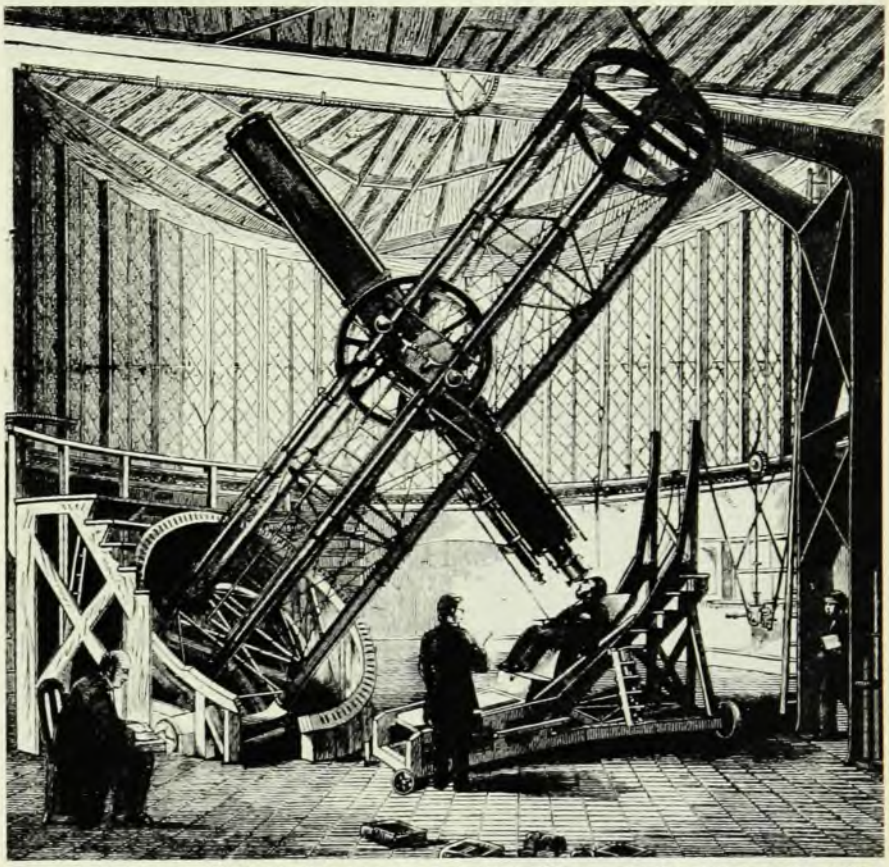
Great Flamsteed's ghost! 300 years for Greenwich

Greenwich Observatory: Vol. 1, Origins and Early History; Vol. 2, Recent History; Vol. 3, The Buildings and Instruments.

E. G. Forbes, A. J. Meadows, D. Howse
204 pp., 135 pp. and 178 pp., respectively. Scribner's, New York, 1975. $60.00 per set

Reviewed by Arthur L. Norberg



Equatorial telescope (12.8 inches) in operation at the Royal Observatory, Greenwich, in the 1860's. The engraving, from the 1880 edition of E. Dunkin's *Midnight Sky*, appears in volume 3.

These three volumes, each by a separate author, appeared as part of the tercentenary celebration of the Royal Observatory, Greenwich. Chartered in 1675 by Charles II, the Royal Observatory is the oldest continuing scientific institution in England. Volumes 1 and 2 relate the Observatory's history from the perspective of the Astronomers Royal and the staff, and Volume 3 chronicles the history of its instruments. The books admirably cover the 300-year history, but the authors rightly make no pretense of definitiveness.

Interestingly, the Royal Observatory's history can be divided into two natural stages on two different grounds. On the one hand, the first 160 years (1675–1835) were dominated by individual men, the sequence of Astronomers Royal, and the instruments each had for research; on the other hand, in the last 140 years the Observatory has operated more as an institution. From another perspective, by 1835 Greenwich's management was a morass, and a strong leader was needed to redirect it. Eric G. Forbes treats the first period in Volume 1, and A. J. Meadows portrays the second in Volume 2.

Forbes has written extensively on the history of astronomy from the 16th to the 19th century. His work includes discussions of Tobias Mayer and his lunar tables and John R. Harrison and the marine chronometer. Most recently, he has edited the papers and lectures of John Flamsteed, the first Astronomer Royal. Also, Forbes has indexed the papers of the British Board of Longitude. All these topics appear in Volume 1.

When considering the founding of Greenwich, Forbes analyzes the navigational needs of sailors, the attitude of the governmental figures involved, and the scientific background of the period to give a picture of what was possible. When discussing developments at the Observatory, he gives a full picture of the quality of leadership, astronomical abilities of, and external difficulties faced by, each of the first six Astronomers Royal. Thus we learn of Flamsteed's observing and reducing techniques, his problems with funding instruments, and his encounters with Newton. There is a rehearsal of the facts surrounding Maskelyne's establishment of the Nautical Almanac Office, as well as an analysis of the Board of Longitude's interaction with the Observatory staff, and the reasons for the Observatory's decline during John Pond's tenure as Astronomer Royal are set forth.

Forbes is not satisfied simply to tell the story of the Observatory's accomplishments; he follows the trail of observations until they were reduced and became useful in later astronomy. One prominent example is Bradley's observations, taken between 1742 and 1762. Forbes details the reasons for the long delay in their publication—they appeared in 1798 and 1805—and reflects on the brilliant analysis of them by Friedrich Bessel (1818). The bulk of Forbes's discussions tends to be narrowly technical, during which he is at his best, and the overall arguments are tightly woven.

In his preface to Volume 2, Meadows points out that somewhere in the prepublication planning different instructions were given to him and Forbes, which resulted in two decidedly different perspectives. Meadows has written for a wide audience, in a vein similar to his earlier biography of Norman Lockyer. Perhaps Forbes's volume is more satisfying to practitioners and historians of the physical sciences.

Considering the increasing complexity of the Royal Observatory's activity since 1835, this accidental difference may have resulted in a better volume. Meadows' summary provides the background for future detailed studies in the Forbes style without diluting the Observatory's exciting history.

Meadows divides the history of the period into four subjects—Observatory staff, positional astronomy, longitude and time, and astro- and geophysics—and analyzes developments in each chronologically. The picture is broadly painted, but the view is clear. From a small observatory run by a small staff, the Greenwich Observatory was transformed into a formidable institution. There is heavy emphasis on the nineteenth century, especially the years of George B. Airy.

Volume 3, by Derek Howse, is a mine of information about the buildings and instruments used at Greenwich. Howse is Curator of Astronomy at the National Maritime Museum, Greenwich, the agency responsible for the old Observatory grounds. As such he was intimately associated with the renovation of Greenwich Observatory buildings to reflect their original use and is very knowledgeable about the Museum's astronomical collections. His presentation includes a description of each instrument, a summary of the method of use, an historical resume of accomplishments achieved with it, and references to contemporary accounts. All the volumes are illustrated, but special care was taken with Volume 3 to portray the instruments.

It is well known that Greenwich in its 300-year history has had an important impact on astronomical developments throughout the world. These books convey some of the excitement of that history.

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Collective Phenomena and the Applications of Physics to Other Fields of Science

N. A. Chigier, E. A. Stern, eds.
491 pp. Brain Research, Fayetteville, New York, 1975. $25.00

The papers and abstracts published here are the result of an independent seminar organized by a group of dissident Soviet scientists and cancelled by the authorities; most of the papers had been submitted beforehand. Since no specific reason was given for the suppression of the meeting, one is left to draw one's own conclusions. The majority of the Soviet scientists involved in the unofficial conference had applied for emigration to Israel, and subsequently lost their employment as scientists. The conference thus represented a means of maintaining their scientific validity after official outlets had been closed. More than 100 scientists from all over the world contributed papers,

Russian dissident scientists (Mark Azbel on right) listen intently at "Sunday seminar" in Moscow apartment, 1975. (Photo, P. Pershan)

and eight Nobel Prize winners were among the sponsors.

In the preface, Alexander Voronel gives the background of the meeting in a compelling manner: "... after a fortnight's meditation in the cells and prisons around Moscow, it is seen that the solidarity of scientists is greater than the state frontiers that divide us and stronger than direct political pressure ... and that direct contacts of scientists and scientific freedom [can] no longer depend only on the political interests of governments ... a precedent has been created for informal contact between Western and Soviet scientists which can hardly be ignored ...."

The diverse nature of the program included the closely related sciences of physics, chemistry and mathematics (35 contributions) as well as biology (29), cybernetics–modelling–game theory (26), sociology (ten), economics (six) and a so-called "general" section, which consisted of 11 other papers of great diversity—from "Life in the Universe" to "Quest of New Scientific Methods for Archeological Problems." Altogether there are over 100 papers of variable length, averaging about five pages per paper. Sadly, we have only one-page