past glacier positions from historical accounts. The retreat of the alpine glaciers beginning in the warm decade 1860–70 started shortly after the first glacier photographs began to be taken, so that there are some excellent illustrations in this book of the changed positions of the ice fronts. Series of early thermometric observations seem to bear a strong relationship to the glacier movements, with lag response times of less than a decade. This widespread retreat has lasted until the 1950's, but the return to cooler climate in the Northern Hemisphere since then has not been sufficiently marked until very recently to be treated at any length in this book, which was first printed in France in 1967.

To conclude, Ladurie has succeeded in presenting a wealth of primary climatic data to form a sound basis for subsequent studies of, for instance, the relationship of human history to climate, and in giving us in his own words "a climatic history with a human face."

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A Circle of Virtuosi

The Experimenters. A Study of the Accademia del Cimento. W. E. KNOWLES MIDDLETON. Johns Hopkins Press, Baltimore, 1971. xvi, 416 pp., illus. $22.50.

Middleton's book on the Cimento is something of a disappointment for the reader who has been led to believe in the key significance of 17th-century Italian scientific societies. The standard account of the role of this Florentine association is as a stepping-stone between the Roman Accademia dei Lincei (1603–1629) and the Royal Society of London (1660), each of which gradually channeled individual scientific curiosity into communal and systematic inquiry carried on in learned societies. Middleton's carefully documented account (the only one since Targioni Tozzetti's in 1780) concludes that the association of "experimenters" at the Medici court was more disorganized and less influential than has generally been supposed. With evidence aplenty, he demolishes the inflated claims about its uniqueness, power, reputation, and accomplishments that have so easily found their way into Italian accounts and unravels the complex chronology of this association's meetings and experiments. Only the specialist will want to follow Middleton into the thickets of details, but he can do so with great assurance of the reliability of the presentation. Middleton knows his primary sources extremely well, and more often than not lets them speak for themselves, in a faithful but readable English translation.

The gist of the story is that the Grand Duke of Tuscany, Ferdinand II, and his brother Prince Leopold each independently, when affairs of state permitted, performed experiments generally designed to refute Aristotelian physics. Records suggest that some experiments were begun as early as 1641, but the Academy cannot be said to have existed prior to 1657. The circle of virtuosi included Galileo's last pupil, Vincenzo Viviani, employed at court as an engineer; Giovanni Alfonso Borelli, the polymath professor of mathematics at Pisa; Ferdinand's physician Francesco Redi; and several other Pisan academics, Rinaldini, Marsili, and Uliva. Leopold's secretary, Segni, kept notes until 1660 and was succeeded by the young Magalotti, upon whom fell the burden of preparing the Academy's sole publication, the *Saggi di Naturali Esperienze* (1667). This small but active group met sporadically, principally in the summer when professorial duties were light, and occasionally in the dead of winter when it was possible to make use of the extreme cold for experimentation. Thermometers and barometers were their favorite instruments, though they also toyed with pendulums, magnetism, electricity, chemical reactions, and snakebites. According to the author, their work was extremely competent for the epoch, and in some cases quite original, though we know this only in retrospect. Failure to publish their findings or to communicate regularly with other circles of experimenters in London and Paris reduced their potential impact on the body of scientific information. Even when the *Saggi* finally appeared, some five years after the experiments, it made little impact upon the small but growing international scientific community. By that time, the Academy had split up following a serious falling-out between its two most intelligent and active members, Viviani and Borelli. The latter subsequently quit his post at Pisa, and two other associates also left Tuscany. Nine months after the last recorded meeting Leopold also left Florence to become a cardinal.

For all his contributions in setting straight many points of detail, Middleton has avoided very significant questions that did not occur to him because of the meticulous and focused character of his book. He makes no concerted attempt to assess the place of science in the Medici court, or to explain the lack of continuing interest in natural philosophy outside the tiny ring of experimenters. Middleton could throw a great deal of light on the relative popularity of literary and antiquarian pursuits so well described by Eric Cochrane, but he ignores the question completely. He has also shied away from dealing in depth with the impact of the Counter-Reformation on scientific pursuits in Florence, though this is an obvious component of the Cimento's peculiar character and demise. It would have been much more profitable to explore these realms than to devote one-half of the text to an—admittedly good—annotated new translation of the *Saggi*, which is nevertheless currently available in English in a decent 17th-century version. *The Experimenters* might thereby have been more balanced, and would have given the reader more for his money.

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