[From Chambers' Edinburgh Journal.]

The Royal Observatory at Greenwich.

It is fair to suppose that but few persons in this country are ignorant of the existence of the institution whose name stands at the head of these columns. Some, during a visit to London, and while sauntering in Greenwich Park, may have seen its exterior. Others, again, have read of it in books of voyages, or seen the words printed in the margin of maps, as the point from which longitude is reckoned. But very few possess any definite idea as to the nature of the operations carried on within it; of the patient watching, amounting to severe labor, in conducting the extensive, various, and delicate observations for which it has long been celebrated; or of their high importance in a scientific and commercial point of view.

These points are, however, ably elucidated in the annual report for the present year of G. B. Airy, Esq., the astronomer royal, which, while it explains the satisfactory state of the scientific proceedings, contains also some general notices that may enable the great body of readers to comprehend the more than national value of such an establishment.

It would not be out of place to give, before proceeding farther, a brief history of the building, which is erected on the top of a gravelly hill in Greenwich Park, on the site of the ancient tower built by Duke Humphrey in the reign of Henry VI, commanding a fine and impressive view over the smoke-shrouded city, the flowing river alive with vessels, and the fertile plains of Essex. It was built by order of Charles II, who, with all his levity, seems to have been aware of the importance of science: the first stone was laid by Flamsteed, who had been appointed astronomer royal in August 1675, and no delay took place in its completion and furnishing it with accurate instruments. By the words of Flamsteed's commission, he was directed 'to apply himself with the utmost care and diligence to the rectifying the tables of the motions of the heavens, and the places of the fixed stars, in order to find the so-much desired longitude at sea, for perfecting the art of navigation.' With what success this has been done, may be inferred from the remarkable words of Delambre, who, writing on the four volumes of observations by Maskelyne, astronomer royal at the commencement of the present century, observes, 'that if, by a great revolution, the sciences should be lost, and that this collection only were saved, there would be found in it materials sufficient to rear almost an entire new edifice of modern astronomy.'

The whole establishment comprehends two principal buildings, one the observatory, the other the dwelling-house; the former is a low oblong erection, placed east and west, with four principal apartments on the ground-flour, in which the most important observations are carried on; in one of these, which has a double sloping roof fitted with sliding shutters, for convenience in observing transits, is the transit instrument, eight feet in length, resting on two stone pillars, and interesting from having been used by the astronomers royal from the days of Halley.

In an adjacent apartment is the magnificent mural circle by Troughton, which was placed on its stone pier in 1812, and although it has a diameter of nearly eight feet, such is the accuracy with which it has been constructed, that its position may be ascertained to the tenth of a second. In the other rooms are other circles, and a variety of astronomical instruments, as well as a library containing many scarce scientific books.

It is, however, beyond our province to attempt a description of the splendid and complicated instruments contained within the observatory, which we should scarcely succeed in making intelligible to the general reader; suffice it to say, that the establishment is supported at the expense of government, and is under the direction of the lords of the admiralty.

Astronomical time is not divided, like civil time, into two periods of twelve hours, but is counted regularly from one to twenty-four. Now, it is one of the most important objects in the duties of the observatory to find the true time; this is ascertained at Greenwich by accurate determination of the places of various stars, and their transit over the meridian.

From these observations the mean solar time is computed; and this once known, the finding of the longitude of any place is comparatively easy.

A knowledge of the true time being of the highest importance in keeping the reckoning of a ship on a voyage, the lords of the admiralty determined, about ten years since, on a means for making known daily the hour of one o'clock.

Such is the skill displayed in the observations, that this hour is now ascertained with the utmost nicety, and from the summit of the building has been made known with the greatest regularity from the time the plan was first adopted.

Every day, at five minutes to one, the captains of vessels in the river, within sight of the observatory, may be seen directing their telescopes towards a black ball slowly rising on a pole fixed on the roof of its north-western angle; they then prepare their chronometers, and keeping their attention fixed on the ball which has become stationary at the top of the pole, they note the instant when it begins to descend; at that instant it is one o'clock; and it will be obvious that the mariner has then the opportunity of knowing whether his chronometer is fast or slow; he may set it to the true time, and, by daily observation of the descent of the ball, ascertain its rate of going.

There is an apartment in the building appropriated to chronometers. It is the custom with makers of those instruments to send them to the observatory for correction or trial. Their daily rate is then observed, and noted down for the use of the owners; the same course is followed with the chronometers of ships lying in port.

Visitors to Greenwich Park may frequently see a captain descending the hill with his timekeeper in a handkerchief under his arm. The present number of chronometers on trial exceeds one hundred, many of them being from government ships paid off, and thirty in preparation for the determination of the longitude of Valentia in Ireland.

Another very important object in the institution and maintenance of the observatory, is the observations of the moon, and the determination of the places of fixed stars necessary for ascertaining instrumental errors arising in those observations.

In the early history of the building, these were regarded as secondary, but they appear to have been followed up with the greatest regularity, even when all others were neglected.

The effect of this regularity is most honorable to the institution; for the existing theories and tables of the moon are everywhere founded on the observations at Greenwich, which is looked to as that from which alone adequate observations can be expected; and it is fair to predict that, while the duties are as efficiently performed as at present, lunar tables will always be founded on the same authority.

To seafaring men lunar tables are of little less importance than true time; relying on their correctness, they sail away into the broad ocean, over which the calculations made thousands of miles distant serve as finger-posts.

In order to render this branch of the observations still more efficient, an additional building is being erected, in which the moon may be observed through her entire passage. Owing to the construction of the portion of the building at present devoted to this purpose, one half of her course is very imperfectly observed, and one fourth is quite lost.

When the new part is completed, it is anticipated that the observations on our satellite may be made almost every night; at present, from the cause above alluded to, they do not exceed one hundred in the year. Some idea of the patience necessary on the part of the observer, may be inferred from the fact of his being required to watch from moonrise to an hour or more after sunrise, or from an hour before sunset to moonsetting.

Of late years, in addition to the astronomical, a series of magnetic and meteorological observations have been conducted at the observatory. For the observation of the magnetic dip, and some other points which could not be carried on near the great magnets, or other disturbing influences, a small outbuilding has been raised of wood, the greatest care being taken that no particle of iron should be used in the construction.

Such is the extreme delicacy and susceptibility of some of the instruments in this apartment, that they are suspended by skeins of fibrous silk, enclosed, in some instances, within tubes of glass.

These skeins are prepared at Manchester expressly for the purpose; the fibres consist of seven or eight threads, as when reeled off in readiness for spinning: the slightest twist would render them unfit for use; and it is essential that they should be of uniform thickness.

There are three magnetometers, the magnets for which were made at Gottinger; they are of polished steel, each two feet in length, one inch and a half in width, and one quarter of an inch in thickness. In reading off the results, allowance is made for the presence of iron in the apparatus which supports them, or in other parts of the room. These instruments, with the barometer, and the wet and dry thermometers, are observed every two hours, day and night (except on Sundays), the dew point four times every day; the magnetic dip is observed on the forenoon and afternoon of each of two days in every week; on one particular day in every month, previously determined for the observatories in various parts of the world, and known as a term day, magnetic observations are made at every five minutes; on one day in each month, hourly observations of the barometer are made; observations with the actinometer, an instrument for ascertaining the radiation of solar rays, are made when circumstances are favorable; electrical and extraordinary observations of any kind, when circumstances require them. The indications of the self-registering instruments are regularly preserved or read off; the rain gauges, &c. which are cumulative, but not self-registering, are read, some once a day, some once in a week.

In addition to these instruments, there are an atmospheric electrometer, a galvanometer, and an anemometer. The last registers of itself the force, direction and duration of winds. There are also self-registering thermometers, which are suspended from the side of the Dreadnought hospital ship, for ascertaining the temperature of the water of the Thames, with the object of assisting the registra-rgeneral in the meteorological report affixed to his weekly sanitary report.

In astronomical science, everything depends on the precision with which the longitude of a place is determined as regards any other fixed place: by the transmission of chronometers from one point to the other, this may be ascertained. An operation of this nature is now in progress to determine the difference of longitude between Greenwich and Pulkowa, in Russia. As it is necessary that the observers as well as the instruments should be interchanged, M. Struve, astronomer at the latter place, has come over to make observations from this point, for which purpose a transit instrument has been placed at his disposal.

The Nautical Almanac is generally printed three years in advance, for the benefit of those who go long voyages. The list of stars for this work has a first claim in the astronomical observations; and it is a rule that each star shall be observed at least twenty times in every three years.

Besides these, there are observations of stars for refraction; of those selected for the moon-culminating list of the almanac; of those compared with comets, and others observed in trigonometrical survey. The sun, moon, and planets are observed at every practicable opportunity, the latter through all hours of the night (except on Sundays), when the moon only, with accompanying stars, is observed. Occultations, diameters, and the eclipses and movements of Jupiter's satellites, complete a catalogue which, for scope and detail, reflects the highest credit on those concerned in its execution.

The electrical apparatus is attached to a pole 80 feet high, fixed in the garden; a wire connected with this is led into one of the rooms of the building, where pith balls, suspended near a bell, are attached to it. When the apparatus is excited by the electric state of the atmosphere, the balls become violently agitated, and, striking against the bell, cause a ringing, which immediately attracts the attention of the attendant.

In Flamsteed's time, a well was sunk in this garden 100 feet in depth, with steps leading to the bottom, for the purpose of observing the stars in the daytime; but this has long since been arched over, as the improvements in the construction of telescopes render it unnecessary

The whole mass of observations, both meteorological and astronomical, is regularly printed, a quarto volume of some thousand pages appearing once in the year. Most of these are distributed amongst the observatories all over the world, with a view to assist the cause of science, and to facilitate the great series of observations, undertaken at the expense of government, which have now been carried on for four or five years, and are expected to be brought to a conclusion in the present year.

In order to have some security that the assistants, of whom there are nine regularly on the establishment, are in attendance to take their observations at the time appointed, a clock, commonly termed 'the watchman's clock,' is fixed in the ante-room; it has no hands, but a series of knobs, to which cords are attached on the dial plate, which turns round; this is secured by a door with a lock and key, so that the only external communication is by the cords, one of which being pulled by the assistant when he leaves, a knob is displaced, the dial plate turns round, and thus a complete check is kept upon the attendance of the subordinate officers.

Among the extraordinary scientific operations to which the observatory has contributed its aid, was that of instructing the officers of the corps of Royal Engineers, who were appointed to trace the Canadian boundary; one portion of which, a straight line of a distance of 70 miles, was to connect two defined points. The country through which this line was to pass is described as surpassing in its difficulties the conception of any European. It consists of impervious forests, steep ravines, and dismal swamps. A survey of the line was impossible; a plan was therefore arranged by the astronomer royal, founded on a determination of the absolute latitude and difference of longitude of the two extremities. The difference of longitude was determined by the transfer of chronometers, by a very circuitous route, from one end to the other; after which the necessary computations were made, and marks laid off for starting with the line from both extremities.

One party, after cutting more than 42 miles through the woods, were agreeably surprised on the brow of a hill at seeing before them a gap in the woods on the next line of hill, which opened gradually, and proved to be the line of the opposite party. On continuing the lines till they were abreast of each other, their distance was found to be 341 feet, a difference which arose in an error of only a quarter of a second of time in the difference of longitude. The performance of this operation reflects the highest honor on the officers engaged. Transits were observed, and observations made, on whose delicacy everything depended, when the thermometer was lower than 19 degrees below zero, and when the native assistants, though paid highly, deserted on account of the severity of the weather.

The Wonderful Power of Fuel.—It is well known to modern engineers (remarks an English journal), that there is virtue in a bushel of coal, properly consumed, to raise 70,000,000 of pounds weight a foot high. This is actually the average effect of an engine working in Huel Towan, Cornwall, England. Let us pause a moment and consider what this is equivalent to in matters of practice. The ascent of Mont Blanc from the valley of Chamouni is considered, and with justice, as the most toilsome feat that a strong man can execute in two days. The combustion of two pounds of coal would place him on the summit.

The Use of Oil.—In this country, children are "perpetually watered," as though they were amphibious animals. In the East Indies children are rarely washed in water; but they are oiled every day. A child's head can be kept much cleaner, if oiled, than without it, and many young persons with hectic cheeks would probably never know the last days of consumption if their parents would insist on having the chest, back and limbs anointed with sweet oil two or three times a week. The Hebrew physicians seem to have considered oil as more efficacious than any other remedy.

Answer to Enigma in No. 35.

'Brigham Young.' ANNA MARIA.

Manti, Nov. 9, 1856.

Restoration.

West Jordan Ward, Nov. 9, 1856.

Br. David Park has been restored to his former standing. JOHN BENNION, Bishop.

THE 37TH QUORUM.

The Members of the 37th Quorum of Seventies are informed that their future meetings will be held in the ante-room of the Seventies' Hall, on the first Saturday of every month, at six o'clock in the evening. Every member residing in and near this city is requested to be in punctual attendance.—By order of the Council,

J. G. CHAMBERS, Clerk.

P. S. The Council are anxious to hear from all the members in the Territory and those on missions.

MARRIED:

In Provo city, on Sunday October 19, by Bishop Elias H. Blackburn, Mr. HENRY C. ROGERS and Miss EMMA HIGBEE.

In Provo city, on Sunday October 19, by Emer Harris, Mr. JOSEPH McCARRELL and Miss CHARLOTTE OSCAR.

DIED:

In Payson, Utah county, Nov. 12, ELLEN, wife of Richard J. Keel, aged 68 years.

She became a member of the Church of Jesus Christ of Latter Day Saints in 1842, and removed to the mountains in 1852. She was faithful and exemplary in all her conduct.—[Com.

In this city, on Tuesday the 11th inst., SUSANNAH, wife of Peter Fullmer, aged 73 years and 2 months; in full faith of the gospel and of a glorious resurrection.—Com.

NEW ADVERTISEMENTS.