

REPORT  
OF THE  
ASTRONOMER ROYAL,  
TO THE  
BOARD OF VISITORS,  
FOR THE YEAR  
1840.



# REPORT OF THE ASTRONOMER ROYAL

TO THE

## BOARD OF VISITORS,

*Read at the Annual Visitation of the Royal Observatory, Greenwich,  
June 6, 1840.*

IN pursuance of the custom which I have followed for four years, I beg to lay before the Board of Visitors a Report on the general state of the Royal Observatory. I propose to follow nearly the same order as in preceding years; as the heads under which I have been accustomed to arrange my statements, appear to comprehend everything (in addition to the matter contained in the printed Volumes of Observations) which is of interest to the Board of Visitors.

1. Grounds and Buildings.—In the Report read to the Board at the last Visitation, I stated that steps were in progress for the construction of a fire-proof room in one side of the old Quadrant-Room (as recommended by the Board at the meeting preceding the last), and for the formation of a covered passage from the dwelling-house of the Astronomer Royal to the Observatory. These works were completed in the last summer. A set of iron shelves has been mounted in the fire-proof room, for the support of manuscript books, &c.: it was found necessary in the last winter to conduct a stove-pipe through the room, as the only way of keeping the books, &c. dry in the alternations of temperature at that season; but it is conceived that this is done without danger to the contents of the room. The passage is found to be not only of great convenience but also of very great utility. Indeed, it is impossible to estimate how much more frequent will be the visits of the head of any establishment to every part of the offices subject to him, when, instead of encountering the inclemencies of weather in order to reach the nearest of them, he is able to pass through very nearly the whole without involuntary exposure.

No other addition has been made to the buildings, except the covering of a small

square at the entrance of the North Terrace, so as to form a sheltered space, in which boxes of instruments, &c. may occasionally be placed. The want of such a shed had often been felt.

Within the last year, the attention of the Civil Architect of the Board of Admiralty has been called to the state of the North Terrace wall. The wall, probably from an injudicious mode of building and from the effects of water and frost, has bulged out considerably; and the foundations, not only of the wall but also of the whole of the northern and western faces of the house and of the court-wall, have been completely exposed. This appears to have arisen from the gradual crumbling down of the steep hill, assisted as it is by the continual treading of the enormous number of persons, who, on every fine day, are walking beneath the terrace wall. The Civil Architect proposes, as I believe, to recommend that the wall be rebuilt, and that a portion of the walk below be completely paved, as the only way of preserving the foundation of this venerable building.

At the last meeting of the Board I was desired to procure information relative to the place of Flamsteed's well. I have communicated on this subject (indirectly) with Mr. Taylor, formerly First Assistant at the Royal Observatory; and with Mrs. Storey, daughter of Dr. Maskelyne. From the former I have received only an expression of full confidence that no such well was ever discovered; by the latter I am assured that such a well was discovered, but was closed so quickly that even Dr. Maskelyne himself did not see it. With regard to the locality, I apprehend that no more certain information can be obtained than that deduced from the accurate plan left by Flamsteed (and published by Mr. Baily, in his *Account, &c. of Flamsteed*), from which it appears to be exactly at the meeting of two walls, bounding what are now called the Drying Ground, and the Middle Garden.

I have this day received a communication which seems to require the distinct attention of the Board. The proposal of conducting a railway to Chatham, through the bottom of the Park, having been given up, another plan has been formed for carrying a railway across Blackheath, approaching very near to the south-western corner of the Park; and the plan has this day been sent to me by the engineer (Mr. Vignoles), with a request that I would lay it before the Board for their consideration, as the representatives of the astronomical interests of the Observatory.

2. Moveable Property in general.—In regard to the state of our moveable property, I have nothing whatever of the smallest importance to communicate to the Board. I may, however, call the attention of the Board to the circumstance, that I have made a comprehensive catalogue of the whole of the moveable property belonging to the Observatory, including, and thus tending to secure, a great number of valuable articles not included in the former catalogues.

3. Manuscripts.—With regard to the manuscripts, I have only to communicate that all have been removed to the Safe Room ; and, having been marked (as I stated in my last Report), they have been placed in the first degree of rough arrangement. No other step has yet been taken to the formation of a catalogue.

In connexion with this subject I may remark, that it seems desirable that our shelves of manuscripts should contain copies of documents of every kind bearing upon the history of the Observatory. In this regard, as well as for my own guidance and for the information of my successors, it appears advisable that a copy of the Minutes of the Meetings of this Board should be found at the Observatory ; and I would, therefore, respectfully submit, whether the Board may be pleased to take into consideration my request, that a copy of these Minutes be deposited here.

4. Library.—With regard to the Library, I have nothing to communicate, except that additions are occasionally made, tending to keep it up to the present state of astronomical science. The catalogue, to which I alluded in my Report of 1838, is also kept up.

5. Instruments.—No change has been made in our important instruments, although some small alterations have been made in the subsidiary parts. To the Sheepshanks Telescope there has been attached a double-image-micrometer (for the measures of planets, double stars, &c.), consisting of a four-glass eyepiece, with the second lens divided, and one of its segments carried by a micrometer screw. In the division of the declination-circle of the East Equatoreal, a small error has been discovered in one quadrant, arising (it appears) from a weakness which was not observed till that part of the graduation was completed: this is to be examined, and, if necessary, to be redivided. Having found that some irregularities in the indications of the Zenith Tube appeared to be always referable to irregularities in the observation of the lower plumb-line microscope, I conceived it probable that they might be produced by rotation of the plumb-bob ; and I have, therefore, lately suspended the plumb-bob upon a bar carried by two parallel plumb-lines : this plan effectually prevents the twist of the wire, and does not appear likely to interfere with its vertical position, but I know not whether it may introduce other inconveniences. It was very lately found necessary to separate the lenses of the Transit object-glass for the purpose of cleaning them ; and after reuniting them, with a less severe pressure than before, the focal length of the telescope has been sensibly shortened ; its general action, however, appears to be improved. Jones's Circle having been sent to the Cape of Good Hope, as mentioned in the last Report, one circle only has been used. The Cape Circle has been received, and is at present mounted under the new shed, with a sort of fühl-hebel acting upon its steel collar, for the examination of the form of the collar ; some observations directed to that end have been made by Mr. Main, but our continued employment

has prevented us from completing them. With the Cape Circle Mr. Maclear sent its telescope, remarking, at the same time, that its telescope was much superior to that of Jones's Circle. I, therefore, thought it advisable immediately to return him the Cape telescope, for mounting on Jones's Circle. The old Hardy's escapement of the Transit Clock was demanded by the Board of Admiralty, and has been sent to them accordingly.

At the last Meeting of the Board I was desired to consider the facilities or advantages of managing the raising and dropping of the Time Signal Ball by clock-work. I duly considered this matter, and, ultimately, communicated my opinion upon it to one of the Members of the Board; who, as I believe, is disposed with me to abandon the idea. I shall be happy to explain to the Members of the Board the reasons upon which this conclusion is founded.

6. Observations.—The principal observations have been the following. With the meridional instruments: regular observations of the Nautical Almanac Stars; of the Sun, Moon, and Planets, at every practicable opportunity; of Moon-culminating Stars; of stars pointed out by Mr. Baily and Col. Colby (the latter list now finished); of low stars for refraction; of stars which had been observed with the equatorials; and of 61 Cygni as often as possible in 1839. With the equatorials: observations of Mars and neighbouring stars in 1839; observations of two comets in the last winter; of transits of the Moon's diameter; and other occasional observations. With the Zenith Tube: regular observations of  $\gamma$  Draconis. With the double-image-micrometer: observations of a catalogue of circumpolar double-stars, for examination of their relative parallax; also, of the diameters of the principal planets. With the detached telescopes and equatorials: observations of occultations of stars by the moon, and of eclipses, &c. of Jupiter's satellites. The quarterly observations relating to meteorology and magnetism have been made as in 1839.

7. Reductions.—The state of reductions is nearly as follows. The Circle work for 1839 is completed, all corrections of every kind having been applied to the observations, and the definitive catalogue of N. P. D., and definitive errors of the planets in N. P. D. having been formed. I may remark, as a circumstance of which I can offer no certain explanation, that the latitude deduced from numerous observations in 1839, agrees closely with that found in 1838 and 1837, but differs a quarter of a second from that found in 1836; a greater error than, in my judgment, can be ascribed to the observations. The Transit work for 1839 is equally completed, except that the definitive catalogue is not written out. The combination of errors of R.A. and N. P. D., for investigation of the position of the ecliptic, is finished, (giving results nearly similar to those of 1838); that for the formation of errors of longitude and latitude, geocentric and helio-

centric, is advancing. The observations with the Zenith Tube are reduced. The observations with the Equatoreals are partly reduced. Since the last Report to the Board it will be perceived that we have gained upon our reductions.

At the last Meeting of the Board, I was desired to take an opportunity, when possible, of collecting sets of the skeleton forms in use at the Royal Observatory, for the purpose of binding with the Observations. Since that time only two forms have been reprinted, of each of which 250 copies have been retained. The Board will speedily decide whether it is better that these should be attached to the forthcoming volume, or that we should wait till a greater number has been reprinted. As most of the forms are bound in books, it would not, I conceive, be the wish of the Board that any of the books should be destroyed for this purpose.

8. Printing.—The state of the printing will be seen from the proof sheets exhibited. In the Transit department it is nearly as forward as the state of copy for press admits; in the Circle department it might be more forward; but there is every prospect of the volume for 1839 being issued rather more early than usual.

The Board having desired, at the last Meeting, that copies of the Astronomer Royal's Annual Reports should be attached to the Volumes of Observations, I beg to point out that this direction has been complied with in the printing of the volume for 1838.

9. Chronometers.—The work relating to Chronometers has, in the spring of the present year, been unusually severe; more than eighty chronometers having been on hand, for daily comparisons, through nearly the whole time.

As a general remark, I beg to state, that the personal establishment, in its present state, appears competent to the work which may reasonably be expected from the Observatory; I do not mean that we can always go on well without some assistance, or that the troublesome business of superintending the reduction of former observations, and of conducting the current inquiry relating to standards of weight and measure, can fail to obstruct our work in some important regards: but I mean, that we are sufficiently provided in regard to that part of the work for which permanent Assistants are wanted, namely, the regular observations; in regard to computations, occasional assistance of unattached persons may be conveniently used. The Board of Admiralty, at my representation, have been pleased to grant me the assistance of a computer for one year; and it is owing almost entirely to this addition of strength that I have been able to bring the reduction to a more advanced state. With similar assistance when needed, I hope to have no occasion for permanent assistance.

G. B. AIRY.