XIV. *Contributions to Terrestrial Magnetism.—No.* XII. *The Magnetic Survey of the British Islands, reduced to the Epoch* 1842·5. *By General Sir* Edward Sabine, *K.C.B., President of the Royal Society.*

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The Magnetic Survey of the British Islands originated with a few persons interested in that branch of experimental science who attended the third Meeting of the British Association for the Advancement of Science, held at Cambridge in June 1833.

On his return to Dublin from attendance at that Meeting, Dr. Humphry Lloyd, the present Provost of Trinity College, Dublin, who was then its Professor of Natural Philosophy, proposed to myself, then serving on the Staff of the Army in Ireland, to unite with him in an endeavour to realize such an undertaking, by a commencement which should be at first limited to Ireland. Fortunately I had with me at the time the instruments which I had employed for similar purposes in several arctic and equatorial voyages; and being then quartered in the South-West District of Ireland, I found it not incompatible with my military duties to undertake the Southern portion of the island, whilst Professor Lloyd occupied himself in the Northern portion. Our observations were continued at intervals throughout 1834 and until the autumn of 1835, in the summer of which year we were joined by Captain James Clark Ross, R.N., who had been associated with me in similar undertakings in Arctic countries.

A provisional report of our operations, drawn up by Professor Lloyd, was presented to the British Association assembled in Dublin in 1835, and was printed in 1836 in the 4th volume of the Reports of the Association.

Mr. Robert Were Fox, who was present at the Dublin Meeting of the Association in 1835, brought with him an apparatus for magnetic observation on a new construction of his own invention, which, when the Meeting terminated, he employed in the course of a tour in the West and North of Ireland, the results of which were incorporated in Professor Lloyd's report adverted to in the last paragragh.

In 1836, having obtained two months' leave of absence from military duties in Ireland, I employed them in extending the Survey to twenty-seven stations in Scotland, well distributed over that country, and forming the basis of a memoir on the Scottish Isoclinal and Isodynamic Lines, which was printed in the fifth volume of the Reports of the Association, published in 1837.

In the summer of 1837 Professor Lloyd commenced the magnetic survey of England by observations at fourteen stations, principally in the midland and southern districts; and in the same summer Professor John Phillips, who as one of the Secretaries of the

British Association had participated in the early interest which had originated at the Meetings of the Association, visited and observed at twenty-four stations, chiefly in the north of England. In the same summer Mr. Fox observed at twenty stations in the north of England and south of Scotland; and in the summer of 1838 at eight additional stations in the south of England. In the same years (1837 and 1838) Captain James Ross employed himself almost unremittingly in magnetic observation, visiting for the purpose fifty-eight stations, extending over England, Ireland, and Scotland generally; whilst in the same years (1837 and 1838) my own observations comprehended twenty-two stations, distributed for the most part round the coast of England and Wales, and extending into Ireland and Scotland, so as to effect a more perfect connexion of the different Lines. A general provisional account of the results which had been thus obtained was drawn up by myself at the request of my colleagues, and was printed in 1839 in the 7th volume of the Reports of the British Association.

In the year 1856, twenty years having elapsed since the proceedings which have been thus referred to, the General Committee of the British Association deemed it expedient that the Survey should be resumed, partly with a view of adding other stations to those which had been included in the earlier operations, and partly for the purpose of repeating the observations at some of the earlier stations, with the view of examining the amounts of secular change which might appear to have taken place in the interval. The five persons who had taken part in the operations of 1835–38 were requested by the General Committee to continue their services, with the addition of Mr. John Welsh, Superintendent of the Magnetic Establishment at Kew. I was not myself present at the Cheltenham Meeting of the British Association in 1856 when the resolution was passed, requesting that a repetition of the survey of 1837 should be made by the same persons by whom the earlier survey had been accomplished; but on my return to England in 1856, finding my own name standing first in the list of the Committee by whom the work was to be accomplished, I lost no time in proposing to my colleagues such arrangements as seemed suitable for the accomplishment of the object which the Association had in view. The survey of the Scottish portion of the British Islands was entrusted to the very able hands of Mr. Welsh: who, in the summer and autumn of 1857, determined the Magnetic Elements at several stations in the Interior and on the East Coast of Scotland; and in the same season of the following year, extended the Survey to the West Coast, the Hebrides, and the Orkney and Shetland Islands. This work was performed with all Mr. Welsh's wonted accuracy and completeness; and with a devotion which was but too great, for the exposure to inclement weather acting on a previous delicacy of health proved the immediate occasion of the illness which at last terminated fatally. Science lost in him not only a zealous and accomplished worker, but one of rare gifts and qualities, affording yet higher promise of usefulness, if his had been a prolonged life. A provisional account of the results of Mr. Welsh's operations, drawn up by Mr. Balfour Stewart, his successor in the superintendence of the Magnetic Observatory at Kew, was printed in the Report of the Aberdeen Meeting of the British Association in 1859.

There was reason to hope that the Irish portion of the Survey would be repeated by Professor LLOYD, with the aid of other members of the Royal Irish Academy, who proposed that, when made, it should be printed in the Transactions of that Academy.

For some time I cherished the hope that the English Survey would be accomplished, as before, by the joint labours of the original observers; and accordingly I commenced my share of the work in the summer of 1858; but as time advanced, it became evident that circumstances of health and the pressure of other employments and duties stood in the way of the hoped for combined operation. My own avocations would not permit me to devote to this object so much time consecutively as would have been required for its accomplishment in a single year; but by employing in it portions of the summers of 1858, 1859, 1860, 1861, and 1862, I obtained observations for the determination of the isodynamic and isoclinal lines at twenty-four well-distributed stations. The Declination was supplied for several points on the coasts of the United Kingdom by Captain FREDERIC JOHN EVANS, R.N., F.R.S., from observations made by several naval officers between the years 1855 and 1861. A general notice of the results thus obtained was printed in the volume of the British Association Reports for 1861, together with the details of my own observations.

Having premised this general historical statement I proceed to a more circumstantial notice of some points of detail.

Corrections employed for secular change.

A. *Declination.*—The observations of the Declination comprised in the Survey supply six stations in Scotland at which that element was determined with suitable accuracy, at an interval in each case of nineteen or twenty years. The observers in all these instances were Captain JAMES ROSS at the earlier date, *i. e.* in 1838·5, and Mr. WELSH at the later date, *i. e.* 1857·5 or 1858·5. The details are as follows:—

Stations.	Lat. N.	Long. E.	Observer.	Date.	Delination observed.	Interval.	Average annual decrease.	Mean secular change.
						years.		
Lerwick	60° 09′	358° 53′	Ross.	1838·5	27° 09′ w.	20	5′·5	5′·3
			Welsh.	1858·5	25 18 w.			
Kirkwall.....	58 59	357 02	Ross.	1838·5	27 47 w.	20	4·5	
			Welsh.	1858·5	26 17 w.			
Wick	58 25	356 55	Ross.	1838·5	27 41 w.	20	4·9	
			Welsh.	1858·5	26 04 w.			
Golspie	57 58	356 03	Ross.	1838·5	27 54 w.	20	5·0	
			Welsh.	1858·5	26 15 w.			
Inverness	57 28	355 49	Ross.	1838·5	27 39 w.	19	6·4	
			Welsh.	1857·5	25 57 w.			
Aberdeen	57 09	357 55	Ross.	1838·5	26 21 w.	19	5·5	
			Welsh.	1857·5	24 36 w.			

In the Philosophical Transactions for 1863, Art. XII., p. 291, it is shown that, at the Kew Magnetic Observatory (lat. 51° 29′ N., long. 359° 42′ E.), the average rate of diminution of the Westerly Declination in 1858–59 was 6′·8 yearly (the decrease having been a little less in the years immediately preceding 1858, and a little more in the years

immediately following that epech). We may infer, consequently, that the annual decrease of the Declination was somewhat greater in the south-east of England, than it was at the same period in Scotland: and we find it stated by Dr. LLOYD, in vol. i. page 80 of the Magnetical Observations at Trinity College in Dublin, that in the years 1840 to 1843 the rate of decrease in Dublin was about 6′·9.

In conformity with these premises, the secular change of the Declination, at the Epoch of 1842·5 to which the observations of the British Survey are referred, has been assumed to have been an annual decrease of West Declination of approximately 5′·6 in Scotland and the north of England, increasing to 6′·2 in the middle and southern part of England, and to 6′·9 in Ireland.

B. *Inclination.*—In Scotland and the adjacent islands the survey supplies seventeen stations at which observations of the Inclination were made at intervals of nineteen years and upwards. They are brought together in the following Table.

Station.	Lat. N.	Long. E.	Observer.	Date.	Inclination observed.	Interval.	Annual secular decrease.
						years.	
Lerwick	60° 09′	358° 53′	Sabine.	1818·5	74° 22′	20	1′·85 } 1′·72
			Ross.	1838·5	73 45	20	1·60 }
			Welsh.	1858·5	73 13		
Kirkwall.....	59 00	357 02	Ross.	1838·5	73 20	20	1·90
			Welsh.	1858·5	72 42		
Wick	58 24	356 55	Ross.	1838·5	73 20	20	1·95
			Welsh.	1858·5	72 41		
Golspie	57 58	356 03	Sabine.	1836·5	72 56	21	1·62
			Ross.	1838·5	73 04		
			Welsh.	1858·5	72 26		
Inverness	57 28	355 49	Sabine.	1836·5	72 46	20	1·90
			Ross.	1838·5	72 46		
			Welsh.	1857·5	72 08		
Melrose	55 35	357 16	Sabine.	1836·5	71 37	20·5	2·07
			Fox.	1837·5	71 38		
			Welsh.	1857·5	70 55		
Berwick	55 45	358 00	Ross.	1838·5	71 42	19	2·47
			Welsh.	1857·5	70 55		
Alford	57 13	357 15	Sabine.	1836·5	72 22	21	1·71
			Welsh.	1857·5	71 46		
Fort Augustus .	57 08	355 20	Sabine.	1836·5	72 40	21	1·76
			Welsh.	1857·5	72 03		
Edinburgh.....	55 57	356 49	Sabine.	1836·5	71 50	20·5	1·92
			Fox.	1837·5	71 50		
			Welsh.	1857·5	71 11		
Gretna	55 01	356 56	Fox.	1837·5	71 29	20	2·15
			Welsh.	1857·5	70 46		
Braemar.....	57 01	356 35	Sabine.	1836·5	72 14	21	2·05
			Welsh.	1857·5	71 31		
Jordanhill	55 54	355 39	Sabine.	1838·5	72 14	21	2·10
			Sabine.	1859·5	71 30		
Campbelton ...	55 23	354 22	Sabine.	1836·5	71 56	21	2·00
			Welsh.	1857·5	71 14		
Helensburgh ...	56 00	355 19	Sabine.	1836·5	72 17	21	2·24
			Welsh.	1857·5	71 30		
Cumbray	55 48	355 08	Sabine.	1836·5	72 01	21	1·52
			Welsh.	1857·5	71 29		
Glasgow.....	55 51	355 46	Sabine.	1836·5	72 02	20·5	1·83
			Fox.	1837·5	72 05		
			Welsh.	1857·5	71 26		

The mean secular change shown by this Table is an annual diminution of 1′·94, or approximately 2′·0; which has been accordingly employed in the reduction to the mean epoch (1842·5) of all the observations at the Scotch Stations.

In England the number of stations at which we have determinations of the Inclination at intervals of considerable duration (within the limits of the time comprehended by the survey) are much fewer, but they are sufficient to supply a satisfactory approximation to the amount of the secular change for the short intervals for which the corrections are required. On the eastern side of England we have five localities, at all of which the Inclination was observed at intervals comprehending from 21·5 to 24 years. These, with their respective geographical positions and the resulting annual decrease of the Inclination at each, are shown in the following Table, viz.:—

Stations.	Lat. N.	Long. E.	Observer.	Date.	Inclination observed.	Interval.	Annual secular change.
						years.	
Scarborough	54° 17′	359° 37′	Phillips.	1837·5	70° 42′	21·5	2′·23
			Ross.	1838·5	70 43		
			Sabine.	1859·5	69 59		
Cromer	52 56	1 19	Ross.	1838·5	69 46	23·0	2·22
			Sabine.	1861·5	68 55		
Lowestoft	52 28	1 50	Ross.	1838·5	69 29	23·0	2·17
			Sabine.	1861·5	68 39		
Cambridge	52 13	0 07	Lloyd.	1836·5	69 42	24·0	2·50
			Sabine.	1860·5	68 42		
Margate	51 23	1 23	Sabine.	1837·5	69 03	22·5	2·40
			Ross.	1838·5	68 57		
			Sabine.	1860·5	68 06		

On the western side of England we have four stations at which the Inclination was observed at nearly similar intervals; these are:—

Stations.	Lat. N.	Long. E.	Observer.	Date.	Inclination observed.	Interval.	Annual secular change.
						years.	
Stackpole Court...	51° 38′	355° 05′	Ross.	1837·5	69° 56′	23·0	2′·52
			Sabine.	1860·5	68 58		
Lew Trenchard...	50 40	355 50	Sabine.	1838·5	69 19	21·0	2·90
			Sabine.	1859·5	68 18		
Falmouth	50 09	354 54	Ross.	1837·5	69 16	21·5	3·07
			Sabine.	1838·5	69 12		
			Fox.	1838·5	69 14		
			Sabine.	1859·5	68 08		
Plymouth	50 22	355 51	Ross.	1837·5	69 06	22·0	2·73
			Sabine.	1859·5	68 06		

We have, further, one English station, viz. Kew, where the secular change of the Inclination has been the subject of a very careful and persistent inquiry for a much longer period (Proceedings of the Royal Society, vol. xi. pp. 144–162). In accordance with that discussion, we may safely regard an annual decrease of 2′·7 as approximately

applicable at Kew to the whole interval from 1834 to 1861. And from all these results we may infer the existence of a small but tolerably well-assured progressive augmentation in the amount of the secular change of the Inclination,—1°, with a diminishing latitude, and 2°, with an increasing westerly position.

In the corrections to the mean epoch of 1842·5 I have employed in Scotland an annual decrease of 2′·0. In England, I have increased this rate with progressively diminishing latitude, on the eastern side to 2′·65 in 51° 30′, and on the western side to 2′·85 in lat. 50° 30′. In Ireland I have taken 2′·3 in lat. 55°, increasing to 2′·8 in lat. 51°.

C. *Force.*—In the determinations of the Intensity of the Magnetic Force, the Kew Observatory has been regarded as supplying the fundamental station of the British Survey. From the Philosophical Transactions, 1863, Art. XII. p. 302, we may assume the total force at Kew in absolute measure (British units), at the definite epoch of July 1, 1860, to have been 10·302; subject to an annual increase from secular change of ·00125, as derived from the Kew Observations between April 1857 (when the regular series of absolute determinations at that observatory commenced) and March 1862. In accordance with these values the total force at Kew at the mean epoch (1842·5), for which the present maps are constructed, is taken as 10·280, and the corrections applied to the several determinations to reduce them to the mean epoch are proportional to an annual increase of ·00125.

The maps of the three magnetic elements which accompany this paper have been prepared at the Hydrographic Office, with the sanction of Admiral Richards, under the superintendence of Captain Frederick John Evans, R.N.

The Stations are arranged in the Table in order of latitude; the initials in the column of Observers denote:—L, Professor HUMPHRY LLOYD; F, Mr. ROBERT WERE FOX; R, Sir JAMES CLARK ROSS; P, Professor JOHN PHILLIPS; W, Mr. JOHN WELSH; and S, Sir EDWARD SABINE. The Naval Officers whose Declinations have been employed are Captains EVANS, OTTER, BEDFORD (B^d), BEECHEY (B^y), COX (C^x), CHURCH (C^h), WILLIAMS (W^s), THOMAS and ALDRIDGE (who are distinguished in the Table by their initials).

Stations.	Lat. N.	Long. E.	Observer.	Date.	Declination.				Inclination.				Force.			
					Observed.	Secular change.	Corrected: degrees and decimals.		Observed.	Secular change.	Corrected: degrees and decimals.		Observed.	Secular change.	Corrected.	
	° ′	° ′			° ′	° ′	° °		° ′	′	° °					
Lerwick	60 09	358 53	S.	1818·5	.....	.....	.....		74 22	−48	73·6		10·71	+·03	10·74	
			R.	1838·5	27 09	−0 22	26·8	26·8	73 45	− 8	73·6	73·7	10·65	.....	10·65	10·70
			W.	1858·5	25 18	+1 30	26·8		73 13	+32	73·8		10 74	−·02	10·72	
Kirkwall	59 00	357 02	R.	1838·5	27 47	−0 22	27·4	27·6	73 20	− 8	73·2	73·2	10·67	+·01	10·68	10·69
			W.	1858·5	26 17	+1 30	27·8		72 42	+32	73·2		10·72	−·02	10·70	
Stromness	58 57	356 44	W.	1858·5	.....	.....	.....		72 46	+32	73·3		.....	.....	.....	
Thurso	58 35	356 28	A.	1856·5	26 08	+1 18	27·4	27·7	.....	.....	.....		.....	.....	.....	
			W.	1858·5	26 30	+1 30	28·0		72 33	+32	73·1		10·67	−·02	10·65	
Loch Eribol	58 34	355 20	O.	1856·5	27 17	+1 18	28·6		.....	.....	.....		.....	.....	.....	
Durness	58 34	355 16	W.	1858·5	27 30	+1 30	29·0		72 50	+32	73·4		10·70	−·02	10·68	
Cross	58 29	353 43	W.	1858·5	28 25	+1 30	29·9		72 49	+32	73·4		10·74	−·02	10·72	
Wick	58 24	356 55	R.	1838·5	27 41	−0 22	27·3	27·4	73 20	− 8	73·2	73·2	.....	.....	.....	
			W.	1858·5	26 04	+1 30	27·6		72 41	+32	73·2		10·70	−·02	10·68	
Luxford	58 23	354 56	O.	1846·5	27 34	+0 22	27·9		.....	.....	.....		.....	.....	.....	
Carloway	58 17	353 13	O.	1856·5	28 05	+1 18	29·4		.....	.....	.....		.....	.....	.....	
Stornoway	58 15	353 37	W.	1858·5	27 56	+1 30	29·4		72 33	+32	73·1		10·69	−·02	10·67	
Gowan	58 15	354 57	O.	1846·5	27 58	+0 22	28·3		.....	.....	.....		.....	.....	.....	
Loch Inver	58 10	354 48	O.	1848·5	27 59	+0 34	28·6	28 8	.....	.....	.....		.....	.....	.....	
			W.	1858·5	27 30	+1 30	29·0		72 36	+32	73·1		.....	.....	.....	
Callinish	58 10	353 16	W.	1858·5	28 09	+1 30	29·7		72 34	+32	73·1		10·67	−·02	10·65	
Loch Shell	58 01	353 34	O.	1856·5	27 24	+1 18	28·7		.....	.....	.....		.....	.....	.....	
Golspie	57 58	356 03	S.	1836·5	.....	.....	.....		72 56	−12	72·7		.....	.....	.....	
			R.	1838·5	27 55	−0 22	27·6	27·7	73 04	− 8	72·9	72·9	10·65	+·01	10·66	10·67
			W.	1858·5	26 15	+1 30	27·8		72 26	+32	73·0		10·49	−·02	10·67	
Elgin	57 39	356 41	W.	1857·5	25 07	+1 24	26·5		72 08	+30	72·6		.....	.....	.....	
Banff	57 39	357 29	W.	1857·5	25 17	+1 24	26·7		71 57	+30	72·5		10·60	−·02	10·58	
Gordon Castle	57 37	356 51	S.	1836·5	.....	.....	.....		72 41	−12	72·5		10·65	+·01	10·66	
Loch Maddy	57 36	352 52	O.	1859·5	27 38	+1 35	29·2		.....	.....	.....		.....	.....	.....	
Dingwall	57 34	355 35	W.	1858·5	.....	.....	.....		72 25	+32	73·0		10·63	−·02	10·61	
Peterhead	57 31	358 14	W.	1857·5	25 17	+1 24	26·7		71 55	+30	72·4		10·58	−·02	10·56	
Shillay	57 31	352 18	O.	1859·5	27 15	+1 35	28·8		.....	.....	.....		.....	.....	.....	
Inverness	57 28	355 49	S.	1836·5	.....	.....	.....		72 46	−12	72·6		10·66	+·01		
			R.	1838·5	27 59	−0 22	27·6	27·5	72 46	− 8	72·6	72·6	10·67	.....	10·67	
			W.	1857·5	25 59	+1 24	27·4		72 08	+30	72·6		10·67	−·02		
Portree	57 26	353 48	W.	1858·5	.....	.....	.....		72 01	+32	72·6		10·61	−·02	10·59	
Rhynie	57 20	357 10	S.	1836·5	.....	.....	.....		72 26	−12	72·2		.....	.....		
Balmacarra	57 17	354 21	W.	1858·5	27 33	+1 30	29·1		72 13	+32	72·8		10·63	−·02	10·61	
Kyleakin	57 16	354 16	O.	1856·5	27 29	+1 18	28·8		.....	.....	.....		.....	.....	.....	
			W.	1858·5	.....	.....	.....		72 11	+32	72·7		10·64	−·02	10·62	
Broadford	57 15	354 09	W.	1858·5	.....	.....	.....		72 16	+32	72·8		10·68	−·02	10·66	
Kintore	57 15	357 37	W.	1857·5	.....	.....	.....		71 37	+30	72·1		10·55	−·02	10·53	
Loch Slapin	57 14	353 58	S.	1836·5	.....	.....	.....		73 02	−12	72·8		10·71	+·01	10·72	
Loch Scavig	57 14	353 53	S.	1836·5	.....	.....	.....		73 05	−12	72·9		.....	.....	.....	
Alford	57 13	357 15	S.	1836·5	.....	.....	.....		72 22	−12	72·2		10·57	+·01		
			W.	1857·5	24 36	+1 24	26·0		71 46	+30	72·3	72·2	10·60	−·02	10·58	
Aberdeen	57 09	357 55	R.	1838·5	26 21	−0 22	26·0	26·0	.....	.....	.....		10·55	.....		
			W.	1857·5	24 31	+1 24	25·9		71 49	+30	72·3		10·54	−·02	10·53	
Fort Augustus	57 09	355 20	S.	1836·5	.....	.....	.....		72 40	−12	72·5		.....	.....	.....	
			W.	1857·5	26 04	+1 24	27·5		72 03	+30	72·6	72·5	10·65	−·02	10·63	
Barra Sound	57 03	352 37	O.	1861·5	27 27	+1 46	29·2		.....	.....	.....		.....	.....	.....	
Braemar	57 01	356 35	S.	1836·5	.....	.....	.....		72 14	−12	72·0		10·55	+·01		
			W.	1857·5	25 09	+1 24	26·6		71 31	+30	72·0	72·0	10·59	+·02	10·56	
Dalwhinnie	56 56	355 43	W.	1857·5	25 55	+1 24	26·3		71 40	+30	72·2		10 60	−·02	10·58	
Corpach	56 51	354 52	W.	1857·5	26 22	+1 24	27·8		71 53	+30	72·4		10·70	−·02	10·68	
Pitlochry	56 42	356 17	W.	1857·5	25 23	+1 24	26·8		71 35	+30	72·1		10·54	−·02	10·52	
Tobermorie	56 39	353 58	W.	1858 5	.....	.....	.....		.....	.....	.....		10·66	−·02	10·64	
Glencoe	56 39	354 53	S.	1836·5	.....	.....	.....		72 17	−12	72·1		10·60	+·01	10·61	
Glenmorven	56 38	354 02	W.	1858·5	.....	.....	.....		72 02	+32	72·6		.....	.....	.....	
Blairgowrie	56 36	356 42	S.	1836·5	.....	.....	.....		71 55	−12	71·7		10·59	+·01	10·60	
Dunkeld	56 35	356 27	R.	1838·5	.....	.....	.....		72 23	− 8	72·2		10·55	.....	10·55	
Arternish	56 33	354 53	S.	1836·5	.....	.....	.....		72 43	−12	72·5		.....	.....	.....	
Castle Duart	56 31	354 15	S.	1836·5	.....	.....	.....		72 15	−12	72·1		.....	.....	.....	
Oban	56 26	354 33	W.	1857·5	26 12	+1 24	27·6		71 30	+30	72·0		10·56	−·02	10·54	

TABLE (continued).

Stations.	Lat. N.	Long. E.	Observer.	Date.	Declination.			Inclination.			Force.		
					Observed.	Secular change.	Corrected: degrees and decimals.	Observed.	Secular change.	Corrected: degrees and decimals.	Observed.	Secular change.	Corrected.
	° ′	° ′			° ′	° ′	°	° ′	′	°			
Newport	56 25	357 05	S.	1836·5	.....	.....	.....	72 17	−12	72·1	10·56	+·01	10·57
Fern Tower	56 22	356 10	S.	1859·5	.....	.....	.....	71 24	+34	72·0	10·63	−·02	10·61
Inverary	56 15	354 56	F.	1837·5	.....	.....	.....	72 07	−10	72·0	.....	.....	.....
Loch Lomond	56 13	355 20	F.	1837·5	.....	.....	.....	72 15	−10	72·1	.....	.....	.....
Loch Goil Head	56 10	355 06	W.	1857·5	25 52	+1 24	27·3	71 17	+30	71·8	10·53	−·02	10·51
Kirkaldy	56 07	357 00	S.	1836·5	.....	.....	.....	72 11	−12	72·0	10·56	+·01	10·57
Loch Gilphead	56 04	354 32	S.	1836·5	.....	.....	.....	72 08	−12	71·9	.....	.....	.....
Tarbert	56 02	356 11	W.	1857·5	.....	.....	.....	71 34	+30	72·1	10·55	−·02	10·53
Helensburgh	56 00	355 19	S.	1836·5	.....	.....	.....	72 01	−12	71·8 } 71·9	10·54	+·01	10·55 } 10·54
			W.	1857·5	.....	.....	.....	71 30	+30	72·0 }	10·54	−·02	10·52 }
Ardrishaig	56 00	354 33	W.	1857·5	26 30	+1 24	27·9	71 26	+30	71·9	10·58	−·02	10·56
Broxburn	56 00	357 31	T.	1856·5	24 36	+1 18	25·9	.....	.....	.....	.....	.....	.....
Linlithgow	55 59	356 23	F.	1837·5	.....	.....	.....	71 59	−10	71·8	.....	.....	.....
Edinburgh	55 58	356 49	S.	1836·5	.....	.....	.....	71 50	−12	71·6	10·51	+·01	10·52 } 10·53
			F.	1837·5	.....	.....	.....	71 50	−10	71·7 } 71·7	.....	.....	..... }
			W.	1858·5	24 56	+1 30	26·4	71 11	+31	71·7 }	10·56	−·02	10·54 }
Loch Ridan	55 57	354 50	S.	1836·5	.....	.....	.....	72 17	−12	72·1	.....	.....	.....
Fast Castle	55 55	357 36	T.	1856·5	24 29	+1 18	25·8	.....	.....	.....	.....	.....	.....
St. Abbs	55 55	357 52	T.	1856·5	24 28	+1 18	25·8	.....	.....	.....	.....	.....	.....
Jordanhill	55 54	355 39	R.	1838·5	.....	.....	.....	.....	.....	.....	10·52	+·01	10·53 } 10·54
			S.	1838·5	.....	.....	.....	.....	.....	.....	10·54	+·01	10·55 }
Glasgow	55 51	355 46	S.	1836·5	.....	.....	.....	72 02	−12	71·8 }	10·51	+·01	10·52
			F.	1837·5	.....	.....	.....	72 05	−10	71·9 } 71·9	.....	.....	.....
			W.	1857·5	25 28	+1 24	26·9	71 26	+30	71·9 }	.....	.....	.....
Port Askeg	55 52	353 52	W.	1858·5	.....	.....	.....	71 14	+32	71·8	10·66	−·02	10·64
Brisbane	55 48	355 08	W.	1857·5	25 14	+1 24	26·6	71 33	+30	72·1	.....	.....	.....
Bridgend	55 48	353 44	W.	1858·5	.....	.....	.....	71 15	+32	71·8	10·68	−·02	10·66
Cumbray	55 48	355 08	S.	1836·5	.....	.....	.....	72 01	−12	71·8 } 71·9	10·57	+·01	10·58
			W.	1857·5	25 37	+1 24	27·0	71 29	+30	72·0 }	.....	.....	.....
Berwick	55 45	358 00	R.	1838·5	.....	.....	.....	71 42	− 8	71·6 } 71·5	10·54	+·01	10·55
			W.	1857·5	.....	.....	.....	70 55	+30	71·4 }	.....	.....	.....
Carstairs	55 43	356 20	W.	1857·5	.....	.....	.....	70 56	+30	71·4	.....	.....	.....
Loch Ranza	55 42	354 43	S.	1836·5	.....	.....	.....	72 23	−12	72·2	10·54	+·01	10·55
Port Ellen	55 40	353 50	W.	1858·5	.....	.....	.....	71 04	+32	71·6	.....	.....	.....
Ardrossan	55 39	355 13	W.	1858·5	.....	.....	.....	71 14	+32	71·8	10·62	−·02	10·60
Makerstoun	55 35	357 59	*	1842·5	25 27	.....	25·5	.....	.....	.....	.....	.....	.....
			W.	1857·5	23 56	+1 24	25·3	70 50	+30	71·3	10·55	−·02	10·53
Melrose	55 35	357 16	S.	1836·5	.....	.....	.....	71 37	−12	71·4 }	10·49	+·01	10·50
			F.	1837·5	.....	.....	.....	71 38	−10	71·5 } 71·4	.....	.....	.....
			W.	1857·5	24 27	+1 24	25·9	70 55	+30	71·4 }	.....	.....	.....
Dryburgh	55 34	357 21	S.	1836·5	.....	.....	.....	71 34	−12	71·4	10·48	+·01	10·49
Lamlash	55 31	354 55	W.	1857·5	.....	.....	.....	71 06	+30	71·6	10·60	−·02	10·58
Ayr	55 28	355 22	W.	1857·5	25 26	+1 24	26·8	71 06	+30	71·6	10·55	−·02	10·53
Alnwick Castle	55 25	358 18	S.	1838·5	.....	.....	.....	71 23	− 8	71·3	10·44	+·01	10·45
Campbelton	55 23	354 22	S.	1836·5	.....	.....	.....	71 56	−12	71·7 } 71·7	10·57	+·01	10·58
			W.	1857·5	26 24	+1 24	27·8	71 14	+30	71·7 }	.....	.....	.....
Moffat	55 20	356 33	F.	1837·5	.....	.....	.....	71 40	−10	71·5	.....	.....	.....
Loch Swilly	55 17	352 33	Bd.	1855·5	27 01	+1 30	28·5	.....	.....	.....	.....	.....	.....
Carn	55 15	352 45	L.	1834·5	.....	.....	.....	72 01	−19	71·7	10·63	+·01	10·64
Jardine Hall	55 10	356 36	S.	1859·5	.....	.....	.....	70 44	+34	71·3	10·50	−·02	10·48
Belsay	55 07	358 07	F.	1837·5	.....	.....	.....	71 17	−10	71·1	.....	.....	.....
Dumfries	55 05	356 24	W.	1857·5	24 47	+1 24	26·2	70 44	+30	71·2	10·52	−·02	10·50
Cushendal	55 04	353 55	F.	1835·5	.....	.....	.....	72 00	−14	71·8	.....	.....	.....
Gretna	55 01	356 56	F.	1837·5	.....	.....	.....	71 29	−10	71·3 }	.....	.....	.....
			W.	1857·5	23 33	+1 24	25·0	70 46	+30	71·3 } 71·3	10·51	−·02	10·49
Londonderry	54 59	352 36	R.	1839·5	28 47	−0 20	28·5	72 02	− 7	71·9	10·58	.....	10·58
Culgruff	54 58	356 00	R.	1838·5	.....	.....	.....	71 36	− 8	71·5	.....	.....	.....
Newcastle	54 58	358 24	P.	1837·5	.....	.....	.....	71 18	−10	71·1 }	10·45	+·01	.....
			S.	1838·5	.....	.....	.....	71 09	− 8	71·0 } 71·1	10·43	+·01	10·45
			R.	1838·5	.....	.....	.....	71 13	− 8	71·1 }	10·44	+·01	.....
Newton Stewart	54 56	355 32	W.	1857·5	25 10	+1 24	26·6	70 54	+30	71·4	10·52	−·02	10·50
Loch Ryan	54 55	355 01	S.	1836·5	.....	.....	.....	71 43	−12	71·5	10·50	+·01	10·51
Stranraer	54 54	354 58	W.	1857·5	25 38	+1 24	27·0	70 55	+30	71·4	10·52	−·02	10·50
Stonehouse	54 54	357 16	R.	1838·5	.....	.....	.....	71 24	− 8	71·3 }	10·45	+·01	10·46 } 10·46
			S.	1838·5	.....	.....	.....	71 20	− 8	71·2 } 71·3	10·45	+·01	10·46 }
Carlisle	54 54	357 06	P.	1837·5	.....	.....	.....	71 29	−10	71·3	10·48	+·01	10·49
Strabane	54 49	352 32	L.	1834·5	.....	.....	.....	72 00	−16	71·7	10·58	+·01	10·59
Skull	54 43	358 00	F.	1837·5	.....	.....	.....	71 14	−10	71·1	.....	.....	.....
Skiddaw	54 40	356 51	F.	1837·5	.....	.....	.....	71 15	−10	71·1	.....	.....	.....
Penrith	54 40	357 15	P.	1837·5	.....	.....	.....	71 23	−10	71·2	10·46	+·01	10·47
Bangor	54 39	354 18	S.	1836·5	.....	.....	.....	71 39	−12	71·5	10·54	+·01	10·55
Keswick	54 37	356 51	F.	1837·5	.....	.....	.....	71 14	−10	71·1	.....	.....	.....
Whitehaven	54 33	356 27	S.	1838·5	.....	.....	.....	71 11	− 8	71·1	10·46	+·01	10·47

* At the Makerstoun Observatory.

TABLE (continued).

Stations.	Lat. N.	Long. E.	Observer.	Date.	Declination. Observed.	Declination. Secular change.	Declination. Corrected: degrees and decimals.	Inclination. Observed.	Inclination. Secular change.	Inclination. Corrected: degrees and decimals.	Force. Observed.	Force. Secular change.	Force. Corrected.
Patterdale	54° 32′	357° 04′	P.	1837·5	° ′	° ′	° °	71° 20′	−10′	71°·2	10·46	+·01	10·47
Darlington	54 32	358 27	P.	1837·5	.....	.....	.....	71 07	−10	71·0	.....	.....	.....
Whitby	54 29	359 23	P.	1837·5	.....	.....	.....	70 58	−10	70·8	10·41	+·01	10·42
Grassmere	54 27	356 59	F.	1837·5	.....	.....	.....	71 13	−10	71·1	.....	.....	.....
Lissadel	54 23	351 27	*	1838 5	.....	.....	.....	71 56	− 8	71·8	.....	.....	.....
Bowness	54 22	357 05	P.	1837·5	.....	.....	.....	71 18	−10	71·1	10·46	+·01	10·47
Osmotherly	54 22	358 42	P.	1837·5	.....	.....	.....	71 03	−10	70·9	10·41	+·01	10·42
Coniston	54 22	356 55	P.	1837·5	.....	.....	.....	71 20	−10	71·2	10·48	+·01	10 49
Enniskillen	54 21	352 22	L.	1834·5	.....	.....	.....	72 00	−16	71·7	.....	.....	.....
Armagh	54 21	353 21	L.	1834·5	.....	.....	.....	71 42	−16	71·4 } 71·5	10·52	+·01	10 53
			R.	1839·5	.....	.....	.....	71 41	− 6	71·6 }	.....	.....	.....
Hambleton	54 20	358 45	P.	1837·5	.....	.....	.....	71 04	−10	70·9	10·41	+·01	10·42
Scarborough	54 17	359 37	P.	1837·5	.....	.....	.....	70 42	−10	70·5 }	10·38	+·01	10·39 }
			R.	1838·5	.....	.....	.....	70 43	− 8	70·6 } 70·6	.....	.....	..... } 10·40
			S.	1859·5	.....	.....	.....	69 59	+34	70·6 }	10·42	−·02	10·40 }
Thirsk	54 14	358 39	P.	1837 5	.....	.....	.....	70 59	−12	70·8	10·43	+·01	10·44
Belmullet	54 13	350 03	L.	1835·5	.....	.....	.....	72 13	−16	72·0	10·57	+·01	10·58
Peel Town	54 13	355 17	P.	1837·5	.....	.....	.....	71 24	−11	71·2	10·48	+·01	10·49
Markree	54 12	351 34	L.	1835·5	.....	.....	.....	72 06	−16	71·8 } 71·8	10·56	+·01	10·57
			R.	1839·5	.....	.....	.....	72 02	−10	71·9 }	.....	.....	.....
Douglas	54 10	355 32	P.	1837·5	.....	.....	.....	71 22	−11	71·2 } 71·2	10·49	+·01	10·50
			R.	1837·5	.....	.....	.....	71 20	−11	71·2 }	.....	.....	.....
Studley Park	54 08	358 26	F.	1837 5	.....	.....	.....	70 56	−11	70·8	.....	.....	.....
Bridlington	54 08	359 46	R.	1838·5	24 39	−0 24	24·3 } 24·2	70 39	− 9	70·5	.....	.....	.....
				1856·5	22 44	+1 25	24·2 }	.....	.....	.....	.....	.....	.....
Flamborough	54 08	359 52	P.	1837·5	.....	.....	.....	70 37	−11	70·4	10·36	+·01	10·37
Ballina	54 07	350 53	L.	1835·5	.....	.....	.....	72 11	−18	71·9 } 71·9	10·55	+·01	10·56
			F.	1835·5	.....	.....	.....	72 07	−18	71·8 }	.....	.....	.....
Castleton	54 04	355 20	P.	1837·5	.....	.....	.....	71 23	−12	71·2	10·48	+·01	10·49
Carlingford	54 02	353 49	L.	1834·5	.....	.....	.....	71 30	−19	71·2	.....	.....	.....
York	53 58	358 54	P.	1837·5	.....	.....	.....	70 49	−11	70·6 } 70·6	10·40	+·01	10·41
			R.	1838·5	.....	.....	.....	70 45	− 9	70·6 }	.....	.....	.....
Loch Conn	53 58	350 50	F.	1835·5	.....	.....	.....	72 08	−17	71·9	.....	.....	.....
Achil Ferry	53 56	350 08	L.	1835 5	.....	.....	.....	72 07	−17	71·8	10 57	+·01	10 58
Garstang	53 54	357 13	F.	1837 5	.....	.....	.....	70 59	−12	70·8	.....	.....	.....
Stonyhurst	53 51	357 32	S.	1858·5	.....	.....	.....	70 00	+38	70·6	10·38	−·02	10·36
Westport	53 48	350 31	F.	1835·5	.....	.....	.....	72 03	−17	71·8 } 71·8	.....	.....	.....
			R.	1839·5	29 09	−0 21	28·8	71 59	− 8	71·8 }	10·61	+·01	10·62
Edgeworthstown	53 42	352 27	R.	1839·5	28 08	−0 21	27·8	71 30	− 8	71·4	.....	.....	.....
Busko Bridge	53 39	357 10	F.	1837·5	.....	.....	.....	70 45	−12	70·6	.....	.....	.....
Grimsby	53 34	359 55	R.	1856·5	22 30	+1 27	24·0	.....	.....	.....	.....	.....	.....
Cleethorpe	53 32	0 00	S.	1861·5	.....	.....	.....	69 30	+44	70·2	10·36	−·02	10·34
Doncaster	53 31	358 53	P.	1837·5	.....	.....	.....	70 30	−12	70·3	10·37	+·01	10·38
Clifden	53 29	350 01	F.	1835·5	.....	.....	.....	71 52	−18	71·6	.....	.....	.....
Wadworth	53 28	358 53	R.	1838·5	.....	.....	.....	70 28	−10	70·3	.....	.....	.....
Manchester	53 28	357 46	L.	1836·5	.....	.....	.....	70 48	−14	70·6	.....	.....	.....
Liverpool	53 25	356 59	F.	1837·5	.....	.....	.....	70 39	−12	70·5	.....	.....	.....
			†	1856·5	24 00	+1 27	25·5	.....	.....	.....	.....	.....	.....
Gallhorick	53 25	350 55	F.	1835·5	.....	.....	.....	71 41	−18	71·4	.....	.....	.....
Birkenhead	53 24	357 00	L.	1836·5	.....	.....	.....	70 49	−14	70·6 }	10·39	+·01	10·40 } 10·42
			P.	1837·5	.....	.....	.....	70 39	−12	70·5 } 70·5	10·42	+·01	10·43 }
			S.	1837·5	.....	.....	.....	70 35	−12	70·4 }	.....	.....	.....
			R.	1837·5	.....	.....	.....	70 36	−12	70·4 }	.....	.....	.....
Calderstone	53 23	357 07	P.	1837·5	.....	.....	.....	70 44	−12	70·5	10·38	+·01	10 39
Sheffield	53 22	358 29	P.	1837·5	.....	.....	.....	70 30	−11	70 3	10·40	+·01	10·41
Dublin	53 21	353 44	F.	1835·5	.....	.....	.....	70 59	−17	70·7 }	.....	.....	.....
			S.	1836·5	.....	.....	.....	71 03	−15	70 8 } 70·75	10·48	+·01	10·49 }
			R.	1838·5	27 35	−0 26	27·2 } 27·2	71 00	−10	70·8 }	10·48	+·01	10·49 } 10·49
			L.	1842·5	27 13	.....	27·2 }	70 42	.....	70·7 }	10·48	+·01	10·49 }
Lowth	53 19	0 00	R.	1838·5	24 26	−0 24	24·0	70 19	− 9	70·2	.....	.....	.....
Holyhead	53 19	355 23	F.	1835·5	.....	.....	.....	71 04	−17	70 8 } 70·9	.....	.....	.....
			L.	1836·5	.....	.....	.....	71 09	−14	70·9 }	10·42	+·01	10·43
Galway	53 17	350 56	F.	1835·5	.....	.....	.....	71 26	−18	71·1 } 71·2	.....	.....	.....
			L.	1835·5	.....	.....	.....	71 33	−18	71·3 }	10·56	+·01	10·57
Shannon Harbour	53 14	352 07	R.	1838·5	28 03	−0 28	27·6	71 23	−10	71·2	.....	.....	.....
Bangor	53 14	355 54	F.	1835·5	.....	.....	.....	71 02	−17	70·8	.....	.....	.....
Coed	53 11	356 48	P.	1837·5	.....	.....	.....	70 41	−12	70·5	10·39	+·01	10·40
Carnarvon	53 09	355 46	F.	1835·5	.....	.....	.....	70 58	−17	70·7	.....	.....	.....
Glangwnna	53 08	355 46	S.	1858·5	.....	.....	.....	70 02	+40	70·7	10·44	−·02	10·42
Matlock	53 08	358 28	L.	1836 5	.....	.....	.....	70 29	−14	70·3 } 70·2	.....	.....	.....
			F.	1837·5	.....	.....	.....	70 19	−12	70·1 }	.....	.....	.....

* Observed by Mr. ARCHIBALD SMITH.

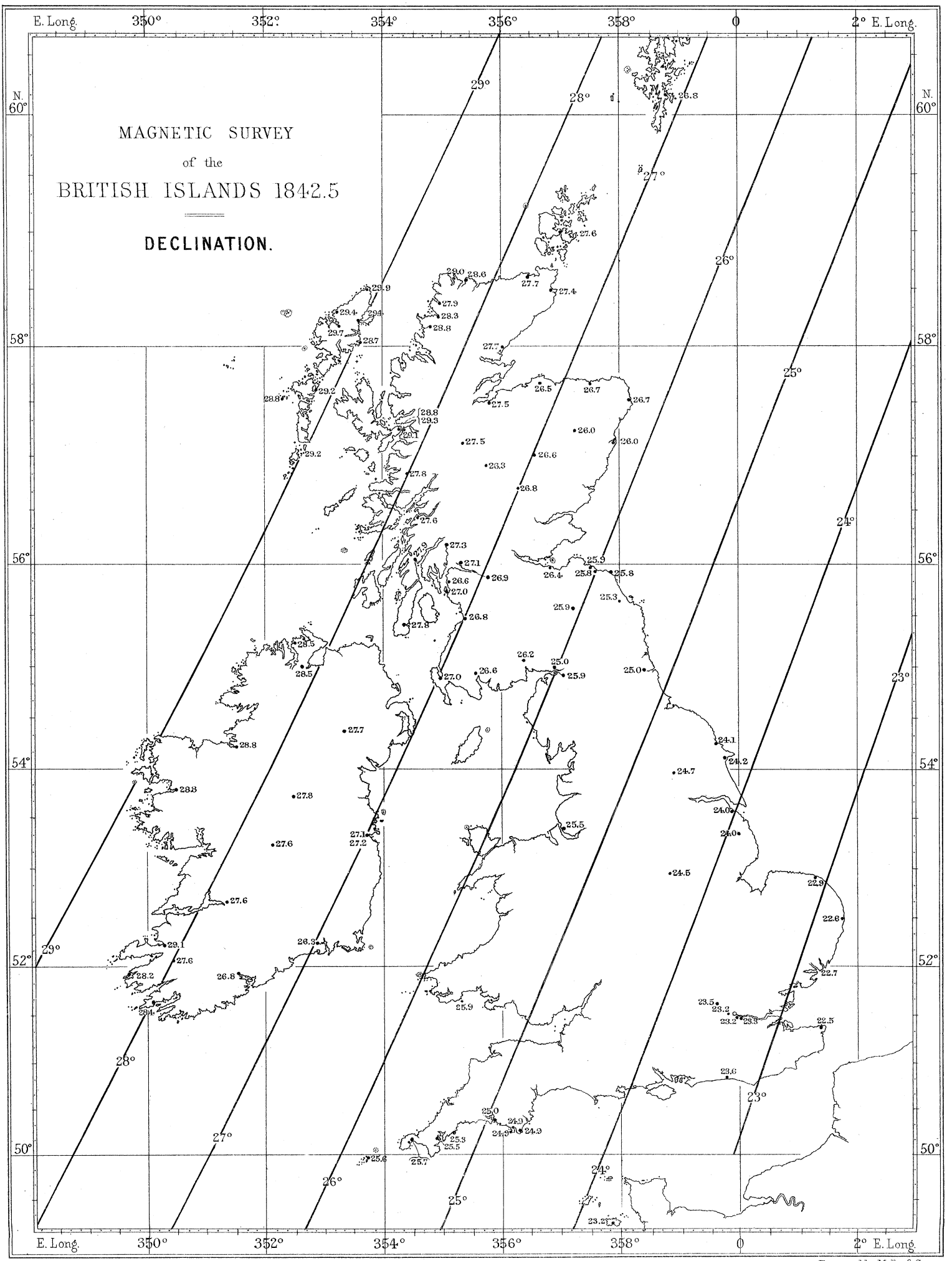
† Observed by Mr. RUNDELL of Liverpool.

TABLE (continued).

Stations.	Lat. N.	Long. E.	Observer.	Date.	Declination.			Inclination.			Force.		
					Observed.	Secular change.	Corrected: degrees and decimals.	Observed.	Secular change.	Corrected: degrees and decimals.	Observed.	Secular change.	Corrected.
	° ′	° ′			° ′	° ′	°	°	′	°			
Llanberris	53 07	355 57	F.	1835·5	.....	.....	.....	70 57	−17	70·7	.....	.....	.....
Capelcarrig	53 06	356 07	F.	1835·5	.....	.....	.....	70 48	−17	70·5	.....	.....	.....
Nottingham	52 57	358 52	R.	1838·5	24 53	−0 24	24·5	70 16	−10	70·1	.....	.....	.....
Cromer	52 56	1 19	R.	1838·5	23 21	−0 24	22·9	69 46	−10	69·6	.....	.....	.....
			S.	1861·5	.....	.....	.....	68 55	+44	69·7	10·29	−·02	10·27
Pwllheli	52 55	355 37	R.	1837·5	.....	.....	.....	70 33	−12	70·4	.....	.....	.....
Rathdrum	52 55	353 46	L.	1835·5	.....	.....	.....	70 54	−18	70·6	10·41	+·01	10·42
Kiltanon	52 52	351 17	S.	1834·5	.....	.....	.....	71 21	−21	71·0	10·56	+·01	10·57
			S.	1835·5	.....	.....	.....	71 20	−19	71·0	.....	.....	.....
Ennis	52 51	351 02	L.	1835·5	.....	.....	.....	71 13	−19	70·9	10·53	+·01	10·54
Stafford	52 48	357 54	R.	1837·5	.....	.....	.....	70 10	−12	70·0	.....	.....	.....
Cawston	52 47	1 12	S.	1860·5	.....	.....	.....	68 54	+43	69·6	10.31	−·02	10·29
			S.	1861·5	.....	.....	.....	68 52	+46	69·6	.....	.....	.....
Lynn	52 47	0 25	L.	1836·5	.....	.....	.....	69 53	−14	69·7	10·30	+·01	10·31
Shrewsbury	52 43	357 15	L.	1836·5	.....	.....	.....	70 28	−15	70·2	10·35	+·01	10·36
			S.	1837·5	.....	.....	.....	70 25	−13	70·2	10·33	+ 01	10 34
Gorey	52 40	353 43	L.	1835·5	.....	.....	.....	70 56	−18	70·6	10·40	+·01	10 41
Limerick	52 40	351 24	S.	1834·5	.....	.....	.....	71 04	−22	70·7	.....	.....	.....
			S.	1835·5	.....	.....	.....	71 06	−19	70·7	.....	.....	.....
			L.	1835·5	.....	.....	.....	71 03	−19	70·7	.....	.....	.....
			S.	1836·5	.....	.....	.....	71 01	−16	70·8	10·53	+ 01	10·54
			R.	1838·5	28 03	−0 28	27·6	71 00	−11	70·8	10·52	+·01	10·53
Ballybunian	52 30	350 19	S.	1835·5	.....	.....	.....	71 20	−20	71·0	10·61	+·01	10·62
Lowestoft	52 28	1 50	R.	1838·5	23 00	−0 25	22·6	69 29	−10	69·3	.....	.....	.....
			S.	1861·5	.....	.....	.....	68 39	+47	69·4	10·30	−·02	10·28
Birmingham	52 28	358 07	P.	1837·5	.....	.....	.....	70 07	−12	69·9	10·38	+·01	10 39
			R.	1837·5	.....	.....	.....	70 01	−12	69 8	.....	.....	.....
Aberysthwith	52 24	355 35	S.	1837·5	.....	.....	.....	70 24	−13	70·2	10·38	+·01	10·39
Daventry	52 16	358 52	R.	1837·5	.....	.....	.....	69 41	−12	69 5	.....	.....	.....
Waterford	52 15	352 52	L.	1835·5	.....	.....	.....	70 51	−19	70 5	10·44	+·01	10·45
			R.	1838 5	26 44	−0 28	26·3	70 46	−11	70 6	10·48	+·01	10·49
Blennerville	52 15	350 16	By.	1857·5	27 24	+1 44	29·1	.....	.....	.....	.....	.....	.....
Broadway	52 13	353 36	L.	1835·5	.....	.....	.....	70 36	−20	70·3	10·45	+·01	10·46
Cambridge	52 13	0 07	L.	1836·5	.....	.....	.....	69 42	−15	69·5	10·27	+·01	10 28
			S.	1860·5	.....	.....	.....	68 42	+44	69·4	10·28	−·02	10·26
Fermoy	52 07	351 44	S.	1834·5	.....	.....	.....	70 48	−22	70·4	.....	.....	.....
Dingle	52 08	349 43	S.	1836·5	.....	.....	.....	71 08	−23	70·7	10·62	+·01	10·63
Malvern	52 07	357 31	F.	1835·5	.....	.....	.....	70 11	−18	69·9	.....	.....	.....
Hereford	52 04	357 16	L.	1836·5	.....	.....	.....	70 07	−15	69·9	10·32	+·01	10·33
Killarney	52 03	350 29	S.	1834·5	.....	.....	.....	71 05	−22	70·7	.....	.....	.....
			R.	1838 5	28 11	−0 28	27·6	70 51	−11	70 7	10·53	+·01	10·54
Llandovery	52 01	356 15	S.	1860·5	.....	.....	.....	69 10	+29	69·7	10·35	−·02	10·33
Youghal	51 57	352 10	S.	1835·5	.....	.....	.....	70 39	−19	70·3	10·50	+·01	10·51
Brecon	51 57	356 39	S.	1837·5	.....	.....	.....	70 03	−13	69·8	10·34	+·01	10·35
Valencia	51 56	349 43	S.	1835·5	.....	.....	.....	71 05	−20	70·8	10·57	+·01	10·58
			R.	1838·5	28 42	−0 28	28·2	70 52	−11	70 7	10·55	+·01	10·56
Harwich	51 56	1 13	R.	1838·5	23 08	−0 25	22·7	69 15	−10	69·1	.....	.....	.....
Ross	51 55	357 25	F.	1835·5	.....	.....	.....	70 00	−14	69·8	.....	.....	.....
Cork	51 54	351 34	L.	1835·5	.....	.....	.....	70 43	−20	70·4	10·47	+·01	10·48
			R.	1838·5	27 14	−0 28	26·8	70 39	−11	70·5	10·49	+·01	10·50
Glengariffe	51 45	350 29	S.	1834·5	.....	.....	.....	71 02	−23	70·7	.....	.....	.....
Merthyr	51 43	356 39	S.	1837·5	.....	.....	.....	70 04	−13	69·9	10·36	+·01	10·37
St. Catherine's	51 40	355 17	A.	1856·5	24 30	+1 27	25·9	.....	.....	.....	.....	.....	.....
Meath	51 40	356 14	F.	1835·5	.....	.....	.....	69 57	−18	69·7	.....	.....	.....
Bearhaven	51 39	350 09	Ch.	1857·0	26 42	+1 40	28·4	.....	.....	.....	.....	.....	.....
Bushey	51 38	359 38	R.	1837·5	23 59	−0 31	23·5	69 25	−13	69·2	.....	.....	.....
Stackpole Court	51 38	355 05	R.	1837·5	.....	.....	.....	69 56	−13	69·7	.....	.....	.....
			S.	1860·5	.....	.....	.....	68 58	+49	69 8	10·40	−·02	10·38
Chepstow	51 38	357 20	F.	1835·5	.....	.....	.....	69 48	−19	69·5	.....	.....	.....
			L.	1836·5	.....	.....	.....	69 48	−16	69 5	10·31	+·01	10·32
Swansea	51 36	356 05	R.	1837·5	.....	.....	.....	69 47	−13	69·6	.....	.....	.....
London	51 32	359 50	S.	1837·5	.....	.....	.....	69 21	−13	69·1	.....	.....	.....
			F.	1838·5	.....	.....	.....	69 18	−11	69·1	.....	.....	.....
			L.	1836·5	.....	.....	.....	69 23	−15	69 1	.....	.....	10·28
			P.	1837·5	.....	.....	.....	69 19	−13	69 1	.....	.....	.....
			R.	1838·5	.....	.....	.....	69 16	−11	69·1	.....	.....	.....
Combe House	51 31	357 26	F.	1838·5	.....	.....	.....	69 32	−11	69·4	10·30	+·01	10·31
Kew	51 29	359 42	S.	1838 5	.....	.....	.....	69 17	−11	69 1	.....	.....	.....
			Oby.	1842 5	23 13	.....	23·2	.....	.....	69·1	10·28	.....	10 28
			S.	1858·5	.....	.....	.....	68 24	+43	69·1	.....	.....	.....
Woolwich	51 29	0 02	E.	1857·5	21 46	+1 33	23·3	.....	.....	.....	.....	.....	.....
Greenwich	51 28	0 00	Oby.	1842·5	23 11	.....	23·2	.....	.....	.....	.....	.....	.....
Dunraven Castle	51 28	356 23	S.	1837·5	.....	.....	.....	69 46	−14	69·5	10·35	+·01	10·36

TABLE (continued).

Stations.	Lat. N.	Long. E.	Observer.	Date.	Declination.			Inclination.			Force.		
					Observed.	Secular change.	Corrected: degrees and decimals.	Observed.	Secular change.	Corrected: degrees and decimals.	Observed.	Secular change.	Corrected.
Clifton	° ′	° ′	L.	1836·5	° ′	° ′	°	° ′	′	° °			
Tooting	51 27	357 25	R.	1837 5	.....	.....	.....	69 43	−16	69·5 } 69·4	10·30	+·01	10·31
Marlborough	51 26	359 50	F.	1838·5	.....	.....	.....	69 34	−14	69·3 }	.....	.....	.....
	51 25	3·8 17	R.	1837·5	.....	.....	.....	69 15	−11	69·1	.....	.....	.....
Worcester Park	51 23	359 43	S.	1838·5	.....	.....	.....	69 25	−14	69 2	.....	.....	.....
			S.	1837·5	.....	.....	.....	69 07	−11	68·9	10 28	+·01	10·29
Margate	51 23	1 23	R.	1838·5	22 54	−0 25	22·5	69 03	−14	68·8 }	10·24	+·01	10·25 } 10·24
			S.	1860·5	.....	.....	.....	68 57	−11	68·8 } 68·8	.....		..... }
Eastwick Park	51 17	359 41	F.	1838·5	.....	.....	.....	68 06	+49	68·9 }	10·25	−·02	10·23 }
Broome Park	51 14	359 42	S.	1859·5	.....	.....	.....	69 08	−11	69·0	10·27	+·01	10·28
Guildford	51 14	359 26	R.	1837·5	.....	.....	.....	68 01	+16	68·8	10·25	−·02	10·23
Ilfracombe	51 12	355 54	R.	1837·5	.....	.....	.....	69 05	−14	68·9	.....	.....	.....
Dover	51 08	1 19	S.	1837·5	.....	.....	.....	69 37	−14	69·4	.....	.....	.....
Folkestone	51 05	1 10	S.	1860·5	.....	.....	.....	68 52	−14	68·6	10·22	+·01	10·23
Salisbury	51 04	358 12	L.	1836·5	.....	.....	.....	67 54	+49	68·7	10·23	−·02	10·21
			R.	1837·5	.....	.....	.....	69 23	−15	69·1 } 69·0	10·28	+·01	10·29
Shoreham	50 51	359 45	E.	1857·5	22 02	+1 33	23·6	69 15	−13	69·0 }	.....	.....	.....
St. Leonards	50 51	0 33	S.	1858·5	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tortington	50 50	359 26	R.	1837·5	.....	.....	.....	67 49	+45	68·6	10·23	−·02	10·21
			S.	1837·5	.....	.....	.....	68 56	−14	68·7 } 68·7	.....	.....	.....
Brighton	50 50	359 52	L.	1836·5	.....	.....	.....	68 57	−14	68·7 }	10 26	+·01	10·27
Southsea	50 48	359 02	R.	1837·5	.....	.....	.....	68 50	−17	68·6	10·23	+·01	10·24
Eastbourne	50 47	0 16	F	1838·5	.....	.....	.....	69 00	−14	68·8	.....	.....	.....
St. Clairs	50 44	358 52	P.	1837·5	.....	.....	.....	68 45	−11	68·6	10·21	+·01	10·22
Ryde	50 44	358 50	L.	1836·5	.....	.....	.....	69 01	−14	68·8	10·28	+·01	10·29
Exeter	50 43	356 29	R.	1837·5	.....	.....	.....	69 01	−17	68·7	10·24	+·01	10·25
								69 06	−14	68·9	.....	.....	.....
Lew Trenchard	50 40	355 30	S.	1838·5	.....	.....	.....	69 19	−11	69·1 } 69·1	10.32	+·01	10·33 } 10·32
			S.	1859·5	.....	.....	.....	68 18	+48	69 1 }	10·33	−·02	10·31 }
Weymouth	50 37	357 33	R.	1837·5	.....	.....	.....	69 07	−14	68·9	.....	.....	.....
Padstow	50 33	355 04	R.	1837·5	.....	.....	.....	69 25	−14	69·2	.....	.....	.....
Teignmouth	50 33	356 30	S.	1859·5	.....	.....	.....	68 05	+48	68 9	10·28	−·02	10·26
Torquay	50 28	356 28	S.	1859·5	.....	.....	.....	68 04	+48	68·9	10·24	−·02	10·22
			R.	1837·5	.....	.....	.....	69 06	−14	68 9 }	.....	.....	.....
Plymouth	50 22	355 51	S.	1859·5	.....	.....	.....	68 06	+48	68·9 } 68·9	10·27	−·02	10·25
			C[x].	1857·5	23 28	+1 33	25·0	.....	.....	.....	.....	.....	.....
Bigbury	50 17	356 07	C[x].	1857·5	23 20	+1 36	24·9	.....	.....	.....	.....	.....	.....
Bolt Tail	50 14	356 08	C[x].	1857·5	23 19	+1 36	24·9	.....	.....	.....	.....	.....	.....
Deadman	50 13	355 12	W[s].	1857·0	23 46	+1 34	25·3	.....	.....	.....	.....	.....	.....
Salcombe	50 13	356 13	C[x].	1857·5	23 19	+1 36	24 9	.....	.....	.....	.....	.....	.....
			R.	1837·5	.....	.....	.....	69 16	−17	69·0	.....	.....	.....
			S.	1838·5	.....	.....	.....	69 12	−12	69·0	10·29	+·01	10·30 } 10·30
Falmouth	50 10	354 54	F.	1838·5	.....	.....	.....	69 14	−12	69·0 } 69·0	10·29	+·01	10·30 }
			S.	1859·0	.....	.....	.....	69 08	+52	69·0 }	.....	.....	.....
			W[s].	1856·0	24 06	+1 25	25·5	.....	.....	.....	.....	.....	.....
Mounts Bay	50 10	354 29	W[s].	1861·0	23 41	+1 58	25·7	.....	.....	.....	.....	.....	.....
Lands End	50 05	354 20	R.	1837·5	.....	.....	.....	69 19	−17	69·0	.....	.....	.....
St. Marys	49 55	353 43	F.	1838·5	.....	.....	.....	69 26	−14	69·2	.....	.....	.....
St. Heliers	49 12	357 55	E.	1857·5	21 35	+1 34	23·2	.....	.....	.....	.....	.....	.....



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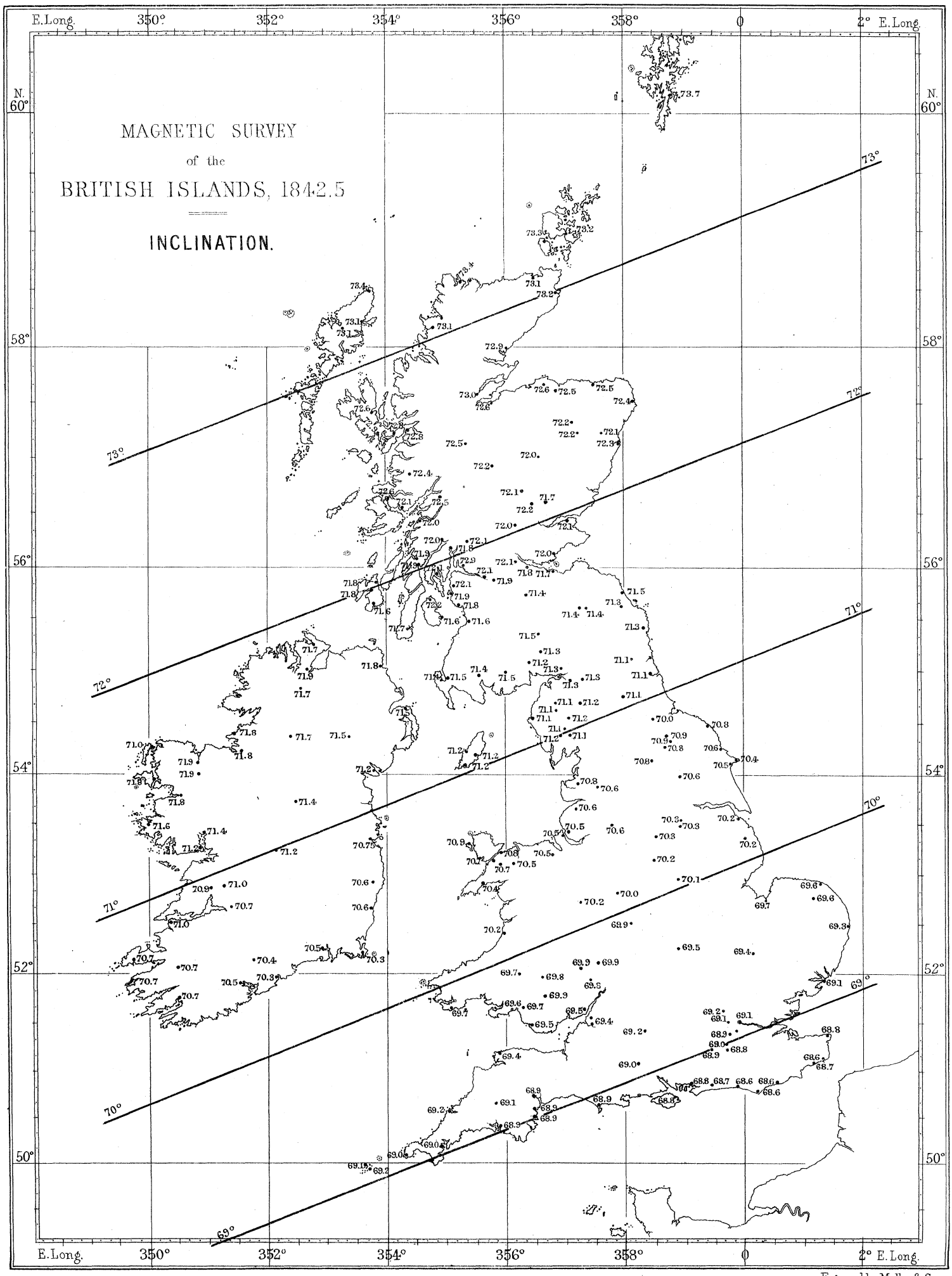

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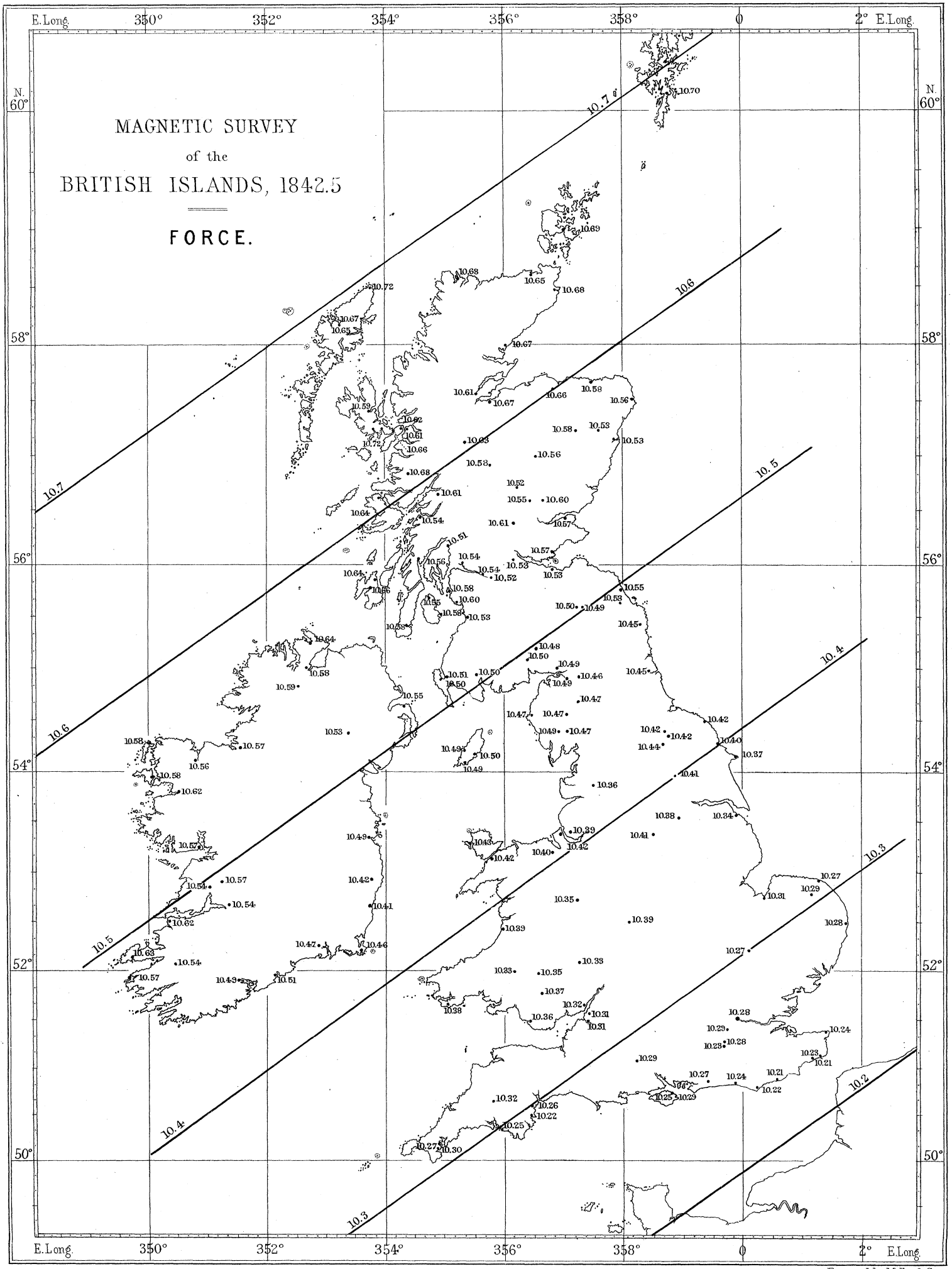

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