

REPORT OF THE COUNCIL OF THE SOCIETY

TO THE

SEVENTEENTH ANNUAL GENERAL MEETING,

FEBRUARY 10, 1837.

THE Council, agreeably to the annual custom, proceed to report, at this the Seventeenth Anniversary of the Society, upon the several subjects which have engaged their attention during the past year, or which may be interesting to the Fellows at large. And it is with much pleasure that they can commence their statement by announcing the acquisition of an additional room to their apartments, which was given up to the Society, by His Royal Highness the President of the Royal Society, on the 30th of November last. This room is situate immediately over the meeting-room of the Society, and affords an opportunity of placing the property of the Society in a more convenient and accessible position. The Council, however, at the same time regret that the rooms below the ground floor, which they were in hopes would have been placed in the possession of the Society before this time, have not yet been obtained.

Since the last Anniversary, the Committee which was formed for examining and arranging the books in the library, have terminated their labours. Many of the volumes have been bound, and, by the methodical arrangement of the whole, the books are now more accessible to the Fellows. The Assistant Secretary is engaged in making a catalogue; which, when completed, will render the library more available than it has hitherto been. When it is considered that very few of the books in the library have been purchased by the Society, but that they are almost wholly presents from the

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respective authors, or from public bodies, and that many of them are rare in this country, it is evident that this portion of the property of the Society cannot be guarded with too great care, nor the rules for its circulation and protection too strictly enforced. At the same time, the Council are desirous of impressing upon the members at large the expediency of extending this portion of the means of the Society, so as to make it a focus of rare and valuable works on the science, and to prevent the necessity of an appeal to other sources for information on all points connected with physical or practical astronomy.

The Auditors, appointed by the Society, have examined and approved the accounts of the Treasurer for the past year; and the following is the abstract of the Receipts and Expenditure during that period: to which is annexed the present state of the funds and property of the Society, as nearly as the same can be estimated.

<i>Receipt.</i>				<i>Expenditure.</i>			
	£.	s.	d.		£.	s.	d.
Balance of last year's account ..	93	13	7	William Wyon for 4 silver medals			
1 year's dividend on £500 Consols	15	0	0	and cases	6	8	0
½ yr's. dividend on £1409. 15s. 9d.				J. Moyes for printing Monthly			
New 3½ per Cents	24	13	5	Notices, Nos. 16 to 23, both			
Ditto on £1431. 13s. 4d. ditto ..	25	1	1	inclusive, and for paper.....	27	13	6
For 2 silver medals and cases				Remnant and Edmonds for bind-			
allowed to S. Holehouse, Esq.				ing books for the Library	17	2	3
by the Council	3	14	0	J. Jackson for ditto	6	10	5
For 100 copies of Captain W. H.				J. B. Baillière for books	2	15	0
Smyth's paper, " Telescopic				Purchase of £21. 17s. 7d. New			
Appearance of Halley's Comet"	0	13	9	3½ per Cents (the Rev. S. W.			
On account of arrears	43	1	0	Waud's composition).....	21	0	0
82 annual contributions, 1836-7	172	4	0	J. Weale for paper, and printing			
2 compositions	42	0	0	Vol. IX. Memoirs of the Soci-			
10 admission fees	21	0	0	ety, &c.	236	5	2
9 first year's contributions	16	16	0	J. Basire for drawing Telescopic			
Sale of Memoirs	171	9	0	Appearance of Halley's Comet,			
				1835, and paper and printing	8	10	0
				J. Basire for engraving view of			
				the Armagh Mural Circle	16	5	0
Carried forward ..	£629	5	10	Carried forward ..	£342	9	4

Receipt.			Expenditure.		
	£.	s. d.		£.	s. d.
Brought forward ..	629	5 10	Brought forward ..	342	9 4
			R. Lloyd for paper and printing		
			two views, New Armagh Mural		
			Circle	3	0 0
			The Guardians of the Strand		
			Union, two poor rates	4	3 4
			1 yr's. salary to the Assist.-Sec.,		
			to Dec. 10, 1836	100	0 0
			Harrison and Ranson for station-		
			ery supplied for the Society ..	10	8 0
			For coals, wood, oil, and candles,		
			for the year	11	4 5
			Tea, sugar, cakes, and biscuits,		
			milk and cream, ditto	13	13 0
			Porterage and porter's work at		
			the rooms, cleaning windows,		
			chimneys, &c.	10	18 0
			Engraving medals, and printing,		
			&c.	2	8 10
			Collector's and bookseller's com-		
			mission on sale of Memoirs,		
			and collection of contributions,		
			&c., £334. 14s. 6d.	14	4 6
			Balance in the Treasurer's hands,		
			Jan. 30, 1837	116	16 5
	£629	5 10		£629	5 10

The Assets and present property of the Society may be estimated as follow : viz.

Balance in the hands of the Treasurer			£116	16	5
Arrears, Jan. 30, 1837.	1	contribution of 5 years' standing	£10	10	0
	1	of 4 ditto	8	8	0
	7	of 3 ditto	44	2	0
	7	of 2 ditto	29	8	0
	22	of 1 ditto	46	4	0
			138	12	0

	£.	s.	d.
2 admission fees, and first year's contributions, at four guineas each,			
new Fellows	8	8	0
6 ditto and ditto, at three guineas each, ditto.....	18	18	0
£1431. 13s. 4d. 3½ per Cent } Stock, valued at about.....	1850	0	0
£ 500. 3 per Cent }			
Unsold Memoirs.			
Various astronomical instruments, books, prints, &c.			
2 Gold Medals, unappropriated.			
2 silver ditto ditto.			

The progress and present state of the Society, with respect to the number of its Fellows and Associates, may be seen from the following abstract, continued from the Report of the last year : viz.

	Compounded.	Annual Contributors.	Non-residents.	Patron, and Honorary.	Total Fellows.	Associates.	Grand Total.
February 1836..	66	117	99	5	287	37	324
Since elected ..	1	17	..	1	19	..	19
Deceased	-1	-2	-3	..	-6	-1	-7
Resigned	..	-2	..	..	-2	..	-2
Removals }	+1	-1					
..	..	+1	-1				
Reinstated	..	+1	..	..	+1	..	+1
February 1837..	67	131	95	6	299	36	335

It is always a source of regret to the Council, in these annual statements, to have to recur to the loss which the Society has sustained by the decease of any of its distinguished members or benefactors. Amongst the deaths in the past year, the Society has to deplore, on the home list, the loss of Mr. POND, Lieut. MURPHY, Capt. HORSBURGH, Mr. RAMAGE, and Professor FARISH, together with that of M. GAMBART, one of the associates.

Mr. POND was born in London about the year 1767. His father realised in trade a fortune sufficient to enable him to retire in the prime of life, and to settle at Dulwich, where he passed the remainder of his days. When about seven years old, Mr. POND was sent to school, under the Rev. Mr. GARROW, at Hadleigh, near Barnet; and, two or three years afterwards, to Mr. CHERRY, then master of the free grammar-school at Maidstone. Mr. CHERRY was afterwards head master of Merchant Tailors' School.

At the age of fourteen, he resided at home with his family, and attended as a private pupil Mr. WALES, then mathematical teacher at Christ's Hospital, better known as the nautical astronomer who accompanied Capt. Cook in his voyages of discovery. To Mr. WALES, Mr. POND remarked an appearance of discrepancy in the Greenwich Observations, implying some imperfection in the instruments, but his suggestion was, naturally enough, neglected by the veteran mathematician, himself a friend and admirer of Dr. MASKELYNE. At a subsequent period, Mr. POND verified his early suspicion.

At sixteen, he was entered at Trinity College, Cambridge, with a particular introduction to Dr. WARING, the Lucasian professor of mathematics. Mr. JONES was his public, and the late Professor LAX his private tutor. Unfortunately, his attention was not directed to the studies of the university as steadily as it should have been. His mathematical taste and talents were of a high order, and so esteemed by his fellow students; but he had all along been extremely fond of chemistry, and this distracted his application to geometry. He had erected a furnace and laboratory at his father's house; and at Cambridge he attended with a delight, which he never forgot, the lectures of Dean MILNER, who then filled the chair of chemistry with great ability. It is more to our purpose to notice that he was one of three students who united to induce the Plumian professor, Mr. VINCE, to give a course of lectures on practical astronomy.

His health, however, gave way, and a severe pulmonary attack compelled him to seek a warmer climate. He spent two or three years in the south of France and in Spain, and then returned to college, where, during a residence of two or three years, he formed many valuable friendships, which were only dissolved by death. To this part of his life he always reverted with great

pleasure ; and, among her numerous sons, Trinity College had none more zealous and affectionate than Mr. POND. A second attack of illness obliged him to go abroad, and he resided for some time in Portugal, Constantinople, and Egypt. On his return he settled at Westbury, in Somersetshire.

He had become possessed of a very beautiful altitude and azimuth circle by TROUGHTON, and with this instrument he undertook a series of observations, which, with the conclusions deduced from them, are published in the *Philosophical Transactions* for 1806. In this important memoir he proved, beyond the possibility of doubt, *that the Greenwich quadrant had changed its form since it was erected by BIRD and used by BRADLEY.** This had been suspected before, partly on account of the difference found between the distances of the two solstices from the equator. The subject was, however, so much complicated with refraction, and the then fashionable repeating circle so oddly confirmed this apparent difference (although no physical cause could be assigned for its existence), that we may fairly consider Mr. POND's memoir to have been the first *conclusive* evidence against the quadrant, and that which led to a change in the form of the declination instrument at Greenwich and elsewhere. He was elected a fellow of the Royal Society in February 1807, and married the same year.

After the publication of this investigation, Mr. POND resided for some time in London, where he continued to occupy himself with practical astronomy ; and, on the death of Dr. MASKELYNE in 1811, was appointed astronomer-royal. The instruments which Mr. POND found at Greenwich were those erected for BRADLEY sixty years before : the quadrants, now deformed by the yielding of their frames ; the transit, which had, from some cause, ceased to describe a true circle ; and the zenith sector. The only accurate " foundations " of astronomy were MASKELYNE's right ascensions of 36 principal stars, and the zenith distances of γ *Draconis*. The mural circle, which had been previously ordered, came into Mr. POND's possession in 1812 ; but the mode of using it, and the defects, or rather the accidents, to which the new instrument was liable, were to be discovered : and it was indeed fortunate

* Mr. TROUGHTON shewed this opinion to be true, by actually measuring several radii and chords with an optical beam compass. The middle of the arc was found to be flattened and brought nearer to the centre.

that this *experiment* fell into his hands. Mr. POND saw, almost intuitively, the vast superiority of this over every preceding form of the declination instrument; and for some years he, and the artist who constructed it, were, perhaps, the only persons who did clearly see, and broadly assert, that the operation of a circle does not depend upon having a bearing on each side, or a complete axis.* The gigantic transit was erected in 1816, and it is from this epoch we may date correct catalogues in Right Ascension, and in North Polar Declination of English staple.

A mural circle by Mr. THOMAS JONES, which was intended for the Cape of Good Hope, was sent in 1825 to Greenwich, that it might previously be tried and verified. In the course of this inquiry, Mr. POND hit upon his method of combining two circles, so as to form one instrument, which he always deemed to be a most important improvement. At his earnest intreaty, he was allowed to keep the second circle, which, with its prototype, continues to adorn the Royal Observatory. The 25 feet zenith tube was only completed in 1833, and a very ingenious method of turning it to the best account, and of eliminating the errors of the measuring screw, was adopted by Mr. POND; but some defects in the mechanism, and difficulties in equalising the temperature of the room (which are now understood to be overcome), have hitherto prevented the performance of this noble instrument being altogether satisfactory.

The annual parallax of some of the brightest of the fixed stars had been investigated by Dr. BRINKLEY; and, from a considerable series of careful observation, he determined the parallax of α *Lyræ*, α *Aquilæ*, *Arcturus*, and α *Cygni*. This result was not confirmed by Mr. POND, who declared the quantity of parallax discovered by Dr. BRINKLEY to be inadmissible, and contradictory to the results of the mural circle. Mr. POND supported this opinion by observations on α *Cygni* and β *Aurigæ*, with a fixed telescope, used to measure differences. Further observations convinced Dr. BRINKLEY that the amount of parallax was sensible; and he attempted to shew that it was not

* Those who wish thoroughly to understand the mural circle, should examine Mr. POND's memoirs, and the volumes of the *Greenwich Observations*. Some account may be found both of the instrument, and of Mr. POND's mode of using it, in the *Penny Cyclopædia*, article "Circle."

inconsistent with the data of the Greenwich instrument. Both astronomers remained, as might have been expected, in their original opinions; for the whole inequality, if true, is too small to be perceived, except in masses of favourable and careful observations. It is to their credit, that neither, in this debate, forgot the respect due to his opponent or to himself, and that they differed decidedly and positively, without losing the language or temper of gentlemen and philosophers.* The opinion of the present day seems to be, that though there must be some parallax, its existence was not *proved* by Dr. BRINKLEY, and that Mr. POND was justified in denying *that any amount of parallax which is sensible in our present instruments had been detected*. The discovery of the distance of any fixed star seems to be yet a desideratum in astronomy. The Royal Society gave the Copley medal, in 1827, to Mr. POND, for his various papers and observations on subjects of astronomy. He had received the Lalande medal, in 1817, from the Académie des Sciences, of which he was a corresponding member.

For several years Mr. POND was subject to very painful and harassing complaints. He resigned his office towards the close of 1835, when a retiring pension of 600*l.* was granted him for life. He died at Blackheath, on the 7th September, 1836, and was buried at Lee, in Kent, in the same tomb with his predecessor HALLEY.

An examination of Mr. POND's observations and memoirs, during the twenty-four years he held his arduous and important office, will shew that neither his feeble health, nor repeated discouragements, cooled his zeal for the public service, or his love for practical astronomy. His friend TROUGHTON declared, that "a new instrument was at all times a better cordial for the astronomer-royal than any which the doctor could supply;" and, certainly, neither pain, nor bodily weakness, could keep Mr. POND in a prudent state of rest, when he had to bring a new instrument into work, or to make an interesting observation. As a handler of astronomical instruments, the same competent authority declared, "that Mr. POND had, within his knowledge,

* This controversy on parallax is well worth the attention of the practical astronomer. See *Philosophical Transactions*, 1810, and subsequent volumes, and the 12th volume of the *Transactions of the Irish Academy*.

no equal or rival except Captain KATER ;” and his excellence as an observer is shewn by his use of the Westbury circle, and by the early volumes of the *Greenwich Observations*, many of which he personally made. The mode of observation established by Mr. POND, *is now substantially practised in every well-conducted British observatory, and may be said to be substantially different from any which preceded it.* Besides the peculiar methods which are of his invention, he first laid down and practised the broad principle of multiplying observations, and relying upon masses,* only rejecting, and that very sparingly, such as are manifestly erroneous. It is not too much to say, that meridian sidereal observation (which excludes the Herschelian branch of astronomy) owes more to him than to all his countrymen put together, since the time of BRADLEY. In 1833, Mr. POND supplied a want which had been long felt, by the publication of a truly standard catalogue of 1113 stars.

The application of revolving or shifting microscopes to circles moving in azimuth, was suggested by Mr. POND to TROUGHTON, and executed first in the Westbury circle. He also applied the *repeating table* to the theodolite, and in both these instances procured nearly all the advantages of the circle of BORDA, without any of the imperfections of that instrument. The instruments, which were constructed by different artists under Mr. POND’s direction, are remarkable for their symmetry, strength, and elegance. Of the mural transit, recommended by him for Paramatta and for Oxford, it is yet too early to speak from actual experience ; but this form, which is a return to the *rota meridionalis* of RÖEMER, combined with the solid fixing of the microscopes, seems the most promising which has yet been given to the transit circle.

It has already been mentioned, that Mr. POND’s attention to mathematics when at Cambridge was not equal to his opportunities, nor such as might have been expected from his talents and early education. This was a subject

* When the present board of visitors was instituted, a sub-committee was appointed to suggest any alterations in the Royal Observatory which might seem advisable. The computation and reduction books were laid before them, and they were agreeably surprised to find such order and extent of calculation. Every observation was, and always had been, carefully reduced. The partial results, now published in the *Greenwich Observations*, had been omitted solely on account of the expense.

of regret to him in after life ; but it must be remembered, that, at that time, mathematico-physical research was almost unknown in this country, and that the then course of reading at Cambridge (though it might and did, in BRINKLEY and WOODHOUSE, lead to better things), was not such as to give any immediate grasp upon the physical constitution of the universe. Mr. POND had, from early youth, all the mathematics strictly necessary for a practical astronomer, and was perfectly well acquainted with *plane* astronomy, in distinction to *physical*. This was quite sufficient for the branch of astronomy to which he particularly devoted himself, viz. the determination of the places, corrections, motions, &c. of the fixed stars,—the basis on which all ulterior progress must be founded. He was perfectly free from that narrowness of comprehension which too often marks the dexterous manipulator. He always felt and expressed the highest respect for those who were to take up the subject where he laid it down, and were destined to pierce into the future by the knowledge which he could afford them of the past. It is some corroboration of this point of Mr. POND's character, that, besides his memoirs and observations, the only work he ever published is a translation of the *Système du Monde* of LA PLACE. Rare and fortunate individuals may be sometimes found who unite the requisites which form a perfect astronomer,—delicacy of organ, mechanical skill, mathematical knowledge and invention, and unwearied industry ; but if the choice of an astronomer-royal lay between a skilful practical observer (not a noter of phenomena) and a deep geometer, no one could doubt where that choice should fall. In the circle of Mr. POND's contemporaries, can one be pointed out who would have filled the office as ably as he ? Let any one look at the state of practical astronomy at the Royal Observatory and elsewhere, as he found it, and as he left it, and then answer the question.

Mr. POND, though independent in temper, was remarkably mild and gentle in his manners ; and his health and disposition, together with his attention to his office, and his dislike to every thing like contention, which almost amounted to a failing, kept him very much at home, and out of the reach of general acquaintance. His memoirs were short and compressed ; and as they *supposed* the reader to be an astronomer, and consisted chiefly of facts tabularly arranged, they were dry, and absolutely unintelligible on a careless or cursory perusal. This invited at different times a good deal of criticism ;

but it may be said, that of those who thus decided upon the manner in which the astronomer-royal performed his duty, there was hardly one whose previous publications could be cited to prove his acquaintance either with the principle of Mr. POND's methods, or even with the routine of his practice. Upon one occasion, when a formal charge was made against the accuracy of his Observations, and the fidelity with which they were printed, a very spirited vindication of the *Greenwich Observations* was offered by our illustrious associate BESSEL (*Astronomische Nachrichten*, No. 84); and, coming from such authority, this stopped all further discussion.

The scattered remarks which are to be found in the volumes of the *Greenwich Observations*, and in Mr. POND's memoirs inserted in the *Transactions* of the Royal and of the Royal Astronomical Societies, are full of valuable information, and supply many hints for consideration to the patient and intelligent practical astronomer, who will be compensated for the inconvenience of the form, and the want of arrangement, by the greater clearness and distinctness which original documents always convey. His views, as detailed in conversation, were acute, sound, and philosophical; and those who have enjoyed his society when in tolerable health, will not readily forget it.

Mr. POND's zeal led him to urge repeated increases of the establishment at Greenwich upon the government, and in the end, with great success. He commenced with one assistant, and he left it with six; and even yet, such is the severity of observation and of reduction demanded by the Greenwich instruments, and the present state of astronomy, that the Royal Observatory may be considered, in fine weather, to be not sufficiently provided with hands. In these and similar attempts, Sir JOSEPH BANKS, then President of the Royal Society, gave him effectual aid; but, after his death, it was only by repeated applications that Mr. POND could obtain the amount of force absolutely necessary to carry his system of observation into full vigour. He also effectually resisted a well-meant, but injudicious attempt, to give him for assistants persons who, from the mode of their appointment and pretensions, were little likely to submit to the rigid subordination required in a well-ordered establishment. His firmness on this occasion probably saved the Greenwich

Observatory from being a board of co-ordinate rivals, instead of the best-disciplined, most effective, and most economical institution in the country.

Mr. JOHN RAMAGE, well known as a practical optician, was a native of Aberdeen. He was originally engaged in trade, but began at an early period of life to give his attention to astronomical subjects, and particularly to the means of improving the reflecting telescope. His first essays were made on telescopes of the Gregorian form; but experience soon induced him to abandon that construction, and to adopt the principle of the front view, as had been done by Sir WILLIAM HERSCHEL. In 1817 he constructed a telescope of 20 feet focal length, with a mirror of $13\frac{1}{2}$ inches in diameter; and subsequently three others of 25 feet focal length, with mirrors of 15 inches. But his greatest achievement was one of 54 feet focal length and a 21-inch mirror, which was executed in 1823, and of which a description is given in the second volume of the *Memoirs* of this Society. Of the immense labour which he bestowed in attempting to improve the art of making metallic specula, an idea may be formed from his statement, that it was not "till after the experience obtained in casting and polishing upwards of a hundred 15-inch mirrors, besides numerous smaller ones, that he was enabled to improve the processes recommended by writers on the subject."

Mr. RAMAGE's experiments were not confined to the casting and polishing of specula, but extended also to the means of simplifying the mechanism of the stands, and of facilitating the use of reflecting telescopes, and of improving the methods of mounting equatorial instruments in general. The mechanical contrivances which he employed for these purposes evince very considerable ingenuity.

Though Mr. RAMAGE was rather an observer of phenomena than a cultivator of the science of astronomy, he possessed extensive information on most subjects relating to its practice and theory, as well as several other branches of physics. He died at Aberdeen on the 26th of December, 1835, in the fifty-second year of his age; and this account ought more properly to have been contained in the Report of the last anniversary; but the in-

formation of his decease did not reach the Council in sufficient time for such communication.

Captain JAMES HORSBURGH was born at Ely, in Fifeshire, on the 23d of September, 1762. His parents, though respectable, were poor: yet they contrived to give him all the benefit which a small school in the neighbourhood could instil; and he was afterwards apprenticed to a vessel in the coal trade. In this hard noviciate he had nearly served his stipulated time, when his ship was captured, and himself carried a prisoner to Dunkirk. After his liberation, young HORSBURGH made a voyage to the West Indies; and, on his return to London, he proceeded to Calcutta, but in a humble capacity. Here he joined the country trade as a free mariner; and, by his diligence and good conduct, became chief mate of the *Atlas*, in 1786. This vessel had the misfortune to be wrecked, in the same year, upon the isle of Diego Garcia, owing to the erroneousness of the charts then in use; and the disaster awakened the mind of HORSBURGH to the neglected state of Oriental hydrography. Thus stimulated, during the ten following years in which he served as first mate of several large ships which traded between Bombay, Bengal, and China, he neglected no opportunity of examining the various bays, coasts, and islands he touched at, to the extent of his means and ability. To qualify himself for this object, he had, by the assistance of books, previously exercised himself in the computation of lunar observations, and in the use of chronometers. He also taught himself drawing and spherics, from one of the most useful of nautical works, *Robertson's Elements of Navigation*.

The observations and corrections thus made enabled him to construct three charts of the China Sea and its channels, which being forwarded from the factory at Canton, by Mr. DRUMMOND, now Lord STRATHALLAN, they met with such approbation from Mr. DALRYMPLE, that the East India Company sent him their thanks, with a pecuniary present for the purchase of nautical instruments.

In 1796, Mr. HORSBURGH arrived in England, where he was so kindly noticed by Sir JOSEPH BANKS, Dr. MASKELYNE, Mr. CAVENDISH, and other gentlemen of eminence, that it encouraged him to renew his exertions with

vigour. Accordingly, in 1798, when he obtained the command of the *Anna*, a Bombay ship of which he had formerly been mate, he continued his observations upon a larger scale, during several voyages between Bengal, China, and England, till the year 1805, when he finally returned to this country; and, in 1810, was appointed hydrographer to the East India Company.

From the commencement of 1802 to the middle of 1804, Captain HORSBURGH kept a careful register of the indications of two marine barometers, taken every four hours, day and night, at sea and in port. His curious deductions from thence of the intertropical motions, were communicated in a paper published in the 95th Volume of the *Philosophical Transactions*; and he afterwards, to extend the utility of barometrical observations, published his *Atmospheric Register*, which affords a more simple view of the range of the mercury, than that of numerical tables.

Captain HORSBURGH returned from China in the *Cirencester*; and he had the good fortune to have the late Captain PETER HEYWOOD for his fellow-passenger. Following the advice of that experienced officer, and with his cordial assistance, HORSBURGH resolved to apply himself closely to his great work, the *East India Sailing Directory*, which, after five years' incessant labour, he produced. It is needless to add a remark on the value of this undertaking, as its utility is proved by the demand for four large editions, and by the praises of all its purchasers. Besides this noble contribution to the interests of navigation, Captain HORSBURGH published several other works upon nautical subjects, of which we may name his communication on the "Causes of the luminous appearance of the sea," and "Remarks on icebergs seen in low latitudes," both inserted in the *Philosophical Transactions*: and a new edition of Murdoch Mackenzie's *Maritime Surveying*.

Captain HORSBURGH was a man of mild unassuming manners and even temper; he enjoyed almost uninterrupted good health, which enabled him to apply to his useful pursuits till within a short time of his death, which happened on the 14th of last May, at his house at Herne Hill, in Surrey, in the 74th year of his age.

The Rev. WILLIAM FARISH, Jacksonian Professor of Natural and Experi-

mental Philosophy in the University of Cambridge, was the son of the Rev. JAMES FARISH, a minor canon of Carlisle, and was born at that place, March 22d, 1758. He entered as a sizer at Magdalen College, Cambridge, in 1774, and took the degree of Bachelor of Arts in 1778, being the senior wrangler of his year. A current story in the University (not founded, however, in fact) asserts him to have availed himself, on this occasion, of the privilege of *challenging* the students who were placed above him by the examiners, or demanding an additional examination, which terminated in his favour. The public examinations were not then conducted with their present degree of exact comparison; and Mr. FARISH himself (when afterwards moderator, which he was in 1783, 1786, and 1793) was the first who introduced the plan of making a numerical estimation of the value of each student's answer to each question.

Immediately upon obtaining his degree, not being then twenty years old, Mr. FARISH was appointed tutor of his college. In 1794, he succeeded Mr. PENNINGTON as Professor of Chemistry, and in 1813, he was removed to the Jacksonian Professorship, which he held till his death. This happened on the 12th of January last, at his living of Little Stonham, in Suffolk.

Professor FARISH will be long remembered in the University of Cambridge, as the introducer of lectures on the state of the useful arts, accompanied by the actual performance of a great many of their processes. Having taken a personal survey of all the districts in Great Britain, in which mining, manufactures, or agriculture, were especially cultivated, he provided himself with elements for the construction of models on a new and most ingenious plan. By means so simple that they excited no wonder, he presented working models of almost every machine which he described, and certainly of every fundamental form of mechanical contrivance. A few bars, axles, clamps, wheels, &c. appeared in different forms throughout the lectures, in all the diversified constructions which it was necessary to explain. Nothing could be conceived better adapted for the purposes of University instruction: the sameness of the elements employed excluded all the peculiarities of structure which depend upon particular details, and which are frequently the most striking external parts of a machine. In the lectures of Professor FARISH,

identity of principle was remembered by identity of structure, whether the contrivance were part of a watch or a watermill.

Professor FARISH was the first president of the Cambridge Philosophical Society, and his only publication is a paper in the First Volume of its Transactions, on Isometrical Perspective; a method of drawing by which he gave clearness to the representation of machinery, and in general to all pictures in which there are many parallels and perpendiculars. This he had invented to enable his assistants to set up his working models without his personal attendance. The method has since been written on in an elementary manner; and will, in all probability, be much used by future engineers.

Professor FARISH possessed simplicity and independence of character in a peculiar degree, combined with high moral worth and social qualities. In addition to the duties of his chair, he performed those of a parish priest, to the end of his life; and it was not till his seventy-ninth year that he permitted himself to think of retirement, having been then actively engaged in university duties for fifty-nine years.

Lieut. HASTINGS FITZ-EDWARD MURPHY was the son of the Rev. JOHN MURPHY, rector of Kiltallagh, county of Kerry, in Ireland; and, although he had but recently been associated with this Society, yet his ardent love for science, and his devotion in its cause, had long been previously known, and duly appreciated by many of the members. He first entered the Royal Military Academy at Woolwich, where his rising talents secured to him the notice and the friendship of the lieutenant-governor, General MUDGE: and, in the year 1815, joined the corps of engineers. After a few years' service in the usual duties, he was selected to assist in the trigonometrical survey of Ireland; and was one of the officers employed in the measurement of the base line on the shores of Loch Foyle: a service for which, from his education and habits, he was peculiarly adapted. Soon after he had joined this Society, he was placed on the Council, and was a constant attendant at its meetings when in London, and assisted them most readily on every occasion with his advice and zealous co-operation. When the Council decided, in 1834, on making a new standard scale, Lieut. MURPHY was the person unanimously

pointed out as the most proper to carry it into execution; and, day after day, for several successive weeks, he was unremitting in his exertions to accomplish this object. This sacrifice of time and attention, even in ordinary cases, can be properly appreciated by those only who have embarked in similar undertakings; but, when we consider Lieut. MURPHY's skill in manipulation, and his rigid and almost too scrupulous accuracy in recording his observations, it is impossible to estimate too highly the results which he may have obtained. Before he had completed this laborious task, he was called away to another and a very different sphere of action. An expedition was at that time fitting out, with an intention of proceeding down the Euphrates with two iron steam-boats, under the command of Colonel CHESNEY, for the purpose of opening a communication with India by means of that route. Lieut. MURPHY was desirous of accompanying him, as astronomer to the expedition; and, although at the prospect of a great pecuniary sacrifice, such was his active disposition and ardent love of science, that he resolved to brave the dangers and difficulties of the undertaking. He took out with him several astronomical and philosophical instruments; and, amongst others, the two pendulums belonging to this Society, which he intended to swing at various places on the line of route. It is needless here to recur to the sad catastrophe which befel the expedition during their descent down the river, as it is too well known to most of the members. But, although Lieut. MURPHY himself escaped all personal danger on that occasion, yet there is too much reason to fear that his exertions immediately subsequent thereto, and the shock which a constitution naturally weak, and a mind sensibly alive to so dreadful a disaster, must have received, as well as the ungenial climate of the country, shortened the period of his existence. Soon after the arrival of the expedition at Bussora, and as soon as the hurry and fatigue of Lieut. MURPHY's various duties were over, he began to complain of the oppressive heat of the place; and, on the 2d of August, was attacked with a fever which eventually carried him off in seven days. He died universally regretted and esteemed by every one that knew him, on the 9th of August, 1836; and his remains were buried, with every mark of respect and attention, in the Armenian church at Bussora. Lieut. MURPHY was a man of very mild and amiable manners, which endeared him to all his companions both at home and abroad. The astronomical and pendulum observations which he made during his voyage have not yet reached this country; but there is no doubt, when

they are received and examined, they will confirm his high character for correct judgment in making his observations, and scrupulous accuracy in recording them. And this Society cannot sufficiently deplore the loss of one who had shewn himself to be so valuable and distinguished a member.

The foreign associate whose loss we have to record, was the active astronomer, Mons. JEAN GAMBART, who, unfortunately for the interests of science, has been cut off in the very prime of life. The observatory of Marseilles had not been distinguished so much for its observations, as for the occasional papers which were issued by its directors, ST. JACQUES DE SYLVA-BELLE and M. THULIS. The principal cause of this was undoubtedly owing to the bad situation of the observatory in a crowded and confined part of the old city, and the meanness of its equipment; for even when the diligent Mons. PONS commenced his cometic discoveries there, he described the telescope which he used as being rather paralytic than parallactic. “*On ne fait plus de bonnes observations à Marseille, depuis le départ de M. PONS,*” said Baron DE ZACH, angry at what he termed the *astro-comique* announcement of the comet of January 1821, in *Pegasus*, by M. BLANPLAIN, the director who succeeded THULIS; and it was under this bad reputation that the direction was assumed by M. GAMBART. Youthful and diligent, he very soon elevated the estimation of the neglected observatory in the eyes of Europe, by his skill and exactness; though the means at his disposal were so inadequate to the object, as to be discreditable to a public establishment, especially in the town which had given birth to Pytheas.

Cramped thus in his efforts, M. GAMBART resolved to make comets his principal object, as not only the path best adapted to his instruments, but also as one which requires the exclusive labour of some of the astronomical corps. One of the first proofs of the inequality between his means and his wants, was the discovery of the comet of May 1822, in *Auriga*; but, on this occasion, his intelligence supplied resources to his execrable instruments, and he produced such creditable observations, that his computations of the orbital elements were excellent in result. The observations and reductions of various other comets, well-known to this Society, attested at once his activity and knowledge; but the periodic comet of six years and three-quarters deserves especial mention. That object was perceived by Captain BIELA, at

Johanisberg, on the 27th of February, 1826; and ten days afterwards by M. GAMBART, at Marseilles. The latter, without delay, calculated its parabolic elements from his own observations; and he recognised that it was not its first appearance, but that it had already been observed in 1805 and in 1772. It was necessary, from thence, to leave the parabolic for the elliptic elements; it was requisite to discover the duration of the comet's revolution, which the parabolic elements leave quite undetermined. This computation was separately undertaken by MESSRS. CLAUSEN and GAMBART, who found, each of them nearly at the same time, that the new comet made its entire revolution round the sun in a period of about seven years. This period was reduced to six years and three-quarters, by our associate M. DAMOISEAU, on a close study of all the sensible derangements and perturbations to which it was liable; and the interest inspired by its return in October 1832, must be fresh in the recollection of this meeting.

By the unexpected demise of M. GAMBART, this important and interesting branch of astronomy has lost one of its most zealous and talented votaries; and society a pleasing, cheerful, and truly amiable man.

During the past year another volume of the *Memoirs* of the Society has been published, being the ninth of the series; and which, the Council trust, will be considered equally valuable and important with any of the preceding ones. This rapidity of publication has encroached so much on the funds of the Society, as to render it the more necessary to attend to that system of economy, and that care in the selection of papers and mode of publication, which the Council have ever wished to pursue. The very small funds of the Society will not enable them to carry into effect all the objects which they may be desirous of prosecuting; they must consequently limit their measures to those subjects which, being within the means of their resources, may best tend to promote the ends of the Institution.

The third volume of the *Monthly Notices* of the Society is now completed, and the fourth volume commences with the present session. As only a limited number of these Notices is now printed, those members who are desirous of preserving them should understand that their loss cannot readily be supplied.

In the Report read at the last Anniversary, it was stated that a Committee had been formed for repeating the experiment of CAVENDISH on the mutual attraction of terrestrial substances. That Committee has not been inattentive to the subject; but, at present, no further progress has been made in carrying it into effect, than to ascertain that a convenient and proper site can be procured for performing the experiment.

During the past year, a new Society has been formed for promoting the study of Numismatics;—which is here noticed, because a request has been made by its Members to the Council for leave to hold their meetings, during their first session, in the meeting-room of this Society. The Council, bearing in mind the advantage and benefit derived by the Astronomical Society from a similar indulgence granted to them, in their infancy, by the Geological Society, and being also desirous of extending any assistance in their power to a rising institution, have not hesitated to comply with that request; and they trust that the present meeting will approve that decision.

The instruments belonging to the Society remain in possession of the several parties to whom they have been intrusted, as at the last Anniversary. The clock made by the celebrated JOHN HARRISON, and presented to the Society by Mr. BARTON, of the Royal Mint, as announced at the last Anniversary, has not yet been sent to the apartments of the Society. It is still in the hands of the clock-maker, for the purpose of being cleaned and adjusted; and Mr. BARTON has directed it to be forwarded to the Society as soon as that process is finished.

The Council are happy to announce, that the United States of America are about to commence a voyage of scientific discovery, on a very extensive scale. Lieutenant WILKES, an active and intelligent officer in their service, has recently visited Europe for the express purpose of procuring the best and most approved instruments of various kinds. The workshops of Paris, Munich, and London, have each furnished whatever was requisite, and no pains have been spared to place the expedition in the first state of excellence in this respect. Amongst the various instruments provided for the occasion, are two invariable pendulums, one of iron and the other of brass, of a construction somewhat similar to those belonging to this Society, but so far

different as to be rather better adapted for travelling instruments. Mr. BAILY, who superintended the formation and construction of these pendulums, has, in conjunction with Lieutenant WILKES (whose zeal and energy are an earnest of his future success), made a number of observations with them, prior to their being forwarded to America, for the purpose of similar experiments about to be made in other parts of the globe. A description of these pendulums, and the result of the observations made in London, will probably be submitted to the Society during the present session. It is the intention of Lieutenant WILKES to propose that these pendulums be swung on some of the frozen lakes of America and the land contiguous thereto, on the Alleghany mountains, and in other places in the interior of that vast continent, far distant from the sea-shore; and, under the superintendence and direction of this enterprising and discreet officer, the public may look forward to correct and important results.

Amongst the presents made to the Society in the past year, the Council wish to notice most particularly the highly finished marble bust of NEWTON, executed by Mr. SMITH, and taken from that which exists in the library of Trinity College, Cambridge. This bust has been presented to the Society by the Rev. CHARLES TURNOR, whose family now possess the estate at Wools-thorpe, the birth-place of our distinguished countryman. And in a society whose pursuits are so inseparably connected with the vast and comprehensive discoveries of this illustrious philosopher, not only will the intrinsic value of the gift be duly appreciated and approved, but also the correct judgment and feeling of the donor, in testifying, in so appropriate a manner, his esteem and regard for the Society.

It is with much pleasure, also, that the Council announce the completion of a very useful and valuable work, undertaken by one of the Fellows of this Society, at a sacrifice of time, labour, and expense, which cannot be too highly appreciated: more especially when it is considered that the sole motive for such an undertaking was a sincere and ardent desire for the promotion of Astronomy. It is well known, that the positions of many of the small stars in the Catalogue of this Society have been determined solely from one observer, either PIAZZI or LA CAILLE—there being no corresponding observations of such stars in the catalogue of BRADLEY; and, conse-

quently, that many discordances might now be discovered, without the means of ascertaining whether such discordances arose from instrumental errors or from proper motion. Mr. WROTTESLEY, therefore, has rendered an essential advantage to Astronomy by presenting to the Society a MS. catalogue of the right ascension of 1318 stars, chiefly of the smaller magnitudes, selected from the Society's Catalogue, which have been observed with that skill and attention which he is so well known to possess, and reduced with great care, by competent computers, to the year 1830. And the Council trust, that the example which has thus been so honourably furnished by Mr. WROTTESLEY will be followed by other members of the Society, in those departments of the science that still require illustration and investigation.

Amongst other advantages attending private observatories, when conducted with that ability which has just been alluded to, may be mentioned the valuable assistance which they afford to Astronomy, by making observations, out of the meridian, which do not exactly fall within the regular work of the public observations; and even in co-operating with them in observing such phenomena as casually present themselves, and where the result of numerous observations, in various situations, is required—such as comets, eclipses, occultations, &c. An interesting example of this kind was afforded last year, by the valuable communication of the foreign secretary, Captain SMYTH, of his observations of HALLEY's Comet; and which shews how materially and successfully the well-directed exertions of a private individual may improve and advance the object we have in view—the promotion of Astronomy.

The Members are aware that, for the last three years, this Society has been at the expense of printing and publishing gratuitously a planetary ephemeris, a work which has been found to be of great utility and convenience in every observatory. This expense, however, thus recurring annually, was a great encroachment on the very limited funds of the Society; and as the work was for the public benefit, it was but reasonable that it should be executed at the public cost. A representation and request was therefore made by the Council to His Majesty's Government that it might form an appendage to the *Nautical Almanac*, being well assured of the cordial co-operation of the Superintendent of that national work, who has

been ever ready to extend its utility and means of information. The wishes of the Council were most readily complied with; and the planetary ephemeris for the present and subsequent years will therefore be regularly computed and published at the public expense.

In the report of the Council at the last Anniversary, it was stated that the Superintendent of the *Nautical Almanac* had computed a third ephemeris of HALLEY'S Comet from the 1st of August, 1835, to the 31st of March, 1836; beyond which limits it was not expected that the comet would be visible to any inhabitant of this globe. Recent accounts, however, which have been received from Sir JOHN HERSCHEL and Mr. MACLEAR, shew that it was seen as late as the 5th of May last; and, in fact, each of those astronomers has transmitted continued observations of it, after its perihelion passage, up to that date, with drawings of its appearance at different times. Of the accuracy of the ephemeris for the computed period, Sir JOHN HERSCHEL speaks in the highest terms. "Tell Mr. STRATFORD," says he, "that his beautiful ephemeris seems to be quite as good as observation itself; it is quite delightful to run down the columns of it with the places deduced by observation." Mr. STRATFORD'S voluntary and arduous exertions, however, did not terminate there; for he has just completed the *final* ephemeris alluded to in the report of last year, which includes the planetary disturbances during the time that the comet was expected to have been visible in either hemisphere, but which the Superintendent proposes to extend, so as to embrace the latest observations in the southern hemisphere.

The last subject which the Council has to notice is the appropriation of the Medal, which has been awarded to Professor ROSENBERGER for his investigations relative to HALLEY'S comet. Of the labours of M. ROSENBERGER in various branches of physical and practical Astronomy, it is needless here to speak much at length, since they must be well known to all those who have attended to such subjects. Of his special claim to the medal of the Society for his investigations above mentioned, the President will state the grounds, and justify the appropriation, in his address to the meeting, which will immediately follow the reading of this report; and the Council feel assured that their decision will meet the approbation of the Members at large.