

Henry Ussher and the Early History of Dunsink Observatory: A Bicentennial Note

IAN DUFF

26 Gordon Avenue, Church Crookham, Fleet, Hampshire

A short account of Henry Ussher's life and work. It encompasses his election by Trinity College of Dublin University as first Andrews Professor of Astronomy in 1783, his part in the foundation of Dunsink Observatory and his work there until his death in 1790.

INTRODUCTION

The year 1783 may best be remembered by most people as that in which Britain was forced to recognize the independence of her American colonies at the peace of Paris. It was also the year in which the Rev. Henry Ussher (1740–90) was appointed first Andrews Professor of Astronomy at Trinity College, Dublin. This appointment, on 1783 January 22, preceded the foundation of Dunsink Observatory at which Ussher was the first of a line of distinguished astronomers to hold the post of Director.

There is strong evidence that astronomical work commenced at Dunsink on 1785 August 25, and 1985 is the year that has been chosen to commemorate the 200th anniversary of the observatory¹. Since, however, Henry Ussher played a leading role in the planning, building and establishment of the observatory it seems appropriate to summarize this aspect of his life and work in a short paper at this time.

Henry Ussher was born in 1740, the fourth son of Samuel Ussher. He was a direct descendant of Arland Ussher, the father of two prominent religious scholars of the seventeenth century, Archbishop James Ussher and Ambrose Ussher; the former, having founded the great library of Trinity College, is notorious to this day for his calculation that the date of creation was 4004 BC October. Henry Ussher won a scholarship to Trinity College, Dublin, in 1759, taking his degree some two years later. He was made a Fellow in 1764 and became a Doctor of Divinity in 1779². Ussher married Mary Burne and they had several children, one of whom was later to become Sir Thomas Ussher, notable as the naval captain charged with taking Napoleon to Elba to begin his exile. In 1781 the Rev. Henry Ussher was made a Senior Fellow at Trinity College and in 1783 was appointed to the newly created Chair of Astronomy, the post he was to hold for the remaining seven years of his life.

THE ANDREWS CHAIR OF ASTRONOMY AT TRINITY COLLEGE

Francis Andrews, a former provost of the College, bequeathed in 1774 a sum of £3000 for the establishment of an observatory and Chair of Astronomy at Trinity College. He also allocated £250 per year to provide for the salaries of a Professor of Astronomy and any such assistant as might be appointed.

Unfortunately, the will was disputed by disappointed members of Andrews' family and the affair was eventually settled only after being referred to a Parliamentary Committee³. This settlement materially reduced the sum available from the bequest, in addition to delaying for several years the first definite steps to acquire a suitable site and begin construction of the observatory.

USSHER'S PART IN FOUNDING THE OBSERVATORY

As a Senior Fellow at Trinity College, Ussher was almost certainly involved in the preliminary work to choose a site and begin initial planning of the observatory. On 1782 December 10 a contract was placed with one Graham Moyers for building the observatory on the hill at Dunsink, about 6.5 km from Dublin and some 86 metres above sea-level. The site was chosen by Ussher to be as far as possible from Dublin, while still allowing access by students from the University. It provided good foundations for the observatory with a fine view in most directions, especially to the south.

On 1783 January 22 Ussher was formally appointed first Andrews Professor. Whilst work was progressing on the construction of the building he paid a visit to London, going to Greenwich Observatory, which by then had been in existence for just over 100 years, and also to see two well-known and skilful instrument-makers—Jesse Ramsden and John Arnold. By the

time of Ussher's visit Ramsden has been established as an optician and instrument-maker for over 20 years, producing high-quality transit instruments and circles. Ussher subsequently ordered a 100 mm transit telescope and a vertical circle which was to be the largest so far constructed, 3 metres in diameter. He also ordered two astronomical regulators from Arnold, a well-known clockmaker. (The history of these clocks is of interest and well documented elsewhere—see reference 4.)

Work proceeded quickly on the observatory's construction and in 1785 Ussher published a detailed account of the choice of site and design of the building in a paper read to the Royal Irish Academy, a body founded at the same time as the Andrews Chair of Astronomy. The building as described and shown in plans drawn by Ussher in this paper, the first *Transaction* of the Royal Irish Academy, is much the same as it stands today except that the north and south passages shown, with small domes, were never built.

The major building is a plain, two-storey structure facing east and surmounted by a dome for the main telescope. Another room projecting to the west of the main building was built for the meridian instruments, this position being carefully chosen by Ussher so that smoke from the chimneys would blow in the opposite direction. The main dome had a pillar going down to solid rock without anywhere being in contact with any walls or floors of the observatory. The transit instrument was to be supported on two blocks of Portland stone, chosen as a matched pair in the quarry in an attempt to ensure equal thermal characteristics³. The design and construction of the transit room was considered in detail by Ussher who provided large



Figure 1. Henry Ussher.

Quod felix faustumque sit!
Dunsink
August 25 1785. H. U.

Figure 2. Ussher's initial entry in the 'Miscellanies' volume.

observing apertures controlled by shutters, much as used at Greenwich, and also had them fitted with fine canvas screens to reduce, but not eliminate, the air flow. The observatory buildings included spacious accommodation for the resident astronomer, and stables and stalls were also provided, together with extensive gardens. A small house was provided for the assistant and, in all, the observatory site encompassed over 5.5 hectares (14 acres). A water supply at the site was a problem from the start—a deep well was bored which provided a good supply which was not, unfortunately, always of the purest quality, since in later years Professor G. J. Joley, a Dunsink astronomer, apparently died from typhoid as a result of contamination of the well water by sewage³.

ASTRONOMICAL WORK COMMENCES AT DUNSINK

Shortly after his paper describing the observatory's design was read to the Royal Irish Academy, Ussher arrived at Dunsink Observatory to take up residence. This would appear to have been on 1785 August 25, since a volume of miscellaneous early observations begins with a title-page (figure 2), on which is inscribed²:

Miscellanies

Quod felix faustumque sit!

Dunsink

August 25: 1785. H:U:

Initial observations were carried out with a temporarily mounted 1.2-metre transit instrument from Greenwich, these and other observations, both astronomical and meteorological, being recorded in the 'Miscellanies' manuscript book which Ussher maintained until his death in 1790.

The instruments ordered for the new observatory were to be 'without limitation of price' by the Board of Trinity College and the first of these, the 100 mm transit telescope, was mounted in the transit room between the two large pillars of Portland stone. Three eyepieces were provided, the most powerful giving a magnification of 600× and the mode of illumination

of the cross-wires was derived by Ussher, he having persuaded Ramsden to use light directed from a small lamp *via* the hollow tube axis, rather than through the objective. Details of instruments, and descriptions of their use and results, were communicated *via* the Transactions of the Royal Irish Academy.

The other instrument ordered from Ramsden by the Board, following Ussher's visit to London, was to have been a very large 3-metre diameter circle. In the event, however, this ambitious project ran into various problems. The circle was reduced from 3 to 2.7 metres after difficulties were experienced and then further, to 2.4 metres diameter⁵. The technical problems brought delays and Ussher never lived to see the circle installed. Ramsden himself died in 1780, the circle being finished by Matthew Berge and delivered to Dublin in 1808, some 25 years after being ordered⁷.

The two clocks ordered from Arnold, and one by Crosthwaite, were in use at the observatory in Ussher's time. One Arnold clock sufficed for both the transit telescope and the vertical circle in the Meridian Room, Ussher writing in his description of the observatory read to the Royal Irish Academy in 1785 that this was "... a circumstance of some economy, where the price is eighty guineas".

In 1788 Ussher began recording observations in a 'Transit Book', covering the period from 1788 January 1 to 1790 May 5, only some three days before his death. It contains observations made with the transit instrument, details of weather conditions, and remarks about the condition and performance of the

various instruments. He also recorded a detailed description of the Ramsden transit telescope, notes on the determination of the intervals of the wires and the variations in clock rates^{6,2}.

In addition to the work carried out with the transit instrument, Ussher made a series of longitude determinations for Dunsink and various other locations in Ireland. A young pupil was Francis Beaufort, subsequently Hydrographer of the Royal Navy. Ussher also recorded several auroral displays visible from Dublin, mean right ascensions and north polar distances of fixed stars, and some observations of double stars. It would also appear that rockets were used for comparison of clocks at Dunsink and Drumcondra since recipes for explosive mixtures for these rockets were recorded in the Transit Book³ (figure 3), in which was recorded material on which Ussher based his papers which appeared as *Transactions of the Royal Irish Academy*.

He appears to have lived very much in some academic, and perhaps social, isolation at Dunsink, although in the latter part of 1789 his advice was sought on the lines of the new observatory shortly to be constructed at Armagh, and he travelled there to discuss the matter².

HENRY USSHER'S DEATH AT DUNSINK

It seems probable that his work at the observatory and the isolation there hastened his death on 1790 May 8 at the early age of 50. He died with the observatory still lacking essential instruments and it was left to his successor, Brinkley, to commence systematic fundamental observations. Ussher's achievement was in establishing the observatory, and contending with difficulties caused by a paucity of equipment. His efforts were, however, recognized by the Board of Trinity College who recommended that Ussher's widow be granted a pension, amongst other tokens of appreciation.

Subsequent Dunsink astronomers had an honour that was never granted to Henry Ussher, that of holding the office of Astronomer Royal for Ireland. This title was established by Letters Patent from George III in 1791, the year following Ussher's death, and from that date was conferred on the Andrews Professor of Astronomy at Dunsink Observatory, the last holder being Henry C. Plummer, Andrews Professor 1912–21.

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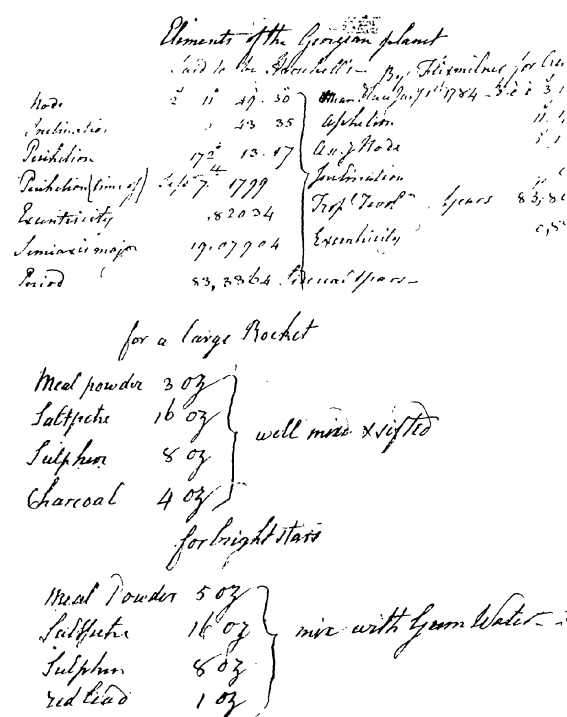


Figure 3. Entry in the 'Transit Book'. Ussher's notes on the 'Georgian Planet' and his recipes for rocket mixtures.

REFERENCES

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Affiliated Societies

The Lancaster and Morecambe Astronomical Society was formed in 1978 January, and affiliated to the BAA in the same year. Through that affiliation, observations have been forwarded to the Mercury and Venus, and latterly Terrestrial Planets Section as well as the Lunar, Meteor and Aurora Sections. In addition, members who are also individual members of the BAA have contributed to other Sections.

Through monthly meetings featuring members' news, beginners' classes and guest speakers, the Society caters for local interest while attracting regular visitors from as far afield as Wigan, Preston, the Fylde peninsula and Kendal. The Society also publishes a monthly journal, *Reflection*, and has directly encouraged observation through observing evenings held at members' homes. Many members have their own telescopes and some are skilled in making them. A 450 mm reflector and 150 mm folded refractor are soon to join twin 225 mm astrographs as part of a co-operative

venture being carried out by members Denis Buczynski and David Greenwood.

The Society enjoys links with the neighbouring Furness and Preston and District astronomical societies. Three one-day symposia jointly held with the latter have been devoted to the presentation and discussion of primarily observational subjects including the Solar System and variable stars. The fourth such symposium is to be devoted to stellar observation, and discussion will include H α observation of the Sun, open clusters and the detection of supernovae in other galaxies. The Society has also acted as host to the "1982 Astronomy in the North West Meeting", an event begun in 1981 in Preston.

The Society takes an interest in local astronomical history with studies having been made of Lancaster's ruined Greg Observatory and the Society's immediate predecessor, the Lancaster Astronomical and Scientific Association. It is expected that documents will allow astronomical activity in the area to be traced back to at least 1835 so though a relatively new society, we are carrying on activities well established in the area.

Peter Wade

Affiliation to the British Astronomical Association

1. Affiliated Membership

Scientific Societies, Schools and other educational establishments may apply for affiliation to the Association.

"School Societies" are regarded as schools, not societies. The body affiliated is the school; limiting the benefits to a society is a matter of internal school organization.

Formal application for affiliation should be sent to the Secretary for submission to the Council, and for their information should include the number of members, a list of officers, and the place and frequency of meetings. In the case of a school it must be accompanied by the written consent of the headmaster or headmistress.

2. The Obligations of Affiliation

The affiliated body is required:

- (a) To pay an Annual Subscription of £18.70 due in advance on August 1.
- (b) To support the objects of the Association, which is an association of observers for mutual help, for the

circulation of information and for the encouragement of popular interest in Astronomy.

3. The Benefits of Affiliation

The affiliated body:

- (a) Will receive for their clubroom one copy of every publication distributed free to members (large societies may like to obtain more than one copy by application for the current rate as agreed by Council).
- (b) May delegate a limited number of their members to attend meetings of the Association.
- (c) May, through its Secretary, seek the advice of Directors of Sections.
- (d) Societies, etc., in the United Kingdom may, through their Secretaries, obtain a loan of books, projector slides, and instruments; the Secretary being responsible to the British Astronomical Association for the safe custody of Association property.
- (e) Is invited to submit contributions to the *Journal* and to the annual exhibition of members' work.

4. Individuals in Affiliated Societies

Individual members of the affiliated body are not, by virtue of affiliation, members of the British Astronomical Association, and are not eligible to hold office therein.