stitute of the Academia Sinica to move in such a fashion. The book provides interesting background material on the history of archeological research in China and on the work of the first generation of archeologists to work on Chinese civilization. It outlines the initial stages of Chinese field archeology, which grew out of revelations of the importance of fieldwork, advances in Chinese geological studies and textual research, and the finding of recognizable Chinese objects in historically known sites. The historical component of Chinese archeology is particularly strong, and the situation is comparable to that of Western Classical studies in many respects.

Two areas of Anyang were excavated—Hsiao-t'un, thought to be the administrative center, having yielded a corpus of inscribed oracle bones that constitutes one of the most important sources for studies of Late Shang history and religion, and the royal tombs of Houchia-chuang. Summary chapters on the architecture, art, religious system, social organization, and human remains are provided. Although many studies remain to be completed and several cannot be because of wartime losses and setbacks, the Academia Sinica in Taiwan has published a number of excellent site reports on various aspects of the excavations. I have always been puzzled that in the '50s and '60s so few young scholars on Taiwan were given access to the rich data of Anyang. The research team for more than 20 years has consisted of a few trusted elderly stalwarts.

Anyang provided the all-important starting point of Shang archeology. At present the geographic region of Shang sites extends from Liaoning to the south of the Yangtze River. The discovery of earlier sites, such as the Cheng Chou complex south of Anyang, has answered many questions concerning the origins and development of Shang civilization. Yet many interesting questions concerning Anyang remain. Was the site actually the capital, or was it a ritual center? In 1970, Ichisada Miyazaki noted the absence of a containing wall at Anyang (*Toyoshi Kenkyu* **28**, No. 4, 1). Cheng Chou, thought to be the capital before Anyang, has the remains of a pounded earth wall that is still 9.1 meters in maximum height and 36 meters in maximum width. The discovery at Anyang in 1976 of Tomb No. 5, which is not far from the center of Hsiao-t'un and dates to the early half of the 12th century B.C. (*K'ao Ku* **1977**, No. 3, 151 and No. 5, 341; *Wen Wu* **1977**, No. 11, 32) appears to confirm Ichisada Miyazaki's hypothesis that Anyang was a ritual center and that the capital, as recorded in the *Shih Chi* but not excavated, lay to the southeast at a point midway between the Hwang, Huan, and Ch'i rivers.

To bring his or her knowledge of Shang studies up to date from the point where Li's memoirs leave off, the English reader is fortunate in having *The Archaeology of Ancient China* by Kwang-chih Chang (third edition, Yale University Press, New Haven, 1977), *Metallurgical Remains of Ancient China* by Noel Barnard and Satō Tamotsu (Nichiosha, Tokyo, 1975), and the forthcoming *Sources of Shang History: The Oracle Bone Inscriptions of Bronze Age China* by David Keightley (University of California Press, Berkeley). For the reader of Chinese, there is also the provocative discussion of Shang marriage and descent groups (*Bull. Inst. Ethnol. Acad. Sin.* No. 19, 70 [1965], and No. 21, 38 [1966]) motivated by a paper by Kwang-chih Chang (*Bull. Inst. Ethnol. Acad. Sin.* No. 15, 65 [1963]) that has been partly translated as "Some dualistic phenomena in Shang society" (*J. Asian Stud.* **24**, 45 [1964]). Despite the great amount of information and new ideas these publications put forward, some of the old questions remain. What is the origin of the Shang chariot, or of some of the socketed bronze tools? Did the forms of human sacrifice originate outside China? Li believes that human sacrifice was a custom introduced through contact with the early Sumerians, from whom early China also learned about the wheeled carriage, some aspects of the technology of casting bronze, and something of the astrological sciences (p. 254). Linguistic connections between East and West have been studied by linguists such as Edwin Pulleyblank of the University of British Columbia; Pulleyblank has suggested "a number of impressive points of contact between the roots of Chinese and Indo-European" (*Pac. Affairs* **47**, No. 4, 505 [1974]). *Anyang* touches on these matters only rather indirectly. It is, however, a useful account of the early dedicated scholars and their exciting research by one of the persons in the very center of the action.

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Newton's Letters Completed

The Correspondence of Isaac Newton. Vols. 6 and 7. A. RUPERT HALL and LAURA TILLING, Eds. Published for the Royal Society by Cambridge University Press, New York, 1976 and 1978. Vol. 6, 1713–1718. xl, 500 pp. $65. Vol. 7, 1718–1727. xlviii, 522 pp. $65.

The time has come to celebrate the completion of a monumental enterprise that will surely stand for centuries to come. With the publication of these two last volumes, the project conceived in 1904 to print a modern edition of Newton's correspondence has at last come to a close. This work can now take its place next to the equally valuable volumes of correspondence of Galileo, Descartes, and Huygens. It is striking that this latest achievement is the only major one of its kind in the history of science to have been wholly executed in our century. Editions of the correspondence of Mersenne, Henry Oldenburg, the Bernoullis, Euler, Lavoisier, Darwin, Pasteur, and Einstein, each announced or in progress, and eagerly awaited, have yet to reach final form.

Those who only benefit from such monuments rarely appreciate the difficulties involved in their production. Beyond the obvious, burdensome labor of locating and transcribing letters, identifying persons, books, and events referred to in them, clarifying obscure language, and elucidating allusions, there are serious strategic problems. Because of the extended time involved from conception to production, each edition requires one or more competent, persistent, and devoted editors, an institutional basis to assure continuity and authority, and funding. The history of each major edition of correspondence is filled with obstacles running from the "normal" ones of world wars and economic crises to untimely deaths of editors and the petty jealousies among specialists that regularly slow its completion.

Though relatively free of the last of these, the Newton edition experienced its share of troubles. H. C. Plummer, the original editor appointed in 1939 by the Royal Society, which has constantly sponsored the work, worked intermittently through the war but died in 1946 before any portion of the edition was ready for the printer. The Newton Letters Committee of the Royal Society

selected as his successor H. W. Turnbull and obtained the assistance of its librarian, H. W. Robinson, and of J. F. Scott. The first three volumes appeared in 1959, 1960, and 1961. It was Turnbull who set editorial policy and launched the enterprise with the high standards that have been maintained by his successors. Scott took over the editorship on the death of Turnbull in 1961 and produced one further volume in 1967. Finally A. Rupert Hall was asked to carry on the task when Scott passed on in 1971. With the help of Laura Tilling, he completed the job with a volume each in 1975, 1976, and 1978.

Beyond the standard difficulties, the various editors suffered from the dispersal of the important Portsmouth Collection of Newtoniana, sold at auction in July 1936. Some of the items listed in the Sotheby catalog have yet to be located, and their absence insures that this is not, strictly speaking, a "complete" edition. Bibliophiles will surely turn up letters in the future. Already, in the last volume, the editors have been forced to provide an appendix of additions and corrections that runs 100 pages and adds close to 165 new items, bringing to around 1700 the total for the work as a whole. The publicity given to this edition and the cumulative knowledge of the seven editors and assistants do provide some assurance that it is nearly complete and that their work will not soon have to be done again.

The current editors, facing their own difficulties, have on the other hand been fortunate to profit from the forward strides made in Newtonian scholarship in recent years. Hall, one of the most accomplished historians of science in the United Kingdom, had already, with Marie Boas Hall, edited the *Unpublished Scientific Papers of Sir Isaac Newton* (1962) and many volumes of *The Correspondence of Henry Oldenburg* (since 1965). He was also able to benefit from the labors of the late Alexandre Koyré and I. Bernard Cohen, who produced a critical edition of the *Principia* (1972). Hall and Tilling, a gifted young historian of mathematics, received the much-needed cooperation of J. O. Fleckenstein, currently in charge of the Bernoulli edition. But, above all, the last two volumes lean heavily upon the expert work of Derek T. Whiteside, who is editing the monumental *Mathematical Papers of Isaac Newton* (since 1967). One can say that Hall and Tilling's task was much eased by cooperation among scholars, in the best of traditions.

The last two volumes under review deal with the elderly Sir Isaac, in his 70's and 80's. What do they reveal about him? He was clearly past his creative prime and was not even engaged in substantive correction of his editions of the *Principia* or the *Opticks*. The third edition of the former appeared the year before Newton's death, but the revisions demanded and received little serious attention from the aging philosopher. His exchanges with Henry Pemberton, who saw it through the press, are unenlightening when placed next to those with Roger Cotes, who had, two decades earlier (volume 5), led Newton into the important revisions for the second edition. In his declining years, Newton seemed somewhat more interested in his *Opticks*, which had first been published in 1704. A second French edition was being prepared in Paris by Pierre Varignon, who carried on a significant epistolary exchange with Newton from 1718 on. Throughout this exchange, Newton displays a greater concern with his continental reputation than with the validity of his assertions in the treatise. Indeed, the general impression garnered from the correspondence is that Newton had ceased to be interested in the growth even of his version of natural philosophy, which might be achieved by new experiments developed by disciples. In these pages, Newton comes through as a cogent but consummate egoist, primarily concerned with his welfare and reputation.

Nowhere is this more apparent than in the bitter exchanges over the priority of the invention of the calculus. Close to half of these volumes is taken up with the accusations, defense briefs, counter-accusations, challenges, and denunciations made by both principals and partisans and with maneuvers intended to save Newton and Leibniz from a direct confrontation. Seen from our vantage point the arguments do neither man credit. Leibniz was highly suspicious of the English, and Newton was unwilling to recognize his errors or failures to understand. The partisans on both sides were downright deceitful and inflammatory. Without John Keill fanning the flames on Newton's side, or Johann I Bernoulli furnishing anonymous texts and challenges, the debate might have taken on a more civil turn befitting the two great mathematical geniuses. In the letters, they emerge as mere mortals.

Historians' verdict that Newton's and Leibniz's discoveries were independent and differed greatly in conception and notation remains unchanged by the publication of letters and documents in this edition. But the accessibility of the exchanges reveals once again Newton's irascible character and the ease with which his pride was pricked. The editors treat the entire matter impartially, with copious informative notes. I was nevertheless disappointed to note the absence of a thorough discussion of the Leibniz-Clarke debates, since this issue was raised by numerous documents. The decision to exclude an annotated reprinting of the Leibniz-Clarke correspondence was made by Hall and Tilling in view of the existence of a recent edition by H. G. Alexander (1956) and because the documentation directly linking Newton to Clarke for this debate is no longer extant. Yet it is clear that Newton's reaction to Leibniz on the calculus issue and Leibniz's views of the English were strongly colored by this parallel debate. It weakens the value of the edition to have discussion of the debate relegated to another book, however reasonable that decision may have seemed.

There is surprisingly little to be learned about Newton's involvement with either alchemical or religious matters. One wonders if the recent excitement among scholars with these aspects of his career is inordinate, or if Newton acted simply out of prudence in refraining from communications about them. But there is nothing here to confirm what rationalists of the early 19th century once claimed, that Newton's excursions into alchemy or theology were the product of senility on his part. He remains throughout lucid and rational, particularly in his handling of affairs at the Mint and as commissioner of the Admiralty for prize submission to determine longitude at sea. His behavior may at times have been haughty or testy, but he remained in full possession of his senses to the end.

Another remark about Newton's activities also emerges from a reading of these volumes. One would have expected that an individual recognized for his major contributions to natural philosophy would make a concerted effort to spread his doctrines by urging university appointments for friends, encouraging popularizers, and attracting disciples. A loosely knit group of sympathizers did exist, but these Newtonians were more concerned with protecting Newton's reputation than with furthering or elaborating on his scientific principles. One recognizes here more a cult of personality than the establishment of a research program. It makes one believe Newton was the last of the ancients rather than the first of the moderns.

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