II. *Contributions to Terrestrial Magnetism.—No. III.*

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IN the present number of these Contributions, I propose to give an account of the observations on the magnetic intensity made at sea by the officers of Her Majesty's ships Erebus and Terror, on their passage from England to Kerguelen Island, the unreduced observations, transmitted to the Admiralty by the Commanders, Captains Ross and CROZIER, having been placed in my hands for that purpose.

They will be divided for convenience into two sections, viz.

§ 5. *Observations between England and the Cape of Good Hope.* § 6. *Observations between the Cape of Good Hope and Kerguelen Island.*

§ 5. *Observations between England and the Cape of Good Hope.*

The observations in the Erebus were made by the statical method devised by Mr. Fox, with one of his instruments of $7\frac{1}{2}$ inches diameter. The intensities were measured by the angles of deflection produced, in different localities, by a constant weight applied to a grooved wheel on the axle of the needle; and the ratio of the intensities is inversely as the sines of the angles of deflection, subject to a correction for differences of temperature of the needle, computed by the formula $\cdot 00016\ I' (t'-t)$, in which t is the standard and t' the observed temperature in degrees of FAHRENHEIT, ·00016 a coefficient determined experimentally by Mr. Fox, and I' the observed intensity. At sea, where the manipulation of the weights causes an exposure of the needle, which, in bad weather particularly, is liable to occasion injury, the plan recommended by Mr. Fox, of using deflecting magnets instead of weights, was frequently resorted to. In this case the ratio of the intensity in different localities is inversely as the sines of the angles of deflection, and directly as the weights equivalent to the deflecting force of the deflector on the needle at the respective angles; or

$$I' = I \cdot \frac{w'}{w} \cdot \frac{\sin v}{\sin v'},$$

where I, v, and w are the intensity, angle of deflection, and equivalent weight at a base station; and I', v', and w' corresponding values at another station. A table is usually formed for each instrument experimentally, under Mr. Fox's own direction, of the equivalent, or as they are termed by him, the *coercing* weights, for each deflector on each of the needles at the different angles which are likely to occur in the course of the observations. This is done by placing the deflector successively at angles from the dip*, each differing one degree from the preceding; the needle is thereby deflected to a smaller angle on the side of the dip opposite to the deflector, and is brought back to the dip by a weight applied to the grooved wheel on the axle; this weight is called the coercing weight corresponding to the angle from the dip at which the deflector was placed. For greater accuracy, the table is formed from results obtained by placing the deflector successively on either side of the needle. Owing to accidental circumstances, no table of this description was prepared for this instrument before the Expedition sailed; the pressure of other duties prevented its being done at St. Helena, the Cape of Good Hope, or at Kerguelen Island; and at Van Diemen Island the end of the axle of the needle being accidentally broken, the needle was returned to England to be repaired, and was thus separated from the instrument and from the deflectors. Under these circumstances we have no other resource for reducing the observations made with the deflectors, than to form a table from the observations of the weights and deflectors (when both methods have been employed at the same station), which shall answer the same purpose as a table of coercing weights. Fortunately the number of such stations is considerable.

We may form this table in the following manner. For the primary or base station, let V be the angle of deflection with a constant weight W, and v the angle of deflection produced by the deflector placed at the dip, then is

$$w = \mathrm{W} \sin v \operatorname{cosec} \mathrm{V},$$

w being the weight equivalent to the deflecting force of the deflector at the angle v. If several constant weights were used at the primary station, the value of w may be obtained from each separately, and an arithmetical mean taken. Then at another station, at which the angles of deflection have been observed both with the deflector and with constant weights, the equivalent weight w' to the angle v' produced by the deflector may be obtained from

$$w' = \frac{\mathrm{I}' w \sin v'}{\mathrm{I} \sin v},$$

I being the intensity at the primary station, and I′ the intensity derived by the method of constant weights at the other station. The values of w', thus computed for all the stations where the weights and deflectors were both used, being projected in a graphical representation with the corresponding values of v', the former as ordinates, the latter as abscissæ, a line drawn by the eye through the terminations of the ordinates will give the values of w' for each degree of v' produced by the deflector.

In the intensity instrument of the Erebus two deflectors were used, sometimes separately and sometimes combined: they were designated N. and S, according to the pole of the needle to which they were respectively applied. They were contained in brass tubes, N. with its north pole, and S. with its south pole towards the end of the tube which screwed into the limb of the instrument; consequently "Deflector N." in

* This analysis may be made when the needle is in other positions, but Mr. Fox now prefers the *vertical* one, or when the needle stands at 90°, the circle being perpendicular to the plane of the magnetic meridian.

the Table signifies that the deflector having its north pole towards the screw was placed opposite that division of the circle which the north end of the needle had previously indicated as the dip; and the angle of deflection v' is a mean of the deflections of the needle, first on the one side and then on the other side of the deflector.

In the case of this deflector we have the angle v observed in London 22° 57′; and the value of w, derived from the angles with the four constant weights of 1, 2, 3, and 4 grains, = 2·114 grs. Regarding London as the primary station, and the intensity = 1, the values of w' at the several stations where both weights and deflectors were used are found by

$$w' = 5{\cdot}422\ \mathrm{I}' \sin v'.$$

The table of observations furnishes seventy-four occasions between England and the Cape of Good Hope, in which this deflector was used in comparison with the constant weights: we have consequently so many values of w' from which to form a table for each degree of deflection. The angles v' produced by this deflector increased from 22° 57′ in London to above 34° where the intensity was weakest, and again decreased to 29° 53′ at the Cape; consequently the ordinates corresponding to the smaller angles are derived partly from the earlier and partly from the later observations of the series. The line drawn freely through the points forming the terminations of the ordinates shows by its continuity that the force of the deflector remained unchanged during the whole of the series; it exhibits no discordances with any of the values of w', but such as may well be attributed to the unavoidable discrepancies of single observations. By means of this graphical representation the subjoined Table has been formed of the values of w' for each degree of v', permitting the intensities I′ to be computed, relative to the force unity in London, by the formula

$$\mathrm{I}' = {\cdot}1845\ w' \operatorname{cosec} v'.$$

Values of w', Deflector N.

° grs.	° grs.
23 = 2·113	30 = 1·929
24 = 2·085	31 = 1·904
25 = 2·058	32 = 1·880
26 = 2·031	33 = 1·857
27 = 2·005	34 = 1·834
28 = 1·979	35 = 1·810
29 = 1·954	

In the case of deflector S, the table of observations furnishes 109 occasions between London and the Cape of Good Hope in which the angle v' was observed in comparison with the angles produced by the constant weights; consequently we have 109 values of w' to be combined in a graphical representation. The line freely drawn through the terminations of the ordinates is continuous from August 1839 to the noon-observation of February 12, 1840, when the continuity becomes interrupted, and a second line, corresponding to a diminished force in the deflector, commences, and continues unbroken to the Cape of Good Hope. The loss of force in the deflector, which occurred between the forenoon and afternoon observations of the 12th of February, was equivalent to nearly a degree in the angle v', and is obvious on a simple inspection of the table of observations. In this case, therefore, we require to form two tables of the values of w'; the one, Table A, corresponding to the force of the deflector between August 1839 and February 12th, 1840, and the other, Table B, to the weaker force between February 12th and the Cape of Good Hope.

Values of w', Deflector S.		
(A.) August 1839 to February 12, 1840.		(B.) February 12 to March 25, 1840.
° grs.	° grs.	° grs.
30 = 2·754	37 = 2·410	35 = 2·291
31 = 2·704	38 = 2·359	36 = 2·260
32 = 2·655	39 = 2·310	37 = 2·235
33 = 2·606	40 = 2·260	38 = 2·210
34 = 2·556	41 = 2·210	39 = 2·186
35 = 2·508	42 = 2·160	40 = 2·161
36 = 2·459	43 = 2·110	41 = 2·135
		42 = 2·110

For the first series we have London as the primary station, where I = 1, $v = 30° 19'$, and $w = 2·737$; whence

$$I' = ·1845\ w' \operatorname{cosec} v'.$$

the values of w' being taken from Table A. And for the second series we have the Cape as the primary station, where $v = 35° 40'$, $w = 2·270$, and I, derived from the experiments with the constant weights = 0·715 (London = 1); consequently at other stations

$$I' = ·1837\ w' \operatorname{cosec} v'.$$

the values of w' being taken from Table B.

The loss of force sustained by deflector S. causes a similar interruption in the continuity of the line connecting the terminations of the ordinates derived from the observations in which the deflectors N. and S. were used conjointly; we have therefore in this case also two tables of the values of w', one for the first, and the other for the second series.

Values of w', Deflectors N. and S.		
(A.) August 1839 to February 12, 1840.		(B.) February 12 to March 25, 1840.
° grs.	° grs.	° grs.
44 = 3·784	53 = 3·118	51 = 3·037
45 = 3·674	54 = 3·056	52 = 2·989
46 = 3·584	55 = 2·995	53 = 2·943
47 = 3·505	56 = 2·936	54 = 2·896
48 = 3·430	57 = 2·880	55 = 2·853
49 = 3·366	58 = 2·828	56 = 2·813
50 = 3·304	59 = 2·780	57 = 2·775
51 = 3·242	60 = 2·738	58 = 2·740
52 = 3·180		

For the first series we have London as the primary station, where $I = 1$, $v = 44° 06'$, and $w = 3{\cdot}773$; whence at other stations

$$I' = {\cdot}1845\, w' \operatorname{cosec} v',$$

w' being taken from Table A ; and for the second series the Cape as the primary station, where $I = 0{\cdot}715$, $v = 51° 10'$, and $w = 3{\cdot}032$; whence at other stations

$$I' = {\cdot}1837\, w' \operatorname{cosec} v',$$

w' being taken from Table B.

Table I. contains the observations made with the weights and deflectors on shore and on board the Erebus, between London and the Cape of Good Hope. Of 647 observations comprised in this Table, I have only found it necessary to consider a single one as doubtful, namely, the second observation with the constant weight of one grain at the Cape of Good Hope; its result differs so much from that of the observation on the preceding day with the same weight, and with those of the preceding and of the same day with the weight of $1\frac{1}{2}$ grain, that I have thought it safer to omit it in taking the mean of the results at that station; but the observation itself, and its result, are both given in the Table.

Table I.

Observations of the Magnetic Intensity on Shore, and on Board Her Majesty's Ship Erebus, with Needle F, by Captain James Clark Ross.

London to the Cape of Good Hope.

1839.	Position. Lat.	Position. Long. E.	Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity. London = 1·000		Intensity. = 1·372
			h m		° ′	°				
Aug. 28.	Westbourn Green near London.		5 P.M.	Deflector S.	30 19	70	Observed on shore.	1·000		1·372
				Deflector N.	22 57					
				Deflectors S. & N.	44 6					
				weight 1 grain.	10 34					
				weight 2 grains.	21 47					
				weight 3 grains.	33 24					
				weight 4 grains.	47 52					
Oct. 1.	50 42	0 35	1 P.M.	S.	30 38	60		·985	·990	1·358
			11 A.M.	weight 2 grains.	21 54		W. by N.	·993		
			Noon.	weight 4 grains.	48 17			·992		
3.	50 17	357 26	10 30 A.M.	weight 2 grains.	21 41	60	W. by N.	1·003	1·001	1·373
				weight 4 grains.	47 45			1·000		
8.	47 47	350 42	10 A.M.	S.	30 43	56	S.W. by W.	·981	1·007	1·382
				weight 2 grains.	21 1			1·033		
13.	41 6	348 10	9 A.M.	S.	30 43	61	S.W. by W.	·982	·966	1·326
				S. and N.	45 1			·959		
				weight 2 grains.	22 43			·959		
14.	39 30	347 51	9 30 A.M.	S.	30 22	65	S.W. by W.	·993	·977	1·346
			10 15 A.M.	S. and N.	44 35			·978		
			11 0 A.M.	weight 2 grains.	22 45			·959		
21.	Funchal Roads.		10 0 A.M.	S.	31 14	73	W. by S.	·958	·949	1·302
				S. and N.	45 17			·948		
			11 0 A.M.	weight 2 grains.	23 7	73		·946		
				weight 4 grains.	51 45			·945		
23.	Consul's House, Funchal.		7 A.M.	S.	31 18	70	Observed on shore.	·955	·946	1·297
			10 A.M.	S. and N.	45 17	71		·948		
			Noon.	weight 2 grains.	23 12	70		·942		
	32 38	343 04	0 30 P.M.	weight 3 grains.	35 45			·942		
24.?			10 30 A.M.	weight 4 grains.	51 55			·943		
26.	Funchal Roads.		2 0 P.M.	S.	31 10	70	W. by S.	·961	·941	1·291
			3 10 P.M.	weight 1 grain.	11 23	74		·930		
			3 50 P.M.	weight 2 grains.	23 20			·937		
			4 30 P.M.	weight 3 grains.	36 5			·935		
Nov. 1.	30 47	343 10	10 A.M.	S.	31 26	70	S.S.W.	·948	·931	1·277
			to	weight 1 grain.	11 29			·921		
			Noon.	weight 2 grains.	23 39			·925		
4.	Off Santa Cruz, Teneriffe.		10 A.M.	S.	31 53	76	S.S.W.	·929	·916	1·256
			to	weight 1 grain.	11 40			·908		
			Noon.	weight 2 grains.	24 5			·910		
6.	26 1	342 25	10 A.M.	S.	32 34	74	S.W. ½ W.	·900	·905	1·241
			10 20 A.M.	S. and N.	46 42			·894		
			11 15 A.M.	weight 2 grains.	24 37			·892		
			11 50 A.M.	weight 3 grains.	38 48			·879		
			1 30 P.M.	S.	31 34	74	N.W. ½ N.	·943		
			2 0 P.M.	S. and N.	45 58			·920		
7.	24 51	341 18	10 30 A.M.	S.	32 58	77	S.W. ½ W.	·884	·886	1·216
				S. and N.	46 52			·889		
8.	23 40	340 45	0 30 P.M.	S.	33 3	76	S.W. ½ W.	·880	·883	1·212
			4 0 P.M.	S.	33 8	74	S.W. ½ W.	·877		
			1 30 P.M.	S.	32 45	72	E.	·892		
			2 15 P.M.	S.	32 51	73	W.	·888		
			3 0 P.M.	S.	33 4	73	S.	·879		
			3 30 P.M.	weight 1 grain.	11 54		S.W. ½ W.	·890		
			4 0 P.M.	weight 2 grains.	25 12		S.W. ½ W.	·872		

Table I. (Continued.)

1839.	Position.		Time of day.	Method employed.	Deflection observed.	Thermo-meter.	Ship's head.	Intensity.		
	Lat.	Long. E.						London = 1·000		= 1·372.
Nov. 9.	22° 18′	340° 03′	9 h A.M.	S.	33° 13′	74°		·874		
			to	N.	25 31			·874		
			11 A.M.	S. and N.	47 24			·871	·874	1·199
			2 P.M.	N.	25 29			·878		
			3 P.M.	weight 1 grain.	11 58	73		·885		
				weight 2 grains.	25 30			·862		
10.	20 54	339 18	1 P.M.	S.	33 32	74		·861		
				weight 1 grain.	12 4			·880	·867	1·190
				weight 2 grains.	25 38			·859		
11.	19 8	338 07	9 A.M.	S.	33 56	76	S.W. ½ W.	·846		
				N.	25 54			·859	·854	1·171
				S. and N.	47 49			·858		
12.	17 10	336 55	10 30 A.M.	S.	34 8	78		·839		
				N.	26 0			·855		
				S. and N.	48 4			·850		
			Noon. to	weight 1 grain.	12 14	78		·866	·849	1·164
			1 P.M.	weight 2 grains.	26 6			·845		
				weight 3 grains.	41 0			·840		
14.	Quail Island.		10 A.M.	S.	34 4	91		·841		
			to Noon.	N.	25 59			·855		
	14 54	336 30		S. and N.	48 15		Observed	·844		
			1 30 P.M.	weight 1 grain.	12 36	93	on shore.	·844	·844	1·157
				weight 2 grains.	26 0			·850		
				weight 3 grains.	41 41			·831		
18.	Porto Praya.		6 to	S.	33 57	74	N.E.	·845		
			7 30 A.M.	S.	34 34	76	E.	·822		
			8 to	S.	33 53	78	N.	·847		
			9 30 A.M.	S.	34 30	79	W.	·825	·840	1·153
			10 to	S.	34 19	80	S.	·833		
			11 30 A.M.	S.	33 13	80	N.W.	·872		
			0 45 P.M.	S.	34 21	80	S.E.	·830		
			3 0 P.M.	S.	33 57	84	S.W.	·845		
21.	12 39	335 35	9 30 to	S.	34 4	79	S.W.	·841		
			11 A.M.	N.	26 8			·849		
				S. and N.	48 51			·827	·831	1·140
				weight 1 grain.	13 2			·815		
				weight 2 grains.	26 50			·824		
22.	11 19	335 07	Noon to	S.	34 46	81	S.W.	·815		
			1 30 P.M.	N.	27 6			·811	·813	1·115
				S. and N.	49 24			·812		
23.	9 48	334 41	11 30 A.M.	S.	35 1	84	S.W.	·806		
			to	N.	27 20			·802		
			1 P.M.	S. and N.	49 50			·800	·793	1·088
			3 to	weight 1 grain.	13 45	83		·773		
			4 P.M.	weight 2 grains.	28 24			·786		
25.	6 52	333 55	10 A.M.	S.	35 59	83	S.S.W.	·772		
				N.	28 38			·756		
				S. and N.	51 6			·767	·763	1·046
				weight 1 grain.	14 3			·757		
				weight 2 grains.	29 14			·761		
26.	5 13	333 35	10 A.M.	S.	36 13	83	S.S.W.	·764		
				N.	29 1			·743	·752	1·032
				S. and N.	51 51			·748		
29.	3 20	332 48	10 A.M.	S.	37 8	82	S.W. by S.	·734		
				N.	29 23			·731	·732	1·004
				S. and N.	52 29			·732		

Table I. (Continued.)

1839.	Position.		Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity.		
	Lat.	Long. E.						London = 1·000.		= 1·372.
	° ′	° ′	h m		° ′	°				
Nov. 30.	2 6	331 25	10 A.M.	S.	37 17	81	S.S.W. ½ W.	·729		
				N.	30 3			·711		
				S. and N.	52 34			·730	·728	·998
				weight 1 grain.	14 30	83		·734		
				weight 2 grains.	30 24			·735		
Dec. 2.	St. Paul's Rocks.		8 A.M.	S.	37 8	90		·734		
	0 56	330 40	to	N.	29 34		Observed	·725		
			9 30 A.M.	S. and N.	52 44		on shore.	·726	·727	·997
			3 P.M.	weight 1 grain.	14 39			·727		
				weight 2 grains.	30 50			·726		
3.	0 24	330 19	10 A.M.	S.	37 41	84	S.S.W. ½ W.	·717		
			to	N.	30 11			·706	·712	·977
			11 30 A.M.	S. and N.	53 15			·714		
4.	− 0 28	330 02	11 A.M.	S.	37 46	82	S. by W. ½ W.	·716		
			to	N.	30 29			·697	·700	·960
			Noon.	S. and N.	53 49			·694		
5.	− 1 37	329 17	10 30 A.M.	S.	38 10	83	S.S.W.	·702		
			to	N.	30 29			·697		
			Noon.	S. and N.	54 2			·696	·699	·959
				weight 1 grain.	15 27			·690		
			1 P.M.	weight 2 grains.	32 6			·710		
6.	− 3 18	328 31	10 A.M.	S.	38 47		S.S.W.	·683		
			10 40 A.M.	S. and N.	54 48			·679	·683	·937
			11 30 A.M.	N.	30 51			·686		
7.	− 4 49	327 43	9 30 A.M.	S.	39 7	81	S.S.W.	·674		
				S. and N.	55 1			·674		
				N.	31 24			·671		
				weight 1 grain.	16 16	82		·656	·672	·921
				weight 2 grains.	32 26			·693		
				weight 3 grains.	56 7			·664		
8.	− 6 24	327 24	11 30 A.M.	S.	39 35	82	S.	·659	·654	·897
			Noon.	weight 1 grain.	16 25			·650		
9.	− 7 50	327 28	9 30 A.M.	S.	39 50	80	S.	·652		
			10 10 A.M.	S. and N.	55 50			·657		
			10 45 A.M.	N.	32 47			·635	·648	·888
			11 30 A.M.	weight 1 grain.	16 37	80		·642		
			Noon.	weight 2 grains.	34 42			·653		
10.	− 9 21	327 58		S.	40 13	81	S.S.E.	·642		
				S. and N.	57 2			·633		
				N.	33 7			·626	·635	·870
				weight 1 grain.	16 41	83		·640		
				weight 2 grains.	35 53			·635		
11.	−11 3	328 22		S.	41 0	81	S.S.E.	·622		
				S. and N.	57 18			·628		
				N.	33 29			·617	·624	·856
				weight 1 grain.	17 7	81		·624		
				weight 2 grains	36 8			·631		
12	−12 32	328 57	10 A.M.	S.	41 24	82	S.E. by S.	·611		
			10 55 A.M.	S. and N.	57 23			·626		
			11 45 A.M.	N.	33 40			·613	·611	·840
			1 P.M.	weight 1 grain.	17 56	82	S.S.E. ½ E.	·597		
			2 P.M.	weight 2 grains.	36 56			·619		
13.	−14 00	329 28	0 30 P.M.	weight 1 grain.	18 0	82	S.S.E.	·594		
			1 P.M.	weight 2 grains.	37 57			·605		
			1 15 P.M.	S.	41 51	82		·599	·599	·822
			2 0 P.M.	S.	41 42			·603		
			6 P.M.	weight 1 grain.	18 1	79		·594		

Table I. (Continued.)

1839.	Position. Lat.	Position. Long. E.	Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity. London = 1·000.		= 1·372.
Dec. 14.	−15° 4′	330° 06′	10 A.M.	S.	41° 58′	80°	S.S.E.	·596		
				S. and N.	58 17			·610		
				N.	34 13			·600	·599	·822
				weight 1 grain.	18 7	81		·591		
				weight 2 grains.	38 27			·598		
15.	16 52	330 27	9 30 A.M.	S.	42 3	79	S. by E.	·594		
			10 20 A.M.	S. and N.	58 40			·602		
			10 50 A.M.	N.	34 21			·597	·596	·818
			11 10 A.M.	weight 1 grain.	18 10	79		·589		
			Noon.	weight 2 grains.	38 30			·597		
16.	−19 1	330 45	10 A.M	S.	42 12	78	S. ½ E.	·591		
			to	N.	34 23	78		·596		
			Noon.	S. and N.	59 1	78		·598		
			0 15 P.M.	weight 1 grain.	18 7	78		·591	·593	·814
			to	weight 1 grain.	18 14	78		·587		
			2 30 P.M.	weight 2 grains.	38 47	78		·593		
				weight 2 grains.	38 48	78		·593		
17.	Island of Trini-		10 A.M.	S.	42 5	80		·593		
	dad.			N.	34 34	80	Observed	·592		
	−20 31	330 38	to	S. and N.	59 1	80	on shore.	·598	·592	·813
				weight 1 grain.	18 14	80		·587		
			Noon.	weight 2 grains.	38 42	80		·595		
18.	−21 31	330 47	10 A.M.	S.	42 3	78	S.	·594		
			to	N.	34 5			·603		
			Noon.	S. and N.	59 4			·597		
				weight 1 grain.	18 6	79		·591	·596	·818
				weight 1 grain.	18 9			·590		
				weight 2 grains.	38 28			·598		
				weight 2 grains.	38 27			·598		
	−21 47	330 50	5 30 P.M.	S.	42 8	76	S.	·592		
			to	N.	34 13			·600	·597	·819
			7 P.M.	S. and N.	58 55			·598		
19.	−23 8	330 49	9 A.M.	S.	41 52	79	S. ½ W.	·599		
				weight 1 grain.	17 56			·597		
				weight 2 grains.	37 37			·609	·600	·823
	−23 20	331 0	6 P.M.	S.	41 58	76	S.E.	·596		
20.	−24 16	331 45	9 30 A.M	S.	41 16	77	S.E. by S.	·615		
				N.	34 8	77		·602		
			to	S. and N.	59 5	77		·597	·604	·829
			Noon.	weight 1 grain.	17 52	78		·599		
				weight 2 grains.	37 34	78		·610		
	−24 28	331 57	6 P.M.	S.	41 48	76		·601		
				N.	34 4		S.S.E.	·603	·603	·828
				S. and N.	58 33			·606		
21.	−25 38	332 41	10 A.M.	S.	41 56	76		·599		
			to	N.	34 16	76		·599		
			Noon.	S. and N.	58 46	76	S.E. by E. ½ E.	·603		
			0 40 P.M.	weight 1 grain.	17 50	78		·600		
			1 30 P.M.	weight 2 grains.	37 16	78		·614	·603	·828
	−25 42	332 51	5 P.M.	S.	41 50	77		·600		
				N.	33 53		S.E.	·608		
				S. and N.	58 53			·602		
22.	−26 52	333 30	11 A.M.	S.	41 10	77	S.S.E.	·617		
			to	N.	33 43			·611		
			2 P.M.	S. and N.	58 9			·613		
				weight 1 grain.	17 44	78		·603	·612	·839
				weight 1 grain.	17 44		S.S.E.	·603		
				weight 2 grains.	36 56			·618		
				weight 2 grains.	36 56		S.S.E.	·618		

Table I. (Continued.)

1839.	Position.		Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity.		
	Lat.	Long. E.						London = 1·000.		= 1·372.
	° ′	° ′	h m		° ′	°				
Dec. 22.	−26 49	333 30	2 to	S.	41 30	77		·608		
			3 P.M.	N.	33 23			·620		
				S. and N.	58 16		N. by E.	·611	·613	·840
				weight 1 grain.	17 42	77		·604		
				weight 2 grains.	36 48			·620		
23.	−26 12	333 20	9 A.M.	N.	33 17	78	N. ½ W.	·622		
			10 A.M.	N.	33 57	78		·606		
			11 A.M.	S.	41 46	78		·602		
	−26 12	333 23	Noon.	S. and N.	58 55	78	S.E.	·599	·607	·833
			0 30 P.M.	weight 1 grain.	17 45	77		·602		
			1 P.M.	weight 2 grains.	37 18			·613		
24.	−27 4	334 10	10 A.M.	S.	41 35	76	E.	·605		
			1 P.M.	S.	41 31	77		·608		
			to	N.	34 0	77		·605		
	−27 4	334 16	3 30 P.M.	S. and N.	58 37			·605	·609	·836
				weight 1 grain.	17 40	76	S.E. by E.	·605		
				weight 2 grains.	36 56			·618		
				weight 2 grains.	36 41			·622		
25.	−27 46	335 04	10 30 A.M.	S.	41 13	76		·615		
			to	N.	33 23	76	S. by E.	·620		
			11 30 A.M.	S. and N.	58 1	76		·615		
			Noon	S.	41 22	76		·611		
			to	N.	33 47			·610	·617	·845
			2 P.M.	S. and N.	58 11		N.N.E. ½ E.	·612		
	−27 41	335 08	2 30 to	weight 1 grain.	17 22	76		·615		
			3 30 P.M.	weight 2 grains.	35 47			·635		
26.	−26 53	335 26	9 to	S.	41 23	76	N.N.E.	·611		
				N.	33 47			·610		
			11 20 A.M.	S. and N.	57 46		N.	·619	·613	·840
			11 30 to	weight 1 grain.	17 40	78		·605		
			0 30 P.M.	weight 2 grains.	37 0		S.S.E.	·618		
27.	−26 6	335 19	10 A.M.	S.	41 41	77		·603		
			to	N.	33 55	77	N. by E.	·607		
			Noon.	S. and N.	58 8	77		·613	·607	·833
	−25 57	335 20	3 30 P.M.	weight 2 grains.	37 46	76	N.E. by N.	·607		
			4 10 P.M.	weight 1 grain.	17 51	76		·599		
28.	−25 21	335 28	10 A.M.	S.	41 55	78		·599		
			to	N.	34 3	78	S.E. by E.	·604		
			Noon.	S. and N.	58 32	78		·607		
			0 45 P.M.	weight 1 grain.	17 51	79	S.E.	·599	·602	·826
			1 30 P.M.	weight 2 grains.	38 12	79		·601		
			6 30 P.M.	weight 1 grain.	17 53	76	S.E. by S.	·598		
			7 P.M.	weight 2 grains.	38 2	76		·603		
29.	−26 12	336 12	11 A.M.	S.	41 37	79		·604		
			to	N.	34 0	79		·605		
			1 P.M.	S. and N.	58 44	79		·603		
			to	weight 2 grains.	37 46	79	S.E. by E.	·601	·604	·829
				weight 2 grains.	37 45	79		·601		
			3 P.M.	weight 1 grain.	17 46	79		·607		
				weight 1 grain.	17 49	79		·606		
30.	−27 4	337 22	10 A.M.	S.	41 24	79		·611		
			to	N.	33 56	79		·606		
			Noon.	S. and N.	58 50			·602		
	−27 5	337 28	0 15	weight 1 grain.	17 55	77	S.E.	·597	·606	·832
			to	weight 1 grain.	17 50			·600		
				weight 2 grains.	37 16	77		·614		
			1 40 P.M.	weight 2 grains.	37 18			·613		

Table I. (Continued.)

1839.	Position. Lat.	Position. Long. E.	Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity. London = 1·000.		= 1·372.
	° ′	° ′	h m		° ′	°				
Dec. 31.	−27 43	338 34	10 A.M.	S.	41 27	78	S.E. by E. ½ E.	·610		
			to	N.	34 12	78		·600		
			Noon.	S. and N.	58 50	78		·602	·607	·833
	−27 44	338 40	2 P.M.	weight 2 grains.	36 47	76	E.S.E.	·620		
			3 P.M.	weight 1 grain.	17 48	76		·601		
1840. Jan. 1.			10 30 A.M.	S.	41 39	77	E. by S.	·604		
			11 A.M.	N.	34 5			·603		
			11 30 A.M.	S. and N.	58 56			·599	·603	·828
	−28 19	340 10	Noon.	weight 1 grain.	17 52			·598		
			0 30 P.M.	weight 2 grains.	37 20			·612		
2.	−28 5	341 39	9 30 P.M.	S.	41 49	76	E.N.E.	·600		
			10 00 P.M.	N.	33 59			·605		
			10 30 P.M.	S. and N.	59 0			·598	·603	·828
			11 0 P.M.	weight 1 grain.	17 56	76		·596		
	−27 57	341 50	Noon.	weight 1½ grain.	27 7			·605		
			1 P.M.	weight 2 grains.	37 36			·609		
3.	−27 26	342 29	9 30 A.M.	S.	41 31		N.E. by E.	·607		
			10 0 A.M.	N.	33 58			·606	·605	·830
			10 40 A.M.	S. and N.	58 45			·603		
4.	−26 51	342 56	9 30 A.M.	S.	41 32		N.E. by N.	·607		
			10 0 A.M.	N.	34 5			·603		
			10 30 A.M.	S. and N.	58 59			·598	·601	·824
			11 30 A.M.	weight 1 grain.	18 2			·593		
	−26 42	343 0	Noon.	weight 2 grains.	38 7			·602		
5.			11 A.M.	S.	41 37		N.N.E.	·605		
			11 30 A.M.	N.	34 23		N. by E. ½ E.	·596		
	−25 39	342 57	Noon.	S. and N.	59 1			·598		
			1 P.M.	weight 1 grain.	18 7	76	N.N.E.	·590	·600	·823
			2 P.M.	weight 1½ grain.	26 40			·615		
	−25 29	342 58	3 P.M.	weight 2 grains.	38 20			·599		
6.			11 30 A.M.	S.	41 52	76	N.N.E.	·599		
	−24 13	343 3	Noon.	N.	34 23			·596		
			0 30 P.M.	S. and N.	59 13			·595	·592	·812
			1 0 P.M.	weight 1 grain.	18 9	76	N.E. by N.	·589		
	−24 6	343 06	3 0 P.M.	weight 1 grain.	18 14			·587		
			5 30 P.M.	weight 1 grain.	18 12			·588		
7.			10½ A.M.	S.	42 2	74		·595		
			11 15 A.M.	N.	34 34	74		·592		
	−22 49	343 35	Noon.	S. and N.	59 23			·593		
			2 30 P.M.	weight 1 grain.	18 7	74	N.E.	·590		
			5 30 P.M.	weight 1 grain.	18 20	74	N.E. ½ E.	·584	·591	·811
	−22 39	343 43	6 0 P.M.	S.	42 3	73		·595		
			6 30 P.M.	N.	34 30			·593		
	−22 34	343 49	7 0 P.M.	S. and N.	59 33			·590		
8.			10½ A.M.	S.	42 10	76	N.E. by E.	·592		
			11 15 A.M.	N.	34 34			·592		
	−21 34	344 15	Noon.	S. and N.	59 39			·589	·590	·810
			2 30 P.M.	weight 1 grain.	18 6	75		·591		
	−21 27	344 19	3 0 P.M.	weight 1 grain.	18 26			·580		
9.	−20 31	345 05	10½ A.M.	S.	42 13		E.N.E.	·591		
			11 15 A.M.	N.	34 36		N.E. by E.	·591		
	−20 24	345 10	Noon.	S. and N.	59 48			·586	·590	·810
			3 P.M.	weight 1 grain.	18 9	74	N.E. ½ E.	·589		
	−20 6	345 22	5 30 P.M.	weight 1 grain.	18 7		N.E. by E. ½ E.	·590		
10.			10 30 A.M.	S.	42 0	76	N.E. ½ E.	·596		
			11 15 A.M.	N.	34 7			·602		
	−18 57	345 45	Noon.	S. and N.	59 9			·595	·595	·817
			0 30 P.M.	weight 1 grain.	18 3	75	N.N.E. ½ E.	·592		
	−18 49	345 48	3 P.M.	weight 1 grain.	18 6	75	N.E.	·591		

TABLE I. (Continued.)

1840.	Position. Lat.	Position. Long. E.	Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity. London = 1·000.		Intensity. = 1·372.
	° ′	° ′	h m		° ′	°				
Jan. 11.	−17 39	346 10	10 30 A.M.	S.	41 54	78	N.E. by E.	·598		
			11 35 A.M.	N.	34 0		N.N.E.	·605		
	−17 33	346 13	Noon.	S. and N.	59 10		N.E. by E.	·595	·597	·820
			3 P.M.	weight 1 grain.	18 0	72	E.N.E.	·594		
	−17 19	346 21	6 P.M.	weight 1 grain.	17 57	70	S.	·595		
12.			11 30 A.M.	S.	41 54	76	N.E. by E.	·598		
	−17 11	346 40	Noon.	N.	34 43			·588		
			0 30 P.M.	S. and N.	59 7			·596	·595	·817
			2 P.M.	weight 1 grain.	17 55		S.	·597		
13.			11 0 A.M.	S.	42 9		E. by N.	·592		
			11 30 A.M.	N.	34 20		N.E.	·597		
	−16 35	347 13	Noon.	S. and N.	59 18		E. by N.	·593		
			2 P.M.	weight 1 grain.	17 58	74	N.E.	·595	·594	·816
			2 30 P.M.	weight 1 grain.	17 59			·595		
	−16 25	347 22	3 30 P.M.	weight 1½ grain.	27 43			·592		
14.			10 30 A.M.	S.	42 6	76	N.E. by E. ½ E.	·594		
			11 15 A.M.	N.	34 22			·596		
	−15 19	348 0	Noon.	S. and N.	59 9			·596	·598	·821
			2 30 P.M.	weight 1 grain.	17 55			·597		
	−15 12	348 02	3 00 P.M.	weight 1½ grain.	27 6			·606		
15.			11 30	S.	42 18			·589		
	−15 20	348 07	Noon.	N.	34 30			·593	·592	·813
			0 30 P.M.	S. and N.	59 21			·594		
16.			10 30 A.M.	S.	41 53		S.S.W.	·598		
			11 15 A.M.	N.	34 20			·597		
	−15 49	348 09	Noon.	S. and N.	58 53			·600		
			1 P.M.	weight 1 grain.	17 56	76		·596	·599	
				weight 1 grain.	17 50			·599		
				weight 2 grains.	38 16			·600		
				S.	42 26		E. by N. ¼ N.	·585	·594	·815
				N.	34 49			·587		
				S. and N.	59 22			·593		
				weight 1 grain.	18 14	76		·587	·590	
				weight 1 grain.	18 7			·590		
				weight 2 grains.	38 31			·597		
17.			3 P.M.	S.	42 19		E.	·588		
	−15 30	348 51	3 30 P.M.	N.	35 4			·582		
			4 0 P.M.	S. and N.	59 38			·589	·589	·810
				weight 1 grain.	18 0			·594		
18.	−14 37	349 30	9 30 A.M.	S.	42 12		N.E. by E.	·591		
			11 A.M.	S.	41 53		S. by W.	·598		
			11 20 A.M.	S.	42 0		S.W. by W.	·596		
			11 40 A.M.	S.	41 51		N. by E.	·599		
	−14 36	349 31	Noon.	S.	41 57		N.E. by E.	·596		
			0 30 P.M.	N.	34 30			·593	·595	·816
			1 0 P.M.	S. and N.	59 31			·591		
	−14 31	349 39	2 0 P.M.	weight 1 grain.	17 55	76		·597		
			2 30 P.M.	weight 1 grain.	17 56			·596		
			3 P.M.	weight 2 grains.	38 25			·598		
	−14 27	349 50	4 P.M.	weight 2 grains.	38 28			·597		
19.	−13 39	350 29	Noon.	S.	42 1		E. by N.	·596		
			3 P.M.	S.	41 52		S. by W. ½ W.	·598	·599	·822
	−13 35	350 36	2 P.M.	weight 1 grain.	17 41	76	S.S.W.	·604		
20.			10 30 A.M.	S.	42 28		E. ¼ N.	·584		
			11 15 A.M.	N.	34 19			·597		
	−14 19	350 33	Noon.	S. and N.	59 29			·591	·592	·813
				weight 1 grain.	17 55			·597		

Table I. (Continued.)

1840.	Position. Lat.	Position. Long. E.	Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity. London = 1·000.		Intensity. = 1·372.
	° ′	° ′	h. m.		° ′	°				
Jan. 21.	−14 51	350 31		S.	42 16		W.	·589		
				S.	42 7		N.W.	·593		
				S.	41 44		N.	·601		
				S.	42 6		N.E.	·593	·594	·815
				S.	42 15		E.	·589		
				weight 1 grain.	17 52			·598		
22.			11 A.M.	S.	41 51	75	S.W.	·599		
	−14 8	351 31	Noon.	weight 1 grain.	17 41			·604		
				S.	41 52		N.E.	·598	·601	·825
				weight 1 grain	17 45	67		·601		
23.			11 A.M.	S.	41 46			·601	·600	·823
	−13 43	352 01	Noon.	weight 1 grain.	17 50	70	S. by W. ½ W.	·599		
24.			10 30 A.M.	S.	41 47			·601		
			11 A.M.	N.	33 54			·607		
	−14 26	351 57	Noon.	S. and N.	58 36			·605	·601	·825
			0 15 P.M.	weight 1 grain.	17 54	77	S.	·597		
				weight 1 grain.	17 56			·596		
25.			10 15 A.M.	S.	41 47	77	S. by W.	·601		
	−15 3	351 54	Noon.	N.	33 59			·605	·601	·825
				S. and N.	58 44			·603		
			0 30 P.M.	weight 1 grain.	17 57	77		·596		
26.			11 A.M.	S.	41 51	78	S. by W.	·599	·597	·819
	−15 23	352 6	Noon.	weight 1 grain.	17 59			·595		
27.	−15 17	352 35	10 A.M.	S.	41 54	77	S.	·598	·598	·820
			11 A.M.	weight 1 grain.	17 55			·597		
28.	−15 19	353 13	10 A.M.	S.	42 1	76	E.N.E.	·595	·598	·820
				weight 1 grain.	17 48			·601		
29.			10 30 A.M.	S.	41 40	78	S.S.W.	·604	·604	·829
	−15 7	353 44	Noon.	weight 1 grain.	17 40			·605		
30.			11 0 A.M.	S.	41 46	77	S. ½ W.	·601	·601	·825
	−15 5	354 8	Noon.	weight 1 grain.	17 48		S. by W.	·601		
Feb. 3.	−15 55	354 17		S.	41 26			·610		
				S. and N.	58 18			·610		
	Sister's Walk,			N.	33 45		Observed	·611	·611	·838
	James Town.			weight 1 grain.	17 43	81	on shore.	·603		
	St. Helena.			weight 1½ grain.	26 36			·617		
				weight 2 grains.	37 13			·615		
5.				S.	42 35			·581		
				S. and N.	59 56			·584		
	Longwood.			N.	34 53		Observed	·585		
	St. Helena.			weight 1 grain.	18 13	69·7	on shore.	·587	·586	·804
				weight 1½ grain.	27 17			·601		
				weight 2 grains.	39 52			·579		
6.	St. Helena.		1 P.M.	S.	42 23	79	W.	·586		
				S.	42 26		N.W.	·585		
				S.	41 47		N.	·601		
				S.	41 52		N.E.	·599		
				S.	42 20		W.	·587	·591	·811
				S.	42 0		S.W.	·595		
				S.	42 19		S.	·587		
				S.	42 11		S.E.	·592		
				S.	42 19		E.	·587		
10.	−17 22	353 30	11 30 A.M.	S.	41 49	77	S.S.W. ½ W.	·601	·600	·823
	−17 30	353 26	5 P.M.	S.	41 51	74	S.W. ½ S.	·599		
11.			11 A.M.	S.	41 51			·599		
	−18 46	352 46	Noon.	weight 1 grain.	17 32	76	S.S.W. ½ W.	·609	·603	·827
			4 P.M.	S.	41 46			·601		
	−19 1	352 44	4 30 P.M.	S.	41 43			·603		

Table I. (Continued.)

1840.	Position. Lat.	Position. Long. E.	Time of day.	Method employed.	Deflection observed.	Thermo-meter.	Ship's head.	Intensity. London = 1·000.		Intensity. = 1·372.
	° ′	° ′	h m		° ′	°				
Feb. 12.	−20 41	352 0		S.	41 56	77	s.s.w.	·597		
				S and N.	58 41			·604		
				N.	34 29	76		·594		
			Noon.	weight 1 grain.	17 28	76	s.s.w. ½ w.	·612	·600	·823
			1 12 P.M.	weight 1 grain.	17 36			·607		
			1 30 P.M.	S.	41 57			·597		
			6 P.M.	S.	41 2	74	s.w. ½ w.	·597		
	−21 1	351 49	6 30 P.M.	S.	41 4	72	s.w. by s.	·596		
13.	−21 52	351 31	10 A.M.	S.	40 57	72	s. by E.	·599		
			10 30	S.	40 57	75		·599		
			10 45	S. and N.	57 34	76		·599		
			11 0	N.	34 1			·605	·599	·821
			11 30	S.	41 0	77	s.	·598		
	−22 12	351 23	Noon.	weight 1 grain.	18 1			·594		
			1 0 P.M.	weight 1 grain.	18 0	74	s. by w.	·594		
	−22 19	351 22	3 0	S.	41 4	74		·596		
	−22 23	351 22	5 0	S.	41 11	74		·594	·596	·818
			5 20	S.	41 5			·595		
			6 30	S.	40 56	73		·599		
14.	−23 33	351 10	7 A.M.	S.	40 41		s.s.w.	·604		
			8 30	S.	40 58	77	w.	·599		
	−23 37	351 0	9 30	S.	41 0			·595	·599	·821
			10 0	S. and N.	57 45			·597		
			10 40	N.	34 12			·599		
	−23 42	350 44	Noon.	weight 1 grain.	17 56			·596		
			1 30 P.M.	S.	40 58	78	E.	·599		
	−23 47	350 28	3 0	S.	41 5	76	w.	·595	·596	·818
			4 0	weight 1 grain.	18 0	75		·594		
	−23 51	350 16	5 30	S.	41 4	74		·596		
15.	−24 31	348 48	9 A.M.	S.	41 7	77	w.	·595		
			10	weight 1 grain.	17 50	78		·600		
			10 30	weight 1 grain.	17 51	78		·599		
			11 00	S.	41 12	80		·594	·596	·818
			11 30	S.	41 4	80		·596		
	−24 36	348 30	Noon.	S.	41 10	81		·595		
	−24 39	348 20	2 30 P.M.	S.	41 2	77		·597		
	−24 42	348 17	4 0	weight 1 grain.	17 45	74		·602		
			5 20	weight 1 grain.	17 45	75		·602		
	−24 42	348 10	6 0	S.	40 59	75		·598	·598	·820
			7 0	S.	41 12	74		·594		
	−25 0	348 0	Midnight.	S.	41 4	73		·596		
			0 40	weight 1 grain.	17 56	73	s.w.	·596		
16.	−25 15	347 59	6 A.M.	weight 1 grain.	17 51	72		·599		
			7	S.	40 49	73		·601		
			11	S.	40 57	80		·599	·598	·820
			11 30	S. and N.	58 13			·591		
	−25 24	347 49	Noon.	N.	34 9			·602		
			0 30 P.M.	weight 1 grain.	17 47	81		·602		
			1 0	weight 1½ grain.	27 18			·602		
			1 30	weight 2 grains.	38 11			·601	·605	·829
	−25 38	347 41	6 0	S.	40 13	76	s.w. by s.	·613		
			6 30	weight 1 grain.	17 36			·607		
17.	−26 8	347 03	10 A.M.	S.	40 50	77	w.	·601		
			10 30	S.	41 10	78	E.	·594	·602	·826
	−26 8	347 03	5 P.M.	S.	40 24	75	s. by E.	·609		
18.	−27 0	346 33	10 A.M.	S.	40 20	78	s.s.w.	·611		
			10 40	S. and N.	57 11			·605	·615	·844
			11 20	N.	33 19			·621		
	−27 6	346 32	Noon.	weight 1 grain.	17 7			·624		

TABLE I. (Continued.)

1840.	Position.		Time of day.	Method employed.	Deflection observed.	Thermo-meter.	Ship's head.	Intensity.		
	Lat.	Long. E.						London = 1·000.		= 1·372.
Feb. 19.	−27° 55′	346° 41′	10 A.M.	S.	40° 28′	78°	S.E.	·610		
			10 30	weight 1 grain.	17 27			·612	·607	·834
			11 10	weight 1½ grain.	27 20			·601		
	−27 57	346 46	Noon.	weight 2 grains.	37 47			·607		
20.			10 30 A.M.	S.	40 17	77	S.E.	·612		
			11 10	S. and N.	57 34			·599		
			11 40	N.	33 26			·618	·609	·836
	−28 57	348 32	Noon.	weight 1 grain.	17 29	79		·611		
	−29 8	349 0	5 P.M.	S.	40 35			·606		
21.	−30 1	351 29	9 30 A.M.	S.	40 1		S.E.	·618		
			10	weight 1 grain.	16 58			·629	·622	·852
	−30 28	351 45	5 30 P.M.	S.	40 1		S.E. ½ E.	·618		
22.	−30 59	353 23	7 A.M.	S.	39 48			·621		
	−31 7	353 46	10	S.	39 48			·621		
			10 30	S. and N.	57 7			·605		
			11 00	N.	32 51			·632	·619	·849
			11 30	weight 1 grain.	17 25			·610		
	−31 10	354 0	Noon.	weight 1½ grain.	26 27			·619		
	−31 17	354 34	4 40 P.M.	S.	39 32			·627		
23.	−31 46	356 38	11 30 A.M.	S.	39 4		S.E. by E.	·636		·872
24.	−31 13	358 38	10 A.M.	S.	39 9		E. ½ S.	·635		
			10 30	S.	39 7		E. by S.	·635	·636	·872
			11 00	weight 1 grain.	16 43			·638		
25.	−30 17	359 40	6 A.M.	S.	39 12		E.	·634		
			6 30	weight 1 grain.	17 1			·627		
			7 0	weight 1 grain.	17 0			·628		
	−30 18	359 55	10 0	S.	38 20		S.E.	·652		
			10 40	N.	32 6			·652	·640	·878
			11 10	S. and N.	55 37			·630		
	−30 14	359 55	Noon.	weight 1 grain.	16 29			·647		
	−30 30	359 48	5 30 P.M.	S.	38 22		S.W.	·653		
26.	−31 7	359 27	10 A.M.	S.	38 7		S. ½ W.	·658		
			10 20	S. and N.	55 16		S. by W.	·636		
			10 45	N.	32 3			·653		
			11 10	weight 1 grain.	16 50			·634	·647	·888
			11 40	S.	38 5		S.W.	·658		
	−31 9	359 24	Noon.	S.	38 31		W.	·644		
27.	−31 18	359 48	10 A.M.	S.	38 36	71	S.E.	·645		
			10 30	S. and N.	55 27			·633		
			11 20	N.	32 13			·649	·638	·876
	−31 20	359 57	Noon.	weight 1 grain.	17 0			·627		
28.	−32 1	2 17	10 30 A.M.	S.	38 33	72	S.E.	·645	·645	·886
			11 0	S.	38 34			·645		
29.	−32 39	4 18	11 A.M.	S.	37 43	70	S.E.	·666		·915
March 1.	−33 9	5 48	11 00	S.	37 52·5	71	S.E.	·663		
			11 30	S. and N.	54 3·5	71		·657	·665	·913
			Noon.	N.	31 16	71		·674		
2.	−33 23	7 41	6 40 A.M.	S.	37 39·7	70		·667		
			11 0	S.	37 23·8	71		·672		
	−33 27	7 20	5 0 P.M.	S.	37 27·7	71		·671		
			5 15	S. and N.	53 10·5	71	S.E. ½ E.	·674	·672	·922
			5 30	N.	30 52·5	71		·686		
			5 50	weight 1 grain.	15 56·2	70		·667		
			6 15	weight 1 grain.	15 57·8	70		·668		
3.	−33 21	9 4	3 40 P.M.	S.	37 12		W.S.W.	·678	·675	·925
			4 30	S.	37 28		E.N.E.	·671		

Table I. (Continued.)

1840.	Position. Lat.	Position. Long. E.	Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity. London = 1·000.		= 1·372.
	° ′	° ′	h m		° ′	°				
March 4.	−33 8	10 11	10 0 A.M.	S.	37 16·7	66		·677		
			10 30	N. and S.	53 20			·670		
			11 0	N.	31 1·5		S.E.	·681	·679	·932
			Noon.	weight 1 grain.	15 28	67		·687		
5.	−33 11	11 57	6 30 A.M.	S.	37 11	68	E.S.E.	·678		
			9 30	S.	37 11·7	68	S.E. ½ S.	·678		
			11 0	weight 1 grain.	15 30·2	68	S.E.	·686	·682	·935
			11 30	weight 1 grain.	15 32·2			·685		
6.	−32 57	14 00	10 A.M.	S.	36 39·5	69	S.E. by E.	·691		·947
7.	−32 33	15 24	3 15 P.M.	S.	36 25·4	72	E.S.E.	·697		·956
8.	−32 17	17 0	Noon.	S.	36 13	68	S.E. ½ S.	·702		·963
9.	−32 31	17 41	Noon.	S.	36 33·2	61	W. by N. ½ N.	·693		·951
10.	−32 45	16 37	0 30 P.M.	S.	36 29·5	63	S.E.	·694		·952
11.	−33 3	16 46	10 0 A.M.	S.	36 2·4			·707		·970
12.	−33 17	16 51	10 0 A.M.	S.	35 54·2	69	S.E. by S.	·711		
			10 30	S.	35 47·2	69		·713		
	−33 17	17 00	3 P.M.	S.	35 55·5	72		·711		
			3 30	S. and N.	50 56·6	72		·719	·720	·988
			3 50	N.	29 19·5	72	S. by E. ½ E.	·733		
			4 10	weight 1 grain.	14 36·7	71		·727		
			4 30	weight 1 grain.	14 42	71		·723		
13.			10 A.M.	S.	35 20	65		·723		
			10 30	S. and N.	50 57·2	65		·720		
			11 0	N.	29 28	65		·729		
			11 30	weight 1 grain.	14 42·2	64		·722		
	−33 56	18 10	Noon.	weight 1½ grain.	22 0·2	64		·735		
			0 30 P.M.	S.	35 20·2	65	S. by W.	·723	·725	·995
			1 30	S.	35 21	65		·723		
			1 50	S. and N.	50 55·2	66		·720		
			2 10	N.	29 26	66		·730		
			2 30	weight 1 grain.	14 40·3	66		·724		
14.	−34 20	17 57	10 A.M.	S.	35 38·9	61	E.S.E.	·715		·981
17.			10 A.M.	S.	35 34·5	71		·717		
			10 20	S. and N.	51 9·7	71		·715		
			10 40	N.	29 37·7	71	S.E.	·724		
			0 30 P.M.	weight 1 grain.	14 39·7	71		·724		
			1 0	weight 1 grain.	14 34·2	71		·729	·716	·982
				S.	35 46·2		N.E.	·712		
				S.	36 1·5		E.N.E.	·706		
				S.	35 59·5		E.	·706		
				S.	35 53·2		E.S.E.	·710		
18.	Single Anchor, Simon's Bay.			S.	35 39·4		S.E.	·715		
				S.	35 17			·724		
19.	Moored in Simon's Bay.			S.	35 47·6		E.S.E.	·711		
				S.	35 35		S.S.E.	·717		
				S.	35 25·8		S.	·721		
				S.	35 1		S.S.W.	·733		
			Noon.	S.	34 56·2		S.W.	·735		
				S.	35 45		W.S.W.	·713		
				S.	35 24		W.	·722		
				S.	35 31·8		W.N.W.	·718		
				S.	35 35		N.W.	·717		
				S.	35 24·8		N.N.W.	·722		
			4 P.M.	S.	35 26·3		N.	·721		
			6 P.M.	S.	35 39·2		N.N.E.	·715		
20.	Admiral's jetty.			S.	35 39·7	79	On shore.	·715		·981

TABLE I. (Continued.)

1840.	Position.		Time of day.	Method employed.	Deflection observed.	Thermo-meter.	Ship's head.	Intensity.		
	Lat.	Long. E.						London = 1·000.		= 1·372.
				S.	35° 09′·1	79°	S.	·729		
March 20.	Moored in Simon's Bay.			S.	35 16·2	76	S.W.	·726		
				S.	35 39·1		W.	·715		
	34 11	18 26		S.	35 50·7		N.W.	·710		
				S.	35 45·6		N.	·712		
				S.	35 48·9		N.E.	·711		
				S.	35 38·6		E.	·715		
	Block House Simon's Bay.			S.	35 39·3	80·5	Observed on shore.	·715		
				S. and N.	51 06·4	80·5		·716		
			Noon.	N.	29 54·2	80·5		·714		
				weight 1 grain.	14 48·9	87·5		·719		
				weight $1\frac{1}{2}$ grain.	22 57·8	87·5		·709		
25.			8 A.M.	S.	35 40·8	80·5		·715	·715	·981
				S. and N.	51 13·5	80·5		·714		
				N.	29 51·5	80·5		·716		
				weight 1 grain.	15 20·6	92		·695*		
				weight $1\frac{1}{2}$ grain.	22 42·4	91		·715		

Observations in the Terror.—The observations in the Terror were made with a Fox's needle of four inches diameter; one of equal size with that in the Erebus, which was not ready when the Expedition sailed, having been sent out subsequently, and received by Captain CROZIER, at Van Diemen Island, in August 1840. An instrument of only two inches radius, for the purpose of determining both the dip and intensity at sea, might previously have been regarded by many persons as scarcely more than a philosophical toy; and as little likely to yield results having the precision which is now required in such determinations. It has, however, in Captain CROZIER's hands, fully justified the expectations which Mr. Fox, from his own experiments with it, had ventured to entertain. On land, the instruments of the Erebus and Terror are, for the most part, as far as they have yet reached us, nearly identical in their results. Confining our attention to the *intensity* as the subject immediately before us, the intensities at James Town in St. Helena, and at Longwood in the same island, measured by the instruments of the two ships, the days and spots of observation being the same, are by the Erebus in the proportion of ·586 at Longwood to ·611 at James Town, and by the Terror as ·587 to ·611. The agreement is in this case the more valuable, because we are justified by it in ascribing the difference thus found between places so geographically near to each other, to a really existing difference (viz. to station error), rather than to accident or to observation error, as might have been done, had only a single instrument been used. A similar accord in the determinations of the two instruments is shown by the results at the Cape of Good Hope and Kerguelen Island, which, though more properly belonging to the next section, may be instanced here in evidence of the confirmation which the two instruments

* Omitted in the mean.

mutually afford each other; the Erebus making the intensity on shore at Christmas Harbour, in Kerguelen Island, to be as 1·068 to 0·715 at Simon's Bay, and the Terror as 1·0675 to 0·715. At sea, where in consequence of the motion of the ship, the inferior size of the four-inch instrument cannot be compensated by additional time given to the reading, or by other arrangments conducing to minute accuracy, the probable error of a single result appears, as might be expected, to be somewhat greater with the four inch-than with the $7\frac{1}{2}$-inch needle; but, with this reservation, the observations made at sea with the two instruments, when the ships were in company, are highly confirmatory each of the other.

The table which has been received from the Terror contains almost daily observations from the 1st of January 1840 until her arrival at the Cape of Good Hope in the following March. The intensities were observed both by deflectors and by constant weights, which latter, in the four-inch instrument, were ·5 and ·3 of a grain. St. Helena is the only land station observed at in the passage; the intensities observed at sea have therefore been computed relatively to the observations at James Town St. Helena, taken as a base station; and the value of the intensity at James Town has been taken as determined by the Erebus, viz. as 0·611, to unity in London, or as 0·838 to 1·372 in London. The values of w' for the Terror's deflectors N. and S, required, instead of a table of coercing weights, in computing the intensities when the deflectors were used, have been derived by the method already explained. Tables of these values for each degree of deflection are subjoined: neither on a careful examination of the observations, nor in the process of forming these tables, does there appear any reason to suppose that the deflectors or the needle sustained any change in magnetic condition during the period embraced by the observations under notice.

Values of w', Terror's Deflectors.	
N.	S.
° gr.	° gr.
38 = ·837	33 = ·732
39 = ·828	34 = ·726
40 = ·819	35 = ·721
41 = ·811	36 = ·716
42 = ·803	37 = ·711
43 = ·797	38 = ·707
44 = ·7925	39 = ·703
45 = ·791	40 = ·700
46 = ·7895	
47 = ·7885	

With the values of w' taken from this Table, the intensities at sea are obtained relatively to 0·611 at St. Helena (London = 1), by the formula

$$I' = \cdot 5393\, w' \operatorname{cosec} v'.$$

Table II.

Observations of the Magnetic Intensity on Shore, and on Board Her Majesty's Ship Terror, with a four-inch Fox's Needle.

1840.	Position. Lat.	Position. Long. E.	Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity. London = 1·000.		Intensity. = 1·372.
	° ′	° ′	h m		° ′	°				
Jan. 1.	−28 17	339 59	9 25 A.M.	N.	46 27	77	E.S.E.	·587	·591	·812
				S.	38 54	77		·604		
				weight ·5 grain.	26 50·5	77		·597		
				weight ·3 grain.	16 20·0	77		·575		
2.	−28 03	341 41	9 50 A.M.	N.	46 02·1	76	E. ½ N.	·593	·587	·808
				S.	39 57·0	76		·588		
				weight ·5 grain.	27 31·0	76		·583		
				weight ·3 grain.	16 08·0	76		·582		
2.	−27 48	341 53	5 0 P.M.	N.	45 35	76	N.E. ½ E.	·596	·597	·820
				S.	38 57	76		·603		
				weight ·5 grain.	27 18·5	76		·587		
				weight ·3 grain.	15 33	76		·603		
3.	−27 26	342 28	9 40 A.M.	N.	45 40	76	N.E. by E.	·595	·595	·817
				S.	39 01	76		·602		
				weight ·5 grain.	27 20	76		·587		
				weight ·3 grain.	15 41	76		·598		
4.	−26 50	342 58	9 40 A.M.	N.	45 03	76	N.E.	·602	·600	·824
				S.	39 03	76		·601		
				weight ·5 grain.	26 55	76		·595		
				weight ·3 grain.	15 33	76		·603		
5.	−25 50	342 55	10 00 A.M.	N.	45 25	76	N.E. by N.	·598	·603	·828
				S.	39 07·5	76		·600		
				weight ·5 grain.	26 18	76		·607		
				weight ·3 grain.	15 28	76		·607		
6.	−24 28	343 0	9 50 A.M.	N.	45 27	76		·598	·593	·815
				S.	39 26	76		·596		
				weight ·5 grain.	26 27	76		·605		
				weight ·3 grain.	16 27	76		·571		
7.	−22 56	343 30	10 00 A.M.	N.	45 34	73	N.E. ½ N.	·596	·594	·816
				S.	40 10	73		·585		
				weight ·5 grain.	26 57	73		·594		
				weight ·3 grain.	15 34	73		·602		
8.	−21 43	344 13	10 0 A.M.	N.	46 06	76	E.N.E.	·591	·589	·810
				S.	41 05·5	76		·574		
				weight ·5 grain.	26 32	76		·603		
				weight ·3 grain.	16 00·5	76		·586		
9.	−20 31	345 05	9 45 A.M.	N.	46 21	74	E. ½ N.	·588	·583	·800
				S.	40 23	74		·583		
				weight ·5 grain.	27 48	74		·578		
				weight ·3 grain.	16 07	74		·583		
10.	−19 12	345 45	9 00 A.M.	N.	46 04	76	N.N.F.	·591	·593	·815
				S.	40 02	76		·587		
				weight ·5 grain.	26 39	76		·600		
				weight ·3 grain.	15 40	76		·593		
11.	−17 44	346 10	10 00 A.M.	N.	45 51·5	78	N.E.	·594	·594	·816
				S.	39 48	78		·590		
				S.	39 21	78		·597		
				weight ·5 grain.	26 51	78		·595		
				weight ·3 grain.	15 47·5	78		·594		
12.	−17 23	346 29	9 00 A.M.	N.	46 05	76	N.E. by E. ½ E.	·591	·593	·815
				S.	40 25	76		·583		
				weight ·5 grain.	26 53	76		·596		
				weight ·3 grain.	15 38	76		·600		

TABLE II. (Continued.)

1840.	Position. Lat.	Position. Long. E.	Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity. London = 1·000.		Intensity. = 1·372.
Jan. 13.	−16° 43′	347° 02′	10h 0m A.M.	N.	45° 56′	74°	E. ½ N.	·593		
				N.	45 39	74		·595		
				S.	39 32	74		·594	·592	·812
				S.	39 45	74		·591		
				weight ·5 grain.	27 07	74		·591		
				weight ·3 grain.	15 55·5	74		·590		
14.	−15 25	347 50	9 40 A.M.	N.	46 50	76	E.N.E.	·583		
				S.	39 17	76		·598	·595	·816
				weight ·5 grain.	27 01	76		·593		
				weight ·3 grain.	15 26	76		·608		
15.	−15 30	347 58	9 10 A.M.	N.	46 18	76	N.E. by E.	·588		
				S.	39 04	76		·601	·598	·820
				weight ·5 grain.	27 20	76		·586		
				weight ·3 grain.	15 12	76		·617		
16.	−15 41	348 09	9 10 A.M.	N.	45 26	76	S.W. by S.	·598		
				S.	38 12	76		·616	·617	·847
				weight ·5 grain.	25 54	76		·616		
				weight ·3 grain.	14 40·5	76		·638		
17.	−15 37	348 32	9 45 A.M.	N	46 25	76	E. by N.	·587		
				S.	39 43	76		·591	·597	·818
				weight ·5 grain.	26 27	76		·604		
				weight ·3 grain.	15 32	76		·604		
18.	−14 45	349 22	9 45 A.M.	N.	46 10	76		·590		
				S.	39 24	76		·596	·598	·820
				weight ·5 grain.	26 40	76		·599		
				weight ·3 grain.	15 24	76		·609		
19.	−13 44	350 20	9 15 A.M.	N.	45 19	76		·599		
				S.	39 01	76		·602	·604	·829
				weight ·5 grain.	26 52	76		·595		
				weight ·3 grain.	15 08	76		·619		
20.	−14 28	350 19	9 20 A.M.	N.	45 39	76	S.W. ½ W.	·595		
				S.	38 49	76		·605	·605	·830
				weight ·5 grain.	26 31	76		·603		
				weight ·3 grain.	15 09	76		·619		
20.	−14 26	350 21	10 15 A.M.	N.	46 26	76	E.	·587		
				S.	39 29	76		·595	·602	·826
				weight ·5 grain.	27 14	76		·588		
				weight ·3 grain.	14 50	76		·637		
21.	−14 54	350 25	8 50 A.M.	N.	46 09	76	S.W. by S.	·590		
				S.	39 04	76		·601	·609	·836
				weight ·5 grain.	25 59	76		·614		
				weight ·3 grain.	14 51	76		·631		
21.	−14 53	350 26	9 50 A.M.	N.	46 06	76	E.N.E.	·591		
				S.	39 14	76		·598	·594	·815
				weight ·5 grain.	27 15	76		·588		
				weight ·3 grain.	15 36	76		·601		
22.	−14 08	350 28	9 40 A.M.	N.	45 23	76	S.W. by S.	·598		
				S.	38 59	76		·602	·609	·836
				weight ·5 grain.	26 05·5	76		·612		
				weight ·3 grain.	14 58	76		·626		
23.	−13 36	352 0	9 45 A.M.	N.	45 32	76		·597		
				S.	38 37	76		·609	·607	·834
				weight ·5 grain.	26 39	76		·600		
				weight ·3 grain.	15 07	76		·620		
24.	−14 19	351 53	9 10 A.M.	N.	45 21	76	S. ½ W.	·599		
				S.	38 19	76		·613	·608	·835
				weight ·5 grain.	26 33	76		·602		
				weight ·3 grain.	15 08	76		·619		

Table II. (Continued.)

1840.	Position. Lat.	Position. Long. E.	Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity. London = 1·000.		Intensity. = 1·372.
	° ′	° ′	h m		° ′	°				
Jan. 25.	−14 55	351 52	9 15 A.M.	N.	45 36	77	S.S.W.	·596	·604	·829
				S.	38 40	77		·608		
				weight ·5 grain.	26 39	77		·600		
				weight ·3 grain.	15 21	77		·611		
26.	−15 14	352 03	9 15 A.M.	N.	45 08	77		·601	·605	·830
				S.	38 32	77		·610		
				weight ·5 grain.	26 25	77		·607		
				weight ·3 grain.	15 31	77		·604		
27.	−15 11	352 32	9 15 A.M.	N.	45 31·5	77	E.N.E.	·597	·601	·825
			9 15	S.	38 27	77		·611		
			9 15	weight ·5 grain.	26 33	77		·602		
			9 15	weight ·3 grain.	15 45	77		·595		
27.	−15 13	352 33	10 20 A.M.	N.	45 0	77	S. ½ W.	·603	·611	·838
				S.	38 41	77		·608		
				weight ·5 grain.	25 40	77		·621		
				weight ·3 grain.	15 18·5	77		·612		
28.	−15 19	353 6	9 40 A.M.	N.	45 17	76	S.S.W.	·600	·607	·834
				S.	38 30	76		·610		
				weight ·5 grain.	26 29	76		·603		
				weight ·3 grain.	15 30	76		·615		
28.	−15 20	353 07	10 40 A.M.	N.	45 29	76	E.N.E.	·597	·604	·829
				S.	39 02	76		·602		
				weight ·5 grain.	25 56	76		·604		
				weight ·3 grain.	15 18	76		·613		
29.	−15 00	353 36	9 30 A.M.	N.	45 58	78	N.E. by E.	·592	·597	·818
				S.	39 14	78		·599		
				weight ·3 grain.	15 36	78		·601		
29.	−15 02	353 36	10 45 A.M.	N.	45 39	78	S. ½ W.	·595	·600	·824
				S.	38 28	78		·611		
				weight ·5 grain.	26 19·5	78		·607		
				weight ·3 grain.	15 58	78		·588		
30.	−15 10	354 5	10 10 A.M.	N.	45 47	77	S.S.W.	·594	·608	·835
				S.	38 37	77		·609		
				weight ·5 grain.	26 12	77		·609		
				weight ·3 grain.	15 10	77		·618		
31.	−15 40	354 19	9 15 A.M.	N.	45 03	78	S. by W.	·603	·598	·820
				S.	39 17	78		·598		
				weight ·5 grain.	27 02·4	78		·592		
				weight ·3 grain.	15 41	78		·598		
Feb. 3.	−15 55	354 17	0 45 P.M.	N.	44 21·2	81	Observed on shore.	·611	·611	·838
	Sister's Walk,			weight ·5 grain.	26 09·8	81		·611		
	St. Helena.			weight ·3 grain.	15 21·7	81		·611		
5.	Longwood.			N.	46 07	70		·591	·587	·805
				weight ·5 grain.	27 10	70		·589		
				weight ·5 grain.	27 06·5	70				
				weight ·3 grain.	16 07·1	70		·582		
				weight ·3 grain.	16 06·4	70				
10.	−17 14	353 33	9 40 A.M.	N.	44 42	77	S.W. by S.	·606	·600	·824
				S.	39 09	77		·600		
				S.	38 47	77		·606		
				weight ·5 grain.	26 46	77		·597		
				weight ·3 grain.	15 55	77		·590		
11.	18 33	352 52	9 15 A.M.	N.	45 12	76	S.W.	·601	·601	·825
				S.	39 04	76		·601		
12.	−20 22	352 06	9 20 A.M.	N.	45 10	77	S.S.W. ½ W.	·601	·598	·820
				S.	38 17	77		·598		
				weight ·5 grain.	26 20	77		·607		
				weight ·3 grain.	16 02	77		·585		

Table II. (Continued.)

1840.	Position. Lat.	Position. Long. E.	Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity. London = 1·000.		Intensity. = 1·372.
	° ′	° ′	h m		° ′	°				
Feb. 13.	−21 55	351 33	9 10 A.M.	N.	44 52·5	76	S.S.E.			
			9 24 A.M.	N.	45 04·3	76				
	−21 57	351 31	9 55 A.M.	N.	45 03·6	76				
			10 10 A.M.	N.	45 03·2	76		·603		·828
	−22 03	351 30	10 24 A.M.	N.	45 01·2	76				
			10 36 A.M.	N.	45 01·3	76				
	−22 05	351 28	10 55 A.M.	N.	44 58·5	76				
			11 05 A.M.	N.	45 06·2	76				
	−22 07	351 27	1 20 P.M.	N.	45 07·5	76				
			1 35 P.M.	N.	45 03·8	76	S. by W.	·602		·826
	−22 15	351 26	1 55 P.M.	N.	45 03·6	76				
			2 10 P.M.	N.	45 10	76	S. ½ W.			
	−22 20	351 22	5 55 P.M.	N.	45 00·2	74				
			6 10 P.M.	N.	45 00·6	74				
14.	−23 32	350 58	9 00 A.M.	weight ·5 grain.	26 36	77	W.	·601		
				weight ·3 grain.	16 05	77		·584		
				S.	39 02	77		·602		
				N.	45 50	77				
			9 20 A.M.	N.	45 40	77				
	−23 14	350 44	11 35 A.M.	N.	45 46	77		·594	·594	·815
			11 45 A.M.	N.	45 47	77				
	−23 48	350 27	3 40 P.M.	N.	45 52	77				
			4 00 P.M.	N.	45 47	77				
	−23 54	350 13	5 40	N.	45 40	77		·594		
			5 50	N.	45 49	77				
15.	−24 29	348 48	8 50 A.M.	weight ·5 grain.	27 08	77		·590		
			8 50 A.M.	weight ·3 grain.	16 14	77		·579		
			8 50 A.M.	S.	39 43·5	77		·591		
			8 50 A.M.	N.	45 24	77	W. by S.			
			8 58 A.M.	N.	45 26	77				
	−24 31	348 42	10 00 A.M.	N.	45 22	78		·598	·596	·817
			10 15 A.M.	N.	45 29	78				
	−24 35	348 36	11 40 A.M.	N.	45 21	80	W. by N.			
			Noon.	N.	45 32·5	80				
	−24 39	348 24	3 40 P.M.	N.	45 38	76	W.			
			3 50 P.M.	N.	45 41	76		·596		
	−24 41	348 19	5 35 P.M.	N.	45 28	75				
			5 50 P.M.	N.	45 35	75	W.S.W.			
16.	−25 18	347 54	8 50 A.M.	N.	44 41	80	S.S.W.	·606		
			9 20 A.M.	N.	44 41	80		·606		
			9 20 A.M.	S.	38 48	80		·605		
			9 20 A.M.	weight ·5 grain.	26 26	80		·605	·599	·822
			9 20 A.M.	weight ·3 grain.	16 12·5	80		·580		
17.	−26 03	347 07	8 40 A.M.	N.	45 05	77	W.S.W.	·602		
			9 30 A.M.	N.	45 01	77		·603		
			9 30 A.M.	S.	38 45	77		·606	·600	·823
			9 30 A.M.	weight ·5 grain.	26 53	77		·593		
			9 30 A.M.	weight ·3 grain.	15 43·5	77		·597		
18.	−26 51	346 37	9 15 A.M.	N.	44 44·7	78	S.W. by S.	·606		
				S.	38 48·0	78		·605	·604	·829
				weight ·5 grain.	27 13·7	78		·589		
				weight ·3 grain.	15 13·1	78		·616		
19.	−27 54	346 42	9 20 A.M.	N.	44 34·7	78	S.E.	·608		
				S.	38 01·9	78		·619	·607	·834
				weight ·5 grain.	26 28·7	78		·604		
				weight ·3 grain.	15 46·9	78		·595		
20.	−28 47	348 15	9 30 A.M.	N.	44 11·2	77	S.E. ½ S.	·613		
				S.	38 18	77		·614	·615	·844
				weight ·5 grain.	26 02	77		·613		
				weight ·3 grain.	15 08	77		·619		

Table II. (Continued.)

1840.	Position.		Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity.		
	Lat.	Long. E.						London = 1·000.		= 1·372.
	° ′	° ′	h m		° ′	°				
Feb. 21.	−29 56	350 42	8 45 A.M.	N.	44 24	79	S.E.	·610	·611	·838
				S.	38 28	79		·611		
22.	−31 00	353 40	9 20 A.M.	N.	43 18·5	79	S.E. ½ E.	·626	·625	·856
				S.	37 39·5	79		·625		
23.	−31 40	356 30	9 10 A.M.	N.	43 29·5	79	S.E. by E.	·622	·626	·857
				S	37 21·1	79		·630		
24.	−31 13	358 26	9 15 A.M.	N.	43 34	79	E. ½ S.	·621	·628	·862
				S.	37 03	79		·635		
25.	−30 10	359 53	9 00 A.M.	N.	43 14	75	E.N.E.	·627	·625	·858
				S.	37 33	75		·627		
				weight ·5 grain.	25 31	75		·625		
				weight ·3 grain.	15 04	75		·622		
25.	−30 12	359 54	10 00 A.M.	N.	43 04	75	S.S.W.	·629	·638	·876
				S.	36 23	75		·647		
26.	−31 07	359 28	9 20 A.M.	N.	42 21	71	S. by W.	·641	·640	·878
				S.	36 18	71		·649		
				weight ·5 grain.	25 21	71		·628		
				weight ·3 grain.	14 32·5	71		·644		
27.	−31 15	359 48	9 10 A.M.	N.	42 45·2	71	S E.	·634	·639	·876
				S.	37 01	71		·636		
				weight ·5 grain.	24 23	71		·651		
				weight ·3 grain.	14 45	71		·634		
28.	−31 57	2 02	9 00 A.M.	N.	42 15·6	72	S.E. ½ S.	·643	·647	·888
				S.	36 11·5	72		·651		
29.	−32 35	4 20	9 40 A.M.	N.	41 29·4	70		·656	·650	·892
				S.	36 33·4	70	S.E.	·644		
March 1.	−33 02	5 40	9 00 A.M.	N.	41 06	71		·664	·670	·919
				S.	34 59	71		·677		
2.	−33 20	7 32	9 10 A.M.	N.	41 01·5	71		·666	·668	·917
				S.	35 19	71		·671		
3.	−33 10	9 02	9 30 A.M.	N.	40 54·5	70	N.E.	·668	·673	·923
				S.	35 09·6	70		·674		
				S.	34 41·8	70		·683		
				weight ·5 grain.	23 39·3	70		·670		
				weight ·3 grain.	13 55·5	70		·673		
4.	−33 03	9 55	9 05 A.M.	N.	40 16·1	67	S.E. ½ S.	·681	·685	·940
				S.	34 24·2	67		·690		
5.	−33 08	11 43	9 15 A.M.	N.	39 45·5	68	S.E. by S.	·693	·698	·957
				S.	33 53·8	68		·702		
6.	−32 56	13 48	9 15 A.M.	N.	39 35·7	70	S.E. by E.	·696	·699	·959
				S.	33 51·1	70		·703		
7.	−32 14	15 20	9 30 A.M.	N.	39 10·5	70	E.S.E.	·705	·707	·970
				S.	32 35·7	70		·709		
8.	−32 16	16 52	9 20 A.M.	N.	39 17·2	68	S.E. ½ S.	·703	·711	·975
				S.	33 12	68		·719		
9.	−32 31	17 45	9 45 AM.	N.	39 49	61	N.W.	·691	·698	·957
				S.	33 43·2	61		·706		
10.	−32 44	16 27	9 00 A.M.	N.	38 32·9	63	S.E.	·720	·724	·994
				S.	32 51·6	63		·728		
11.	−33 01	16 41	9 20 A.M.	N.	39 03·7	69	S.E. ½ E.	·708	·712	·976
				S.	33 21·2	69		·716		
12.	−33 13	16 46	3 45 P.M.	N.	38 23·4	69	S.S.E.	·724	·732	1·004
				S.	32 18·1	69		·740		
13.	−33 52	18 04	9 0 A.M.	N.	38 35·6	65	S. by W.	·719	·722	·991
				S.	33 00	65		·725		
14.	−34 16	17 34	9 30 A.M.	N.	38 31·8	61	E. by N.	·721	·712	·976
				S.	33 50·7			·703		

Minimum Intensity.—In the passage from England to the Cape of Good Hope the Expedition traversed three times that large space of the Atlantic in which the magnetic intensity is less than in any other part of the surface of the globe; first in a southerly course, in and about the meridian of 330° E.; a second time in beating up to St. Helena, in and about the meridian of 345° E.; and a third time in the course from St. Helena to the Cape of Good Hope, in and about the meridian of 350° E.

Before we examine more particularly the results of the observations made during these traverses, it will be proper to clear them from the effects of the ship's iron, as far as the data furnished will enable us to do so.

It is obvious, on a simple inspection of the results in the tables, that, in the southern hemisphere, when the ship's head was on the points from S. E. to S.W., the intensity observed was generally slightly in excess, and on the contrary, when on the points from N.E. to N.W., slightly in defect; and that such was the case in both ships. At St. Helena and at the Cape of Good Hope, an endeavour was made to ascertain more precisely the effect of the ship's iron in modifying the results, by placing the ship's head successively on the principal points of the compass, and observing the intensity in each position. At St. Helena, the experiment failed, owing, apparently, to the disturbing influence of the island itself, which, even at the distance at which the vessels were anchored, was found to be sufficient to mask the local attraction of the ship, and to produce anomalies which were not experienced at sea. At the Cape, the geological character of the land interposed no such difficulty. The following Table shows the differences found at Simon's Bay between the intensity observed on each of the sixteen principal points of the compass, and the arithmetical mean of the whole. Each difference has the sign prefixed which would be required for a correction to the arithmetical mean. Allowing for discrepancies incidental to single observations, the general aspect of the differences is sufficiently systematic to justify us in regarding them as principally occasioned by the influence of the ship's iron.

Ship's head.	Corrections.		Mean of the two ships.	Ship's head.	Corrections.		Mean of the two ships.
	Erebus.	Terror.			Erebus.	Terror.	
E.	+ ·002	+ ·001	+ ·001	W.	— ·000	+ ·010	+ ·005
E.S.E.	+ ·006	+ ·004	+ ·005	W.N.W.	000	+ ·009	+ ·004
S.E.	— ·002	— ·004	— ·003	N.W.	+ ·005	+ ·012	+ ·008
S.S.E.	+ ·001	— ·004	— ·002	N.N.W.	— ·004	+ ·008	+ ·002
S.	— ·007	— ·015	— ·011	N.	+ ·002	+ ·012	+ ·007
S.S.W.	— ·015	— ·015	— ·015	N.N.E.	+ ·003	+ ·012	+ ·007
S.W.	— ·012	— ·007	— ·010	N.E.	+ ·007	+ ·004	+ ·005
W.S.W.	+ ·005	— ·004	000	E.N.E.		+ ·001	+ ·001

This experiment was repeated at Kerguelen Island, but with the ship's head placed only on the eight principal points: the season and weather were unfavourable, and the errors of observation were consequently greater than at the Cape; but the general indication is the same: the results are as follows:

Ship's head.	Differences from the mean.		Mean of the two ships.	Ship's head.	Differences from the mean.		Mean of the two ships.
	Erebus.	Terror.			Erebus.	Terror.	
E.	+ ·008	− ·003	+ ·002	W.	+ ·006	+ ·007	+ ·006
S.E.	− ·007	000	− ·003	N.W.	000	+ ·008	+ ·004
S.	− ·016	− ·027	− ·021	N.	+ ·007	+ ·005	+ ·006
S.W.	− ·014	+ ·001	− ·006	N.E.	+ ·014	+ ·008	+ ·011

The experiments at the Cape and Kerguelen Island agree in indicating the points of greatest disturbance to be from S.E. (through south) to S.W., causing an augmentation,—and from N.E. (through north) to N.W., causing a diminution,—in the regular magnetic intensity; the augmentation on the southerly points being rather greater than the diminution on the northerly, compensated by there being a greater number of the remaining points in defect than in excess; the latter points being affected in a minor degree. Considering that the differences shown in the two last Tables necessarily combine the errors of observation with the influence of local attraction, we may regard the effect of the ship's iron on the intensity needle as probably amounting, in extreme cases, to $\frac{1}{100}$th of the earth's magnetic force; but on much the greater number of points as probably far less than that amount. In Table III., which contains the results of the almost daily observations made in the Erebus between December 7, 1839, and February 29, 1840, in the space of the Atlantic comprised between the two portions of the isodynamic curve of 0·9, I have employed the following scale of correction*:

Ship's head	S.W. by S. to S.E. by S.	− ·008	Ship's head	W. and E.	+ ·001
	S.W. and S.E.	− ·007		W. by N. and E. by N.	+ ·002
	W.S.W. and E.S.E. . .	− ·002		W.N.W. and E.N.E. .	+ ·003
	W. by S. and E. by S. .	000		N.W. and N.E. . .	+ ·004
				N.W. by N. to N.E. by N.	+ ·005

* After the communication of this paper to the Royal Society, I received from Captain Crozier the results of a third experiment of the same kind, made in the Terror on the 20th of October 1840 in the river Derwent in Van Diemen Island. I subjoin these results in further evidence of the general correctness of the deductions which have been drawn in regard to the influence of the ship's iron on the intensity observations made at sea.

Ship's head.	Correction.	Ship's head.	Correction.
E.	+ ·001	W.	+ ·003
E.S.E.	− ·001	W.N.W.	000
S.E.	− ·005	N.W.	+ ·007
S.S.E.	− ·008	N.N.W.	+ ·005
S.	− ·008	N.	+ ·004
S.S.W.	− ·007	N.N.E.	+ ·005
S.W.	− ·005	N.E.	+ ·008
W.S.W.	+ ·001	E.N.E.	+ ·002

Table III.

Abstract of the Intensities observed in Her Majesty's Ship Erebus, in the space of the Atlantic comprised within the isodynamic curve of 0·9.

Position. Lat. ° ′	Position. Long. E. ° ′	Intensity.	Ship's head.	Correction for ship's head.	Corrected intensity. London = 1·372.
− 4 49	327 43	·921	S.S.W	−·008	·913
− 6 24	327 24	·897	S.	−·008	·889
− 7 50	327 28	·888	S.	−·008	·880
− 9 21	327 58	·870	S.S.E.	−·008	·862
−11 03	328 22	·856	S.S.E.	−·008	·848
−12 32	328 57	·840	S.E. by S.	−·008	·832
−14 0	329 28	·822	S.S.E.	−·008	·814
−15 04	330 06	·822	S.S.E.	−·008	·814
−16 52	330 27	·818	S. by E.	−·008	·810
−19 01	330 45	·814	S. ½ E.	−·008	·806
−21 31	330 47	·818	S.	−·008	·810
−21 47	330 50	·819	S.	−·008	·811
−23 14	330 55	·823	{ S. ½ W. / S.E. }	−·008	·815
−24 22	331 51	·829	{ S.E. by S. / S.S.E. }	−·008	·821
−25 40	332 46	·828	S.E. by E.	−·005	·823
−26 50	333 30	·839	{ S.S.E. / N. by E. }	−·004	·835
−26 12	333 22	·833	S.E.	−·007	·826
−27 04	334 13	·836	S.E. by E.	−·005	·831
−27 43	335 06	·845	{ S. by E. / N.N.E ½ E. }	−·002	·843
−26 53	335 26	·840	{ N.N.E. / S.S.E. }	−·002	·838
−26 01	335 20	·833	{ N. by E. / N.E. by N. }	+·005	·838
−25 21	335 28	·826	S.E.	−·007	·819
−26 12	336 12	·829	S.E. by E.	−·005	·824
−27 04	337 25	·832	S.E.	−·007	·825
−27 43	338 37	·833	E.S.E.	−·002	·831
−28 19	340 10	·828	E. by S.	000	·828
−28 01	341 45	·828	E.N.E.	+·003	·831
−27 26	342 29	·830	N.E. by E.	+·003	·833
−26 47	342 57	·824	N.E. by N.	+·005	·829
−25 34	342 58	·823	N.N.E.	+·005	·828
−24 10	343 04	·812		+·005	·817
−22 40	343 42	·811	{ N.E. / N.E. ½ E. }	+·004	·815
−21 30	344 17	·810	N.E. by E.	+·003	·813
−20 20	345 12	·810		+·003	·813
−18 53	345 46	·817		+·003	·820
−17 30	346 15	·820		+·003	·823
−17 11	346 40	·817		+·003	·820
−16 30	347 17	·816	N.E.	+·004	·820
−15 15	348 01	·821	N.E. by E. ½ E.	+·003	·824
−15 20	348 07	·813			
−15 49	348 09	·815	{ S.S.W. / E. by N. ½ N. }	−·003	·812

Position. Lat. ° ′	Position. Long. E. ° ′	Intensity.	Ship's head.	Correction for ship's head.	Corrected intensity. London = 1·372.
−15 30	348 51	·810	E.	+·001	·811
−14 33	349 37	·816	{ N.E. by E. / S.W. by S. }	−·001	·815
−13 37	350 33	·822	{ S.S.W. / E. by N. }	−·005	·817
−14 19	350 33	·813	E. ¼ N.	+·002	·815
−14 51	350 31	·815	{ E. W. / N. N.W. }	+·003	·818
−14 08	351 31	·825	{ S.W. / N.E. }	−·002	·823
−13 43	352 01	·823	S. by W. ½ W.	−·008	·815
−14 26	351 57	·825	S.	−·008	·817
−15 04	351 54	·825	S. by W.	−·008	·817
−15 23	352 06	·819		−·008	·811
−15 17	352 35	·820	S.	−·008	·812
−15 19	353 13	·820	E.N.E.	+·003	·823
−15 07	353 44	·829	S.S.W.	−·008	·821
−15 05	354 08	·825	S. by W.	−·008	·817
−17 26	353 28	·823	S.W.	−·007	·816
−18 53	352 45	·827	S.S.W.	−·008	·819
−20 51	351 55	·823		−·008	·815
−22 02	351 27	·821	S. by E.	−·008	·813
−22 21	351 22	·818	S. by W.	−·008	·810
−23 35	351 05	·821	{ W. / S.S.W. }	−·002	·819
−23 47	350 29	·818	{ W. / E. }	+·001	·819
−24 34	348 39	·818	W.	+·001	·819
−24 46	348 12	·820	{ W. / S.W. }	−·001	·819
−25 19	347 54	·820	S.W.	−·007	·813
−25 31	347 45	·829		−·007	·822
−26 08	347 03	·826	{ W. E. / S. by E. }	−·002	·824
−27 03	346 32	·844	S.S.W.	−·008	·836
−27 56	346 44	·834	S.E.	−·007	·827
−29 02	348 46	·836		−·007	·829
−30 14	351 37	·852		−·007	·845
−31 08	353 56	·849	S.E. ½ E.	−·006	·843
−31 46	356 38	·872	S.E. by E.	−·006	·866
−31 13	358 38	·872	E. by S.	000	·872
−30 20	359 50	·878	{ E. / S.E. / S.W. }	−·005	·873
−31 13	359 39	·882	{ S.E. / S.W. }	−·007	·875
−32 01	2 17	·886	S.E.	−·007	·879
−32 54	4 53	·914		−·007	·907

When these results are transferred to the map of the portion of the Atlantic to which they refer, and are examined in detail, their systematic character becomes much more obvious than in the Table, where, in consequence of the successive alternations of increasing and decreasing latitude, their consistency is not so easily followed by the eye. On attentive examination of the map it is not difficult to trace within small limits the course of an ideal line, which should connect the points in the several meridians, where the intensity was weakest at the epoch of Captain Ross's voyage. The determination of the position of this line is easier, and in some respects more sure, than that of an isodynamic line, because it is independent of the permanency of the magnetism of the needle employed, for more than the few days occupied in the immediate research; and it is also independent of the correctness of an assumed intensity at a base station. It is therefore to be expected that the position of this line will become in future years the subject of frequent examination, serving to mark, from time to time, the progress of the secular change in its position. This may be done with the more interest and advantage, because there is reason to believe that its position is changing rapidly in the space referred to, particularly in the eastern meridians; and that the southern magnetic hemisphere, in so far as its boundary may be indicated by this line, is in that quarter of the globe gaining rapidly upon the northern. In the first of the present series of "Contributions"*, the line of least intensity was drawn from observations corresponding nearly to the epoch of 1825, and this line of 1825 is lightly retraced in the present map for the purpose of comparison. It will be seen, that whilst its general direction is consistent with the observations of Captain Ross in 1840, its earlier position is everywhere three or four degrees south of that which would be now inferred. It is readily admitted that many of the observations from which the line of 1825 was drawn are inferior in precision to those of Captain Ross; and I rejoice in the late improvement in this class of observations, for which we are mainly indebted to the method and instrument devised by Mr. Fox, and to the zeal and unwearied patience of our naval officers. To an observer, however, who is proceeding in a nearly north and south direction, very little uncertainty attends the determination of the time and place at which he finds the weakest intensity; and if we compare the observations of Dunlop, Erman, and Sulivan, with those of Ross and Crozier, we invariably find that the earlier observer makes the place of the minimum a little more southerly than later determinations.

A glance at the map suffices to show where determinations are now most wanted, and to point out the track where additional observations would be most valuable: it would be nearly that of a vessel making the eastern passage to the Cape of Good Hope.

* Philosophical Transactions, 1840, Plate V.

§ 6. *Observations of Intensity between the Cape of Good Hope and Kerguelen Island.*

On the 6th of April 1840 the Expedition quitted Simon's Bay, and on the same night the Erebus and Terror parted company, and made their passage to Kerguelen Island on separate courses. Although the weather was very unfavourable, the practice of daily observation with the magnetical instruments was continued with very few exceptions, by the Erebus during the whole passage, and by the Terror from Simon's Bay as far as the meridian of the Crozet Islands, which was the first rendezvous. The observations of intensity on board the Erebus were chiefly made with deflector S, the other deflector N having been used only five times during the whole passage, whilst the number of observations with S amounts to thirty-six. For the values of w', in the case of deflector S, we have the comparisons with the constant weights at the Cape and Kerguelen Island, and three good intermediate comparisons at sea, viz. on the 11th, 12th, and 18th of April; a fourth attempt on the 1st of May failed from some accidental error in the observation with the constant weight. Pursuing the plan of graphical representation already described, we find that the line connecting the terminations of the ordinates at the Cape and at Kerguelen Island passes either through or extremely near the terminations of the other three ordinates, indicating the unchanged magnetism of the deflector; and we obtain the following Table of the values of w' for the degrees of deflection in the Table:

Values of w', deflector S, Erebus; Cape of Good Hope to Kerguelen Island.	
° grs.	° grs.
25 = 2·628	31 = 2·426
26 = 2·594	32 = 2·392
27 = 2·560	33 = 2·358
28 = 2·527	34 = 2·324
29 = 2·494	35 = 2·291
30 = 2·460	36 = 2·260

Regarding the Cape as the primary station, and its intensity = 0·715 (London = 1), the intensity at the other stations is given by the formula

$$I' = \cdot 1837\ w' \operatorname{cosec} v'.$$

The observations with deflector N between the Cape and Kerguelen Island being few, and the two intermediate comparisons at sea with the constant weights exhibiting considerable discordances, either from the unfavourable circumstances of weather, or possibly in consequence of an actual small change of force in the deflector, I have not attempted to deduce results from the observations either with deflector N, or with N and S combined. I have also omitted in the mean deductions the results of the observations with the constant weight of one grain on the 1st of May and 29th of June, these observations being obviously affected with some accidental error.

For the Terror's deflectors we have only the comparisons with the constant weights at the Cape and Kerguelen Island from which to derive the values of w' for the intermediate degrees of v'. Connecting the values of w' obtained by those comparisons for deflector N, with those in the former table for the same deflector, and presuming that the values corresponding to the intermediate degrees change in a nearly uniform progression, we derive the following Table for the degrees of v' observed between the Cape and Kerguelen Island:—

Values of w', deflector N, Terror; Cape of Good Hope to Kerguelen Island.	
° gr.	° gr.
26 = ·917	33 = ·873
27 = ·911	34 = ·866
28 = ·906	35 = ·859
29 = ·900	36 = ·852
30 = ·894	37 = ·845
31 = ·887	38 = ·837
32 = ·880	39 = ·828

The Cape being the primary station, and its intensity = 0·715, we obtain the intensities at the other stations by the formula

$$I' = \cdot 529\, w' \operatorname{cosec} v'.$$

In the case of deflector S, the values of w' which result from the comparisons with the constant weights at the Cape and Kerguelen Island are so nearly the same (·733 at the Cape, and ·735 at Kerguelen Island), that we may take the arithmetical mean ·734 for all the intermediate stations without sensible inconvenience; whence the formula for the calculation of the intensity becomes

$$I' = \cdot 388 \operatorname{cosec} v'.$$

As we have only the comparisons with the constant weights at the Cape and Kerguelen Island from which to derive the values of w' for the Terror's deflectors for all the intermediate degrees of v', we might be disposed to fear that the data were scarcely sufficient for that purpose; but when we examine the intensities deduced from the observations with the two deflectors (both having been used at all the intermediate stations except one), we perceive that their accordance is in general remarkably good, which would scarcely be the case unless the elements of calculation were tolerably correct. So close an agreement in the partial observations, in a passage made in tempestuous weather, is certainly very creditable both to the instrument and to the observers.

Those who interest themselves in examining the progress which magnetic maps of the portion of the globe occupied by sea are making towards accuracy, will compare the intensities between the Cape of Good Hope and Kerguelen Island, contained in the subjoined Tables, with the isodynamic lines drawn from Mr. Dunlop's observations in the first Number of these Contributions*. The prolongation of those lines into the more southerly latitudes traversed by the Erebus and Terror would suit extremely well with the intensities which are here given.

* Philosophical Transactions, 1840, Plate V.

Table IV.

Observations of the Magnetic Intensity on Shore and on Board Her Majesty's Ship Erebus, with Needle F 1, between the Cape of Good Hope and Kerguelen Island.

1840.	Position. Lat.	Position. Long. E.	Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity. London = 1·000.		Intensity. = 1·372.
	° ′	° ′	h m		° ′	°				
April 3.	−34 11	18 26		S.	35 35	72	W.	·717		·984
7.	−35 14	18 27	11 40 A.M.	S.	35 23	71·5	S. by E.	·723		·992
8.	−35 48	18 47	10 A.M.	S.	35 11·1	70	E.S.E.	·728		·999
			10 45	S.	35 12	70	W. by S.	·728		
9.	−36 4	19 19	10 A.M.	S.	35 29·3	66·5		·720		·988
10.	−36 11	20 42	9 40 A.M.	S.	35 0·7	66·5	S.E. by S.	·733		1·005
11.			10 15 A.M.	S.	34 36·2	66·5		·745		
			10 40 A.M.	S. and N.	49 24·4	66·5				
			11 0 A.M.	N.	28 54·5	66·5				
			11 30 A.M.	weight 1 grain.	14 16·2	71		·744	·742	1·018
11.	−36 35	21 20	Noon.	weight 1½ grain.	22 10·2	71	S.	·731		
			0 30 P.M.	weight 2 grains.	29 40·0	71		·750		
12.	−37 19	21 37	10 30 A.M.	S.	33 48·8	72·5		·769		
			11 A.M.	S.	33 21	72·5		·784	·770	1·057
			11 40	weight 1 grain.	13 54·2	72·5		·763		
12.	−37 20	21 37	2 15 P.M.	S.	33 53·1	72		·766		
13.	−38 13	21 30	10 40 A.M.	S.	34 0·7		W.S.W.	·763		1·047
14.	−40 5	20 38		S.	34 25·5	62	S.S.E.	·750		1·029
15.	−40 29	22 22	11 30 A.M.	S.	33 5·5	68·5	S.E. by S.	·792		1·087
16.	−41 24	25 0	9 30 A.M.	S.	33 29·1	56	S.E. by S.	·780		1·071
			10 10 A.M.	S. and N.	47 59·5	56				
			10 50 A.M.	N.	27 32·5	56				
17.	−41 58	26 38	9 20 A.M.	S.	32 52·7	61·5	S.S.E.	·799		1·096
18.	−43 7	28 43	10 A.M.	S.	32 33·2	60	S.S.E.	·810		
			10 30 A.M.	S. and N.	47 9	60				
			10 40 A.M.	N.	26 48	60				
			11 0 A.M.	weight 1 grain.	12 44·3	59		·830	·832	1·142
			11 20 A.M.	weight 1½ grain.	18? 6·5*	59		·841		
			11 45 A.M.	weight 2 grains.	25 53·3	59		·849		
19.	−44 19	31 6	11 30 A.M.	S.	31 58·6	59	S.S.E.	·830		1·139
20.	−45 44	34 16	11 15 A.M.	S.	31 11	48·5		·859		1·179
21.	−47 00	37 14		S.	30 56·2	45	S.E. by E.	·868		1·191
22.	−47 00	38 48	6 30 A.M.	S.	31 15·6	44		·856		1·175
23.	−46 46	42 41	9 45 A.M.	S.	30 3·4			·902		1·237
24.	−47 1	46 10		S.	29 23	45	S.E. ½ E.	·929		1·275
26.	−46 41	50 52	11 20 A.M.	S.	29 10·7	44	S.E. by S.	·937		1·285
28.	−46 28	52 43	Noon.	S.	29 6·2	44	W.S.W.	·941		1·290
29.	−46 29	52 26	1 30 P.M.	S.	28 36·7	43	S.W. by W.	·962		1·319
30.	−46 18	52 4	11 30 A.M.	S.	28 20·5		S.S.W.	·974		1·336
May 1.	−46 25	52 1	10 30 A.M.	S.	28 25	45	S. by E. ½ E.	·970		1·331
			11 0 A.M.	S. and N.	42 36·2					
			11 30 A.M.	N.	21 49					
			Noon.	weight 1 grain.	11 13·3			·939†		
2.	−46 57	55 39	10 15 A.M.	S.	28 23	47	S.E.	·972		1·333
3.	−47 19	59 10	10 30 A.M.	S.	27 33·5	40		1·009		1·384
			10 50 A.M.	S. and N.	42 0·5					
			11 10 A.M.	N.	21 36					
4.	−47 41	62 59	9 40 A.M.	S.	26 22·5	43		1·068		1·466
7.	−48 36	69 21	Noon.	S.	26 7·5		N.N.W.	1·082		1·485
8.	−48 36	69 7		S.	25 54·7	39	S.W. by S.	1·091		1·497
11.	−48 30	69 52	9 30 A.M.	S.	25 49·5		S.W. by W. ½ W.	1·095		1·502
12.	−48 39	68 57	11 30 A.M.	S.	26 19·2		N.	1·070	1·085	1·488
			0 30 P.M.	S.	25 45·5		S.W. by W. ½ W.	1·100		

* 18° is probably an error of transcription, and should be 19°; the result of 18° 06′·5 would be ·885; that of 19° 06′·5 is ·841, as entered in the Table.

† Omitted in the mean.

TABLE IV. (Continued.)

1840.	Position. Lat.	Position. Long. E.	Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity. London = 1·000.		Intensity. = 1·372.
May 18.	Christmas Harbour.		h 11 A.M.	S.	26° 19′·7	39°	N.W.	1·069		1·467
June 26.	−48 41	68 54	Noon.	S.	26 21·3	34·5	Observed on shore.	1·068	1·068	1·465
			to	S. and N.	40 42·7					
			4 P.M.	N.	20 6·3					
29.			10 A.M. to	weight 1 grain.	10 24·1			1·010*		
			2 P.M.	weight 1½ grain.	14 48·6			1·063		
				weight 2 grains.	20 19·6			1·073		
July 7.	Moored in Christmas Harbour.			S.	26 28·1		N.E.	1·062	1·076	
				S.	26 21·8		E.	1·068		
				S.	26 5·2		S.E.	1·083		
				S.	25 54·2		S.	1·092		
				S.	25 56·4		S.W.	1·090		
9.				S.	26 19·8	41	N.	1·069		
				S.	26 11·1		N.W.	1·076		
				S.	26 19·9		W.	1·070		

TABLE V.

Observations of the Magnetic Intensity on Shore and on Board Her Majesty's Ship Terror, with a four-inch Fox's Needle, between the Cape of Good Hope and Kerguelen Island.

1840.	Position. Lat.	Position. Long. E.	Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity. London = 1·000.		Intensity. = 1·372.
March 18.	Simon's Bay.		h m 7 A.M.	N.	38° 44′·1	°	N.W.	·702	·712	·977
	−34 11	18 26		N.	38 35·8		W.N.W.	·705		
			8 A.M.	N.	38 39		W.	·704		
				N.	38 04·4		W.S.W.	·718		
			6 P.M.	N.	38 43·7		N.	·702		
				N.	38 32·6		N.N.W.	·706		
			6 30 P.M.	N.	38 46·3		N.N.E.	·702		
				N.	38 23·5		N.E.	·710		
19.			9 A.M.	N.	38 13·7		E.N.E.	·713		
				N.	38 22·9		E.	·710		
			9 30 A.M.	N.	38 26·0		E.S.E.	·709		
				N.	38 02·1		S.E.	·718		
			10 0 A.M.	N.	38 04·3		S.S.E.	·718		
				N.	37 40·8		S.	·729		
			11 0 A.M.	N.	37 43·2		S.S.W.	·728		
				N.	37 58·5		S.W.	·720		
21.			Noon.	N.	38 07·1		Observed on shore.	·715	·715	·981
23.			11 30 A.M.	N.	38 16·2					
21.				S.	32 59·3			·715		
23.				S.	32 43·8					
21.				weight ·5 grain.	21 46·1			·715		
23.				weight ·5 grain.	21 47·9					
21.				weight ·3 grain.	12 38·2			·715		
23.				weight ·3 grain.	12 56·5					

* Omitted in the mean.

Table V. (Continued.)

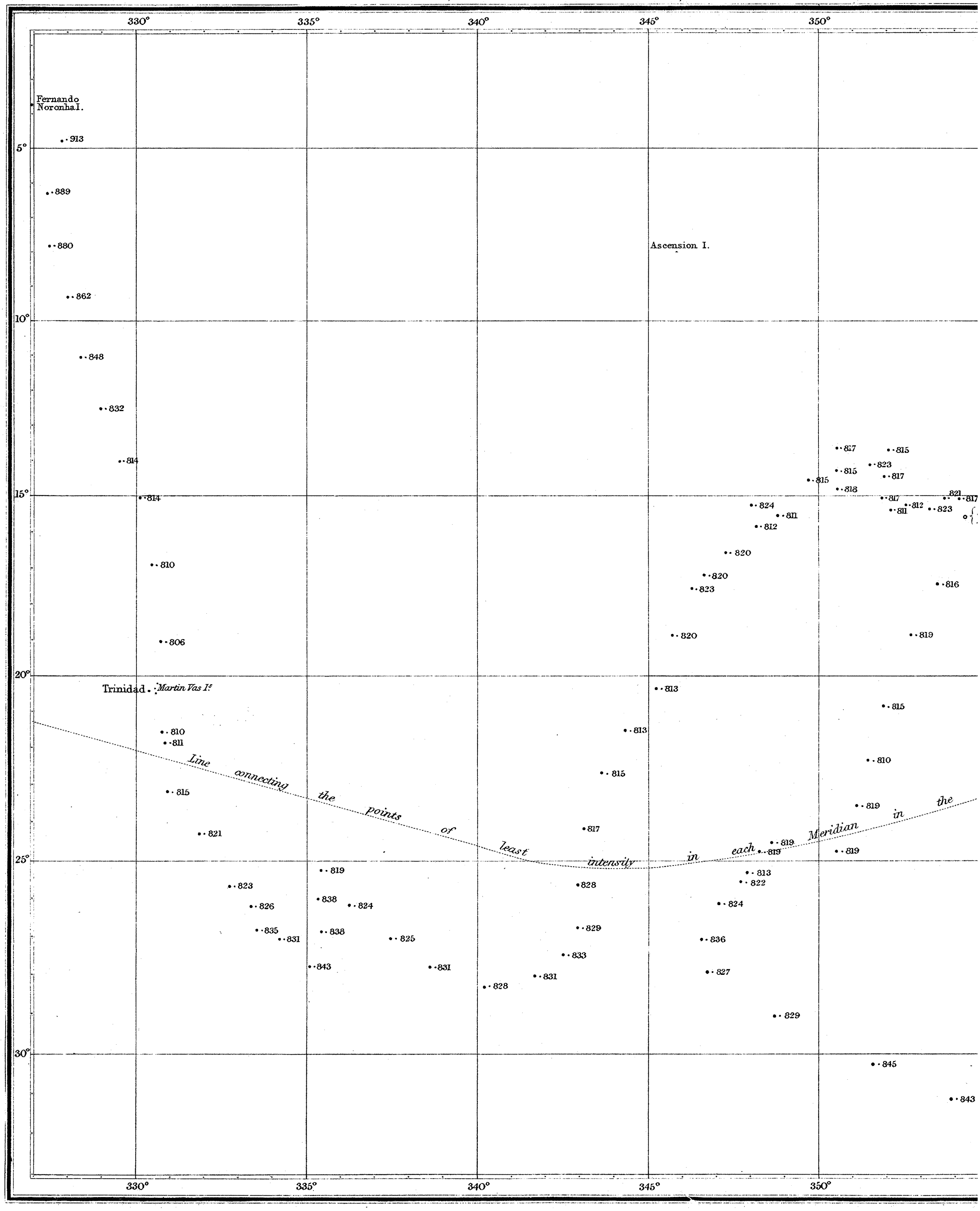
1840.	Position. Lat.	Position. Long. E.	Time of day.	Method employed.	Deflection observed.	Thermometer.	Ship's head.	Intensity. London = 1·000.		Intensity. = 1·372.
April 8.	−36° 16′	20° 04′	3 50 P.M.	N.	37° 31′·7	70°	S. by E.	·730	·731	1·003
				S.	32 00·2	70		·733		
10.	−36 52	18 25	9 20 A.M.	N.	37 53·1	66	W. ½ N.	·722	·724	·994
				S.	32 21·1	66		·726		
11.	−37 16	17 24	5 15 P.M.	N.	38 6	66	W.S.W.	·717	·722	·991
				S.	32 15·6	66		·728		
12.	−37 44	16 36	11 40 A.M.	N.	37 56·7	72	S.W.	·720	·721	·990
				S.	32 31·6			·722		
13.	−38 47	17 00	9 10 A.M.	N.	37 20·2	70	S.	·735	·734	1·007
				S.	31 59·9	70		·733		
14.	−38 58	17 26	9 05 A.M.	N.	36 47·8	62		·748	·750	1·028
				S.	31 07·4	62		·752		
15.	−40 45	19 20	3 50 P.M.	N.	36 49·4	68		·747	·760	1·044
				S.	30 09·7	68		·773		
16.	−42 40	22 02	3 45 P.M.	N.	35 37·7	56	S.E. by E.	·776	·775	1·063
				S.	30 11	56		·773		
17.	−42 56	23 12	9 30 A.M.	N.	35 21·7	61	S.	·782	·788	1·081
				S.	29 15·3	61		·795		
18.	−44 28	24 55	9 20 A.M.	N.	34 28·5	60		·807	·805	1·104
				S.	28 56·4	60		·803		
19.	−46 0	26 12	1 P.M.	N.	33 48·0	59	S.S.E.	·828		1·136
20.	−46 41	29 0	9 20 A.M.	N.	33 56·0	48	S.E. by E.	·821	·822	1·127
				S.	28 13·1	48		·822		
23.	−46 45	40 05	9 40 A.M.	N.	32 12·1	44	S.E. ½ E.	·873	·866	1·189
				S.	26 52·8	44		·859		
24.	−47 0	43 48	9 30 A.M.	N.	31 28·7	45		·896	·901	1·236
				S.	25 24·7	45		·905		
25.	−47 50	45 20	2 40 P.M.	N.	30 37·7	44		·924	·924	1·268
				S.	24 52·1	44		·924		
July 3.	Christmas Harbour, Kerguelen Island.		10 A.M.	N.	27 03·1	36	Observed on shore.	1·0675	1·0675	1·465
4.			2 P.M.	N.	26 41	36				
3.			A.M.	S.	21 31·3	36		1·0675		
4.			P.M.	S.	21 14·0	36				
3.	−48 41	68 54	A.M.	weight ·5 grain.	14 18·5	36		1·070		
4.			P.M.	weight ·5 grain.	14 13·7	36				
3.			A.M.	weight ·3 grain.	8 29·7	36		1·065		
4.			P.M.	weight ·3 grain.	8 29·5	36				
7.	−48 41	68 54	Noon.	N.	26 37·1	38	N.	1·079	1·084	
				N.	26 41·4	38	N.E.	1·076		
			1 0 P.M.	N.	26 26·2	38	E.	1·087		
				N.	26 29·8	38	S.E.	1·084		
			1 30 P.M.	N.	25 54·7	38	S.	1·111		
				N.	26 32·1	38	S.W.	1·083		
			2 0 P.M.	N.	26 40·3	38	W.	1·077		
				N.	26 40·8	38	N.W.	1·076		

Table VI.

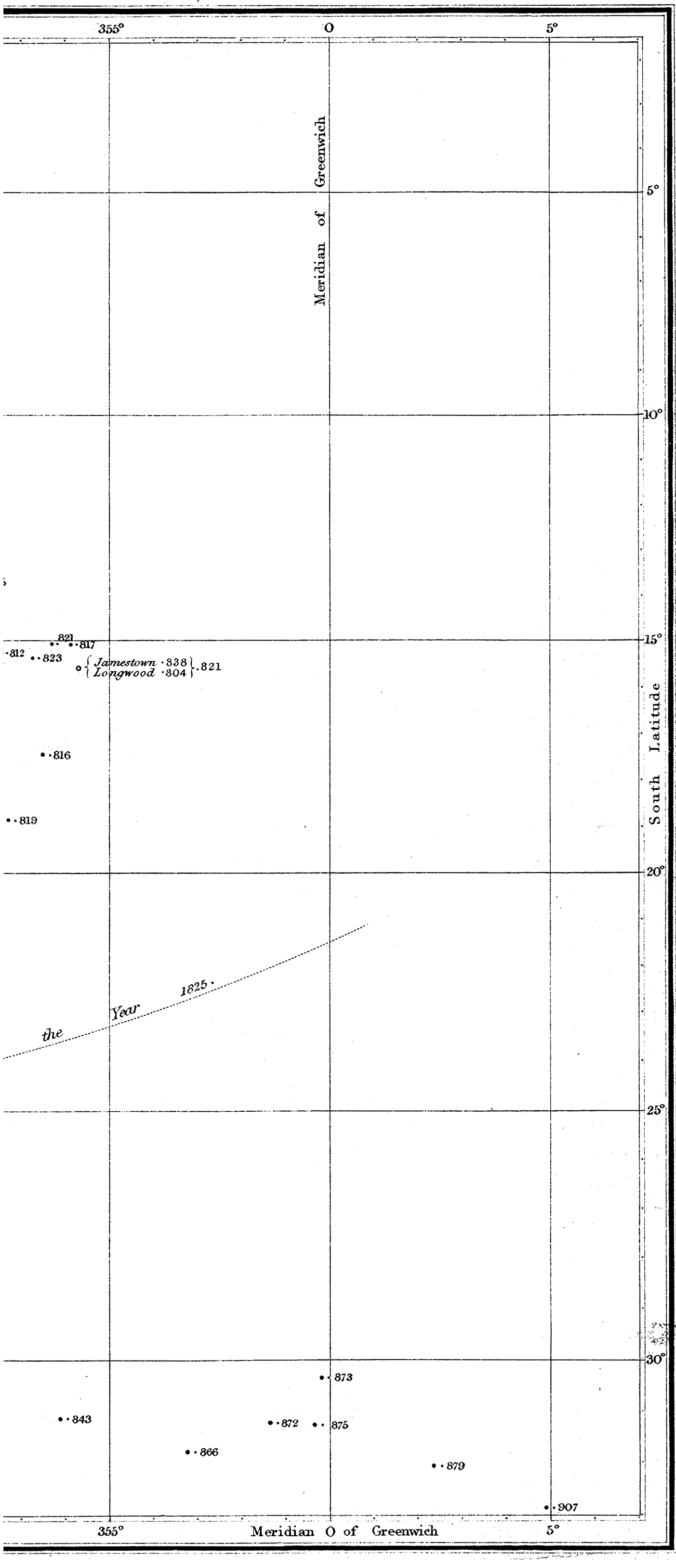
Abstract of the Intensities observed in Her Majesty's Ships Erebus and Terror between the Cape of Good Hope and Kerguelen Island.

Position.		In which ship observed.	Intensity.	Ship's head when at sea.	Correction for ship's head.	Corrected intensity. London = 1·372.
Lat.	Long. E.					
° ′	° ′					
−34 11	18 26	Erebus and Terror.	0·981	Observed on shore.		0·981
−37 44	16 36	Terror.	0·990	S.W.	−·007	0·983
−35 14	18 27	Erebus.	0·992	S. by E.	−·008	0·984
−36 04	19 19	Erebus.	0·988	W. by S.	·000	0·988
−37 16	17 24	Terror.	0·991	W.S.W.	−·002	0·989
−36 16	20 04	Terror.	1·003	S. by E.	−·008	0·995
−36 52	18 25	Terror.	0·994	W. $\frac{1}{2}$ N.	+·002	0·996
−36 11	20 42	Erebus.	1·005	S.E. by S.	−·008	0·997
−35 48	18 47	Erebus.	0·999	E.S.E. W. by S.	−·001	0·998
−38 47	17 00	Terror.	1·007		−·008	0·999
−36 35	21 20	Erebus.	1·018	S.	−·008	1·010
−38 58	17 26	Terror.	1·028		−·008	1·020
−40 05	20 38	Erebus.	1·029	S.S.E.	−·008	1·021
−40 45	19 20	Terror.	1·044	S.	−·008	1·036
−38 13	21 30	Erebus.	1·047	W.S.W.	−·002	1·045
−42 40	22 02	Terror.	1·063	S.E. by E.	−·005	1·058
−41 24	25 0	Erebus.	1·071	S.E. by S.	−·008	1·063
−42 56	23 12	Terror.	1·081	S.	−·008	1·073
−40 29	22 22	Erebus.	1·087	S.E. by S.	−·008	1·079
−41 58	26 38	Erebus.	1·096	S.S.E.	−·008	1·088
−44 28	24 55	Terror.	1·104	S.	−·008	1·096
−46 41	29 0	Terror.	1·127	S.E. by E.	−·005	1·122
−46 0	26 12	Terror.	1·136		−·008	1·128
−44 19	31 06	Erebus.	1·139	S.S.E.	−·008	1·131
−43 07	28 43	Erebus.	1·142		−·008	1·134
−47 00	38 48	Erebus.	1·175	S.E. by E.	−·005	1·170
−45 44	34 16	Erebus.	1·179	S.S.E.	−·008	1·171
−46 45	40 05	Terror.	1·189	S.E. $\frac{1}{2}$ E.	−·006	1·183
−47 00	37 14	Erebus.	1·191	S.E. by E.	−·005	1·186
−47 0	43 48	Terror.	1·236	S.E. $\frac{1}{2}$ E.	−·006	1·230
−46 46	42 41	Erebus.	1·237	S.E. by E.	−·005	1·232
−47 50	45 20	Terror.	1·268	S.E. $\frac{1}{2}$ S.	−·007	1·261
−47 01	46 10	Erebus.	1·275	S.E. $\frac{1}{2}$ E.	−·006	1·269
−46 41	50 52	Erebus.	1·285	S.E. by S.	−·008	1·277
−46 28	52 43	Erebus.	1·290	W.S.W.	−·002	1·288
−46 29	52 26	Erebus.	1·319	S.W. by W.	−·005	1·314
−46 25	52 01	Erebus.	1·331	S. by E. $\frac{1}{2}$ E.	−·008	1·323
−46 57	55 39	Erebus.	1·333	S.E.	−·007	1·326
−46 18	52 04	Erebus.	1·336	S.S.W.	−·008	1·328
−47 19	59 10	Erebus.	1·384	S.E.	−·007	1·377
−47 41	62 59	Erebus.	1·466		−·007	1·459
−48 41	68 54	Erebus and Terror.	1·465	Observed on shore.		1·465
−48 41	68 54	Erebus.	1·467	N.W.	+·004	1·471
−48 39	68 57	Erebus.	1·488	N. S.W. by W. $\frac{1}{2}$ W.	000	1·488
−48 36	69 07	Erebus.	1·497	S.W. by S.	−·008	1·489
−48 36	69 21	Erebus.	1·485	N.N.W.	+·005	1·490
−48 30	69 52	Erebus.	1·502	S.W. by W. $\frac{1}{2}$ W.	−·005	1·497

INTENSITY OF THE MAGNETIC FORCE OF THE EARTH, OBSERVED AT SEA IN 1840, ON BOARD HER MAJESTY'S SHIP

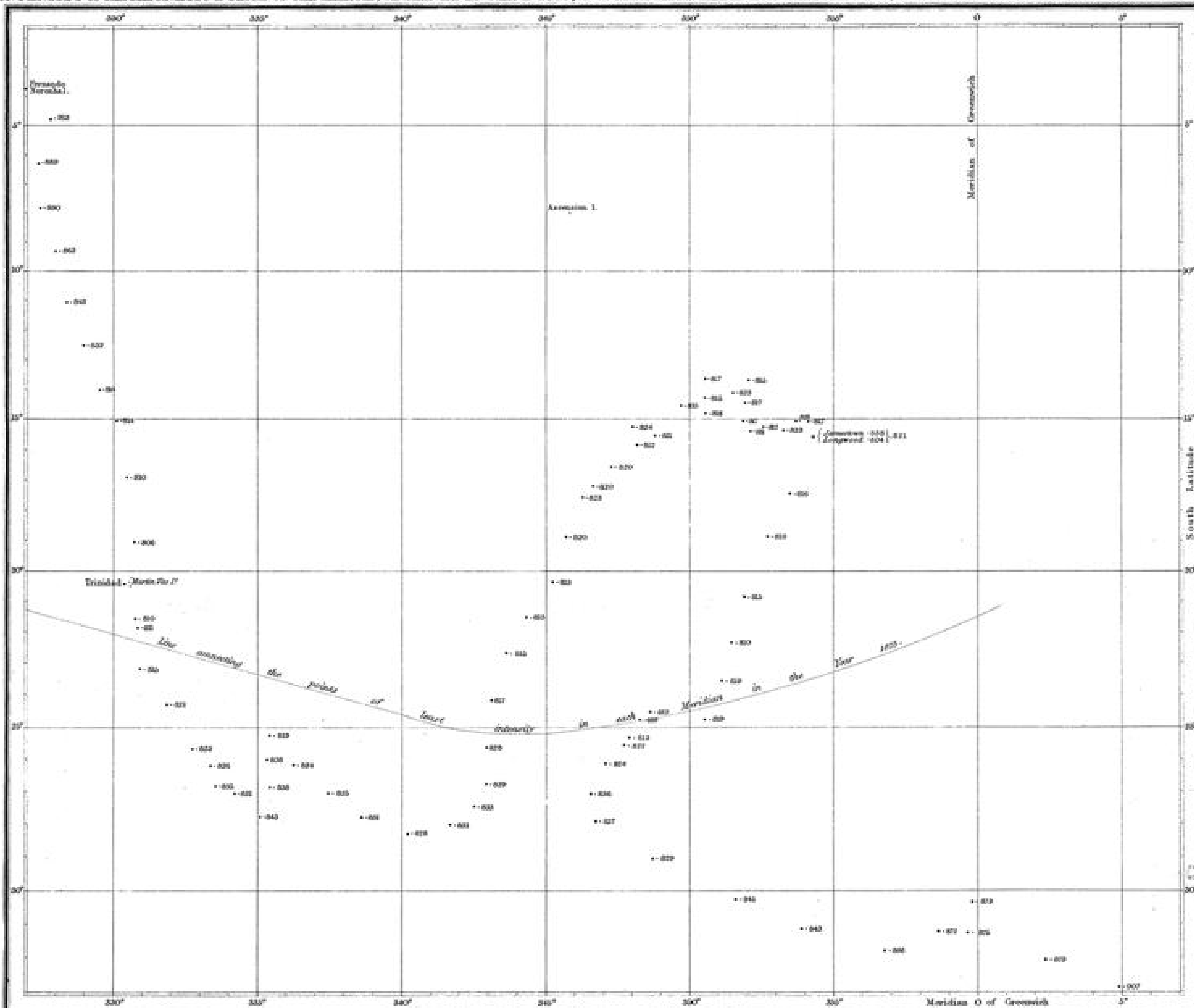


Y'S SHIP EREBUS, BY CAPT. JAMES CLARKE ROSS R.N. F.R.S.



Phil. Trans. 1842. Plate III. p. 9

INTENSITY OF THE MAGNETIC FORCE OF THE EARTH, OBSERVED AT SEA IN 1840, ON BOARD HER MAJESTY'S SHIP EREBUS, BY CAPT. JAMES CLARKE ROSS R.N. F.R.S.



Phil. Trans. 1842. Plate III.