M.O. 235 *f.*

AIR MINISTRY.

METEOROLOGICAL OFFICE.

BRITISH METEOROLOGICAL AND MAGNETIC YEAR BOOK, 1919.—Part IV.

HOURLY VALUES FROM AUTOGRAPHIC RECORDS: 1919.

COMPRISING

HOURLY READINGS OF TERRESTRIAL MAGNETISM AT ESKDALEMUIR OBSERVATORY

AND

SUMMARIES OF THE RESULTS OBTAINED

IN

TERRESTRIAL MAGNETISM, METEOROLOGY, AND ATMOSPHERIC ELECTRICITY
CHIEFLY BY MEANS OF SELF-RECORDING INSTRUMENTS AT THE OBSERVATORIES OF THE METEOROLOGICAL OFFICE.

IN CONTINUATION OF

The Reports of the National Physical Laboratory, 1900–1909, *and* (*in similar form*) *Summaries of Results of Geophysical and Meteorological Observations*, 1910, *the Reports of the Kew Committee of the Royal Society*, 1872–1899, *and of the Kew Observatory Committee of the British Association*, 1842–1871.

Published by Authority of the Meteorological Committee.

LONDON:
PRINTED AND PUBLISHED BY
HIS MAJESTY'S STATIONERY OFFICE.

To be purchased through any Bookseller or directly from
H.M. STATIONERY OFFICE at the following addresses:
IMPERIAL HOUSE, KINGSWAY, LONDON, W.C.2, and 28 ABINGDON STREET, LONDON, S.W.1;
36 PETER STREET, MANCHESTER; 1 ST. ANDREW'S CRESCENT, CARDIFF;
or 23 FORTH STREET, EDINBURGH.

1922.

Price 17*s.* 6*d. Net.*

PREFACE.

FOR the years 1911 to 1913, "Hourly Values from Autographic Records" was published in two sections. The issue of the first section, which contained hourly values of pressure, temperature, humidity, wind, rainfall, and sunshine, is now discontinued. The present volume represents the Section 2 of those three years, and is the ninth of the series. It may be regarded as a continuation in extended form of the tables and summaries giving the results of observations in terrestrial magnetism and atmospheric electricity which were included in the reports of the committee of management of the Kew Observatory from 1842 to 1910, and of tables published by the Meteorological Office in the *Quarterly Weather Report* from 1869 to 1880, and thereafter in *Hourly Readings*.

The tables of the present volume fall into three groups. In the first group the mean daily variation of the various meteorological elements is given for each month. The figures refer to the five observatories, Aberdeen, Eskdalemuir, Cahirciveen (Valencia Observatory), Richmond (Kew Observatory), and Falmouth.

In the second group fall Tables I to XLVIII, in which the readings of the magnetographs at Eskdalemuir Observatory for each hour throughout the year are set out, together with appropriate notes; Tables XLIX to LXIV, giving results deduced from these readings and corresponding figures for Kew Observatory; and Tables LXVII and LXVIII, in which magnetic data for various stations, British and foreign, are set out.

In the third group are the three tables which show the mean daily variation of potential gradient at Richmond and Eskdalemuir. The values from which the means have been computed are not published.

The tables are followed by notes on the management of the magnetic and electrical instruments and on results of interest. For notes on the meteorological instruments reference may be made to the Year Book, Part IV, Section 1, 1913, but notes on the Meteorological Summaries are included in this volume.

It is proper to add that in all matters concerning the scientific work of the observatories full advantage is taken of the advice of the Gassiot Committee, which was appointed for that purpose by the President and Council of the Royal Society in 1910, in accordance with the scheme approved by the Lords Commissioners of H.M. Treasury when the transfer of the administration of the observatories at Kew and Eskdalemuir was effected.

In particular, reference may be made to one point of great importance, namely, the units employed for the representation of the various quantities.

The letter of the Royal Society, dated 14th April 1910, which conveyed to the Meteorological Committee the information of the appointment of the Gassiot Committee, communicated also the following information as to the proceedings at the first meeting held on 13th April 1910 :—

> " The question of the units employed in the international publication of meteorological observations was discussed, and it was unanimously resolved—
>
> " (1) That in the opinion of the Gassiot Committee of the Royal Society it is essential that all meteorological returns compiled for international use should be expressed in terms of an international system of units founded on the metric system.
>
> " (2) That a system in which the measure of barometric pressure is expressed in megadynes per square centimetre, and of temperature in absolute degrees Centigrade, would be a satisfactory one."

In furtherance of the views expressed in these resolutions, and therefore departing from the traditional practice of printing meteorological results in Inch-Fahrenheit units in the same volume which gave electrical and magnetic results in C.G.S. units, the meteorological data have been given in C.G.S. units with temperature in absolute degrees.

In 1911, the first year of the British Meteorological and Magnetic Year Book, this principle was carried out in Part III, Section 2 (the *Geophysical Journal*), and in the two sections of Part IV. In 1912 it was adopted for Part III, Section 1 (*Daily Readings*). The expression of pressure in millibars in the *Monthly Weather Report* and in the maps of the *Weekly Weather Report*, Section 2, dates from 1914. Rainfall has been given in millimetres in the Monthly and Weekly Reports since the beginning of 1915; the use of Absolute Temperatures in the descriptive summaries and in the Tables of District-Values in those publications commenced in 1916.

Tables for conversion of meteorological data between Inch-Fahrenheit units and the units used in this publication are given in the 1913 volume and in the *Computer's Handbook*.

In carrying out the arrangement of the tables endeavour has been made to provide (1) that there shall be found an indication of the denomination of the units employed, and (2) that wherever the same quantity is represented the same unit shall be employed, so that the decimal point as regards a particular quantity always has the same meaning.

The exigencies of printing have made it necessary in the tables of diurnal inequalities to reduce the width of the column used to indicate the months and seasons to the space necessary for two letters at most. No difficulty can be experienced by the reduction of the names of the months to their initial letters, J, F, etc., standing for *January, February*, and so on, and in the same way Y will easily be appreciated as representing *Year*. But " W.," " Eq.," and " S.," standing for *Winter, Equinox*, and *Summer*, require some explanation. The Winter, which " W " represents in these tables, includes the months of *November, December, January, February;* the Summer, *May, June, July, August;* and the Equinox, the remaining four months of the year, viz., *September, October, March*, and *April*.

The year 1919 was the fourth in which " Summer Time " was introduced. The reader need not take this into consideration, however, as all the observations at the observatories are referred to Greenwich Mean Time.

(2023) Wt. 108/S.O.P. 565 613/773 375 10/22 Harrow G 69/1921/8 A 2

Some explanation of the insistence in this volume on the references to Richmond and Cahirciveen in connection with Kew Observatory and Valencia Observatory may be desirable.

Kew Observatory is in the Old Deer Park. This Park adjoins the Royal Gardens, Kew, but access to it is by Richmond, not by Kew, so that visitors coming by railway have to be warned not to book to either of the Kew stations. It is of interest to recall that there was once an observatory at Kew, and that some of Bradley's observations which led to the discovery of aberration were made there; the site, in front of Kew Palace, is marked by a sundial.* In the instructions prepared by the King's Observer, Dr. S. C. Demainbray, for the observation of the transit of Venus in 1769, the present observatory is referred to as Richmond Observatory.

The name of Valencia Observatory can be justified on historical grounds, though not geographically. The observatory was established on Valencia Island in 1867, and the instruments were transferred to Westwood House, Cahirciveen, in 1892. The distance between the two sites is about three miles.

The publication of meteorological and geophysical data for the year 1919 is arranged in accordance with the following scheme :—

(*a*) DAILY WEATHER REPORT.—

The *Daily Weather Report* for the first three months of 1919 contains meteorological information from 100 stations in or near Europe, of which about 40 are situated in the British Isles. The data include the morning and evening observations upon which the weather charts of North-Western Europe and the Eastern Atlantic are based. Some general information for the 24-hour period is given for all British and most foreign stations.

The form of presentation was recast on the 1st April, 1919, since when the *Daily Weather Report* has been issued in two sections—British and International.

The British Section contains detailed meteorological information from 40 British Stations in addition to general information for the 24-hour period from about 30 Health Resorts in the British Isles. An Upper Air Supplement to this section, giving upper air data from 30 stations, is also published daily.

The International Section contains meteorological data and synoptic charts of the morning and evening observations from about 80 stations in Europe and the Mediterranean.

(*b*) BRITISH METEOROLOGICAL AND MAGNETIC YEAR BOOK.—

The serial statistical publications of the Meteorological Office which have been grouped together under this title are as follows :—

Part I.—*Weekly Weather Report*, Weekly results of observations of the meteorological elements for stations and districts in the British Isles; Annual and Quarterly Appendices.

* "The History of the Kew Observatory," R. H. Scott, London, *Royal Soc. Proc.*, vol. xxxix., p. 1, 1885.

Part II.—*Monthly Weather Report*, prepared for issue at the end of the month to which it refers, and uniform with a summary issued annually.

Part III.—(1) *Daily Readings* at Stations of the First and Second Orders. Monthly parts and Annual Supplement.

(2) *Geophysical Journal* of the Observatories of the Meteorological Office. Monthly parts and Annual Supplement.

Part IV.—*Hourly Values from Autographic Records*. Meteorology, Terrestrial Magnetism, and Atmospheric Electricity.

Part V.—*Réseau Mondial*. Monthly and Annual Summaries of Pressure, Temperature, and Precipitation at Land Stations, generally two for each Ten-degree Square of Latitude and Longitude.

METEOROLOGICAL OFFICE,
SOUTH KENSINGTON, S.W. 7.
20th October, 1922.

TABLE OF CONTENTS.

HOURLY VALUES FROM AUTOGRAPHIC RECORDS. 1919.

LIST OF OBSERVATORIES.

	Latitude.	Longitude.	G.M.T. of Local Mean Noon.	Height above M.S.L. in metres.
Central Observatory:			h m	
Kew Observatory, RICHMOND, Surrey	51° 28′ N.	0° 19′ W.	12 1	5·5
Magnetic Observatory:				
ESKDALEMUIR, Dumfriesshire ..	55 19 N.	3 12 W.	12 13	242·0
Western Observatory:				
Valencia Observatory, CAHIRCIVEEN, Co. Kerry.	51 56 N.	10 15 W.	12 41	9·1
Auxiliary Observatories:				
ABERDEEN (Meteorology)	57 10 N.	2 6 W.	12 8	14·0
FALMOUTH (Meteorology)	50 9 N.	5 4 W.	12 20	50·8

Notes.—(1) The height given is that of the site of the rain-gauge. The heights of other meteorological instruments are shown under the appropriate Tables.

(2) Values printed in *italic* type in the following Tables are obtained by interpolation.

(3) Daily mean values are computed as $\frac{1}{24}\left\{\frac{1}{2}(0 + 24) + (1 + \text{----} + 23)\right\}$

HOURLY VALUES FROM AUTOGRAPHIC RECORDS.

PRESSURE AT STATION LEVEL: MONTHLY MEANS OF HOURLY VALUES.

**Readings in millibars at exact hours, Greenwich Mean Time.*

Aberdeen : H*b* (height of barometer cistern above M.S.L.) = 26·8 metres. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.
Jan.	00·73	00·66	00·63	00·56	00·41	00·38	00·35	00·47	00·71	00·99	01·25	01·37	01·29	01·21	01·16	01·27	01·42	01·53	01·53	01·63	01·65	01·57	01·46	01·32	01·24	01·08
Feb.	07·60	07·49	07·38	07·28	07·17	07·11	07·10	07·25	07·50	07·66	07·78	07·84	07·72	07·45	07·22	07·06	06·97	06·99	07·13	07·17	07·12	07·11	07·02	06·96	06·93	07·28
Mar.	05·52	05·43	05·23	04·86	04·53	04·33	04·35	04·46	04·58	04·74	04·80	04·80	04·79	04·67	04·62	04·54	04·58	04·67	04·89	05·16	05·29	05·36	05·30	05·29	05·15	04·86
April	08·00	07·85	07·66	07·47	07·37	07·27	07·39	07·53	07·62	07·65	07·76	07·77	07·77	07·77	07·69	07·73	07·70	07·76	07·92	08·07	08·27	08·27	08·23	08·18	08·10	07·78
May	15·63	15·59	15·46	15·35	15·37	15·45	15·59	15·77	15·95	16·08	16·13	16·12	16·06	15·98	15·91	15·79	15·72	15·60	15·63	15·78	15·97	16·14	16·25	16·25	16·20	15·83
June	12·58	12·49	12·34	12·20	12·16	12·20	12·30	12·37	12·49	12·46	12·36	12·33	12·22	12·18	12·08	12·05	12·00	11·88	11·93	11·97	12·03	12·22	12·30	12·20	12·11	12·21
July	14·28	14·20	14·07	13·88	13·81	13·79	13·80	13·83	13·90	13·92	13·92	13·84	13·85	13·75	13·69	13·65	13·63	13·64	13·71	13·89	14·06	14·22	14·32	14·36	14·29	13·92
Aug.	08·13	07·89	07·73	07·51	07·43	07·41	07·56	07·66	07·79	07·84	07·98	07·92	07·92	08·01	07·98	07·99	07·95	07·87	08·00	08·18	08·40	08·49	08·48	08·43	08·30	07·94
Sept.	07·63	07·45	07·24	07·07	06·96	07·00	07·12	07·30	07·49	07·60	07·65	07·53	07·51	07·36	07·12	06·98	06·93	07·03	07·18	07·41	07·60	07·63	07·62	07·52	07·39	07·33
Oct.	17·00	16·89	16·77	16·62	16·60	16·50	16·63	16·80	17·07	17·33	17·44	17·49	17·37	17·32	17·27	17·32	17·40	17·63	17·83	18·03	18·06	18·08	18·06	18·00	17·95	17·33
Nov.	05·27	05·15	05·10	04·93	04·72	04·65	04·55	04·66	04·81	04·99	05·04	05·00	04·77	04·62	04·49	04·47	04·53	04·49	04·49	04·53	04·56	04·45	04·37	04·29	04·16	04·68
Dec.	98·11	97·89	97·79	97·72	97·55	97·44	97·51	97·52	97·75	07·96	98·14	98·03	97·72	97·49	97·32	97·33	97·45	97·58	97·73	97·77	97·83	97·88	97·84	97·83	97·65	97·71
Year	08·37	08·25	08·12	07·96	07·84	07·79	07·85	07·97	08·14	08·27	08·35	08·34	08·25	08·15	08·05	08·02	08·02	08·06	08·16	08·30	08·40	08·45	08·44	08·39	08·29	08·16

Eskdalemuir : H*b* = 237·3 m. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.
Jan.	75·89	75·80	75·79	75·78	75·61	75·40	75·31	75·52	75·74	76·08	76·22	76·33	76·17	75·97	75·84	75·90	75·90	75·95	75·97	75·98	76·10	76·22	76·26	76·24	76·25	75·92
Feb.	81·15	81·03	80·95	80·83	80·70	80·60	80·59	80·71	80·94	81·06	81·15	81·21	80·99	80·73	80·37	80·21	80·17	80·28	80·46	80·53	80·59	80·66	80·69	80·66	80·68	80·71
Mar.	80·83	80·82	80·64	80·37	80·14	80·06	80·01	79·96	79·97	80·07	79·97	79·98	79·99	79·81	79·57	79·54	79·54	79·66	80·13	80·41	80·61	80·64	80·67	80·59	80·44	80·16
April	84·73	84·58	84·34	84·08	83·90	83·86	83·89	83·95	84·00	84·11	84·06	84·04	84·07	84·05	83·98	83·96	84·01	84·22	84·36	84·75	84·94	85·06	84·97	85·00	84·90	84·29
May	89·53	89·49	89·43	89·40	89·33	89·44	89·56	89·69	89·77	89·77	89·64	89·51	89·37	89·19	89·01	88·94	88·87	88·88	88·99	89·19	89·52	89·78	89·89	89·95	89·96	89·43
June	89·57	89·42	89·25	89·17	89·07	89·17	89·24	89·25	89·32	89·35	89·28	89·21	89·10	89·00	88·84	88·88	88·70	88·73	88·61	88·66	88·78	89·10	89·17	89·18	89·11	89·08
July	89·41	89·35	89·17	89·06	88·96	89·03	89·06	89·16	89·18	89·17	89·10	89·06	88·99	88·95	88·86	88·83	88·65	88·60	88·62	88·84	89·11	89·47	89·57	89·70	89·65	89·08
Aug.	85·35	85·28	85·07	84·86	84·70	84·72	84·78	84·91	85·06	85·16	85·07	85·04	85·06	85·09	85·13	85·09	85·04	85·07	85·17	85·36	85·58	85·73	85·70	85·55	85·40	85·15
Sept.	85·36	85·19	84·99	84·61	84·51	84·45	84·58	84·71	84·96	85·05	84·99	84·99	84·88	84·80	84·76	84·60	84·51	84·58	84·78	84·91	85·19	85·25	85·33	85·17	85·07	84·88
Oct.	92·99	92·90	92·74	92·54	92·44	92·39	92·42	92·59	92·78	92·91	92·91	92·84	92·79	92·62	92·57	92·53	92·59	92·89	93·25	93·51	93·61	93·75	93·79	93·83	93·82	92·94
Nov.	79·60	79·68	79·66	79·60	79·41	79·38	79·39	79·48	79·60	79·67	79·71	79·65	79·38	79·17	79·13	79·10	79·03	79·03	79·09	79·05	78·96	78·86	78·71	78·51	78·58	79·27
Dec.	74·77	74·56	74·54	74·62	74·65	74·70	74·69	74·78	74·94	75·32	75·35	75·34	75·12	74·84	74·66	74·68	74·62	74·72	74·71	74·72	74·71	74·65	74·60	74·52	74·43	74·78
Year	84·10	84·01	83·88	83·74	83·62	83·60	83·63	83·73	83·86	83·98	83·95	83·93	83·83	83·69	83·56	83·52	83·47	83·55	83·69	83·83	83·98	84·10	84·11	84·08	84·02	83·81

Cahirciveen (Valencia Obs.) : H*b* = 13·7 m. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.
Jan.	03·81	03·85	03·87	03·99	03·92	03·80	03·78	03·89	03·96	04·26	04·37	04·53	04·29	03·89	03·68	03·72	03·82	03·85	04·02	04·05	04·07	04·07	04·04	04·02	04·14	03·99
Feb.	03·38	03·24	03·07	02·81	02·54	02·28	02·25	01·99	02·20	02·45	02·53	02·59	02·59	02·43	02·25	02·13	02·06	02·09	02·22	02·44	02·55	02·65	02·68	02·61	02·67	02·49
Mar.	10·15	09·96	09·77	09·55	09·30	09·32	09·57	09·83	10·12	10·45	10·61	10·80	10·95	10·91	10·67	10·50	10·41	10·28	10·36	10·43	10·51	10·61	10·54	10·45	10·35	10·26
April	17·63	17·41	17·12	16·84	16·78	16·76	16·89	17·18	17·43	17·60	17·78	17·83	17·89	17·87	17·93	17·83	17·68	17·66	17·72	17·72	17·82	18·02	17·94	17·92	17·89	17·56
May	12·67	12·46	12·21	11·95	11·75	11·75	11·85	11·91	12·02	12·19	12·28	12·32	12·33	12·24	12·21	12·25	12·20	12·21	12·27	12·36	12·53	12·81	12·84	12·77	12·69	12·27
June	21·82	21·64	21·47	21·23	21·08	21·13	21·23	21·34	21·41	21·50	21·46	21·59	21·64	21·57	21·52	21·49	21·41	21·37	21·38	21·44	21·52	21·67	21·78	21·74	21·65	21·47
July	20·04	19·89	19·66	19·47	19·37	19·40	19·52	19·58	19·72	19·80	19·77	19·80	19·86	19·85	19·80	19·81	19·75	19·72	19·78	19·86	19·99	20·30	20·37	20·36	20·34	19·82
Aug.	16·38	16·26	16·00	15·78	15·62	15·57	15·65	15·83	15·99	16·08	16·19	16·23	16·29	16·32	16·32	16·25	16·09	16·06	16·12	16·13	16·22	16·35	16·28	16·16	16·06	16·08
Sept.	14·88	14·76	14·62	14·34	14·22	14·16	14·30	14·52	14·74	15·03	15·15	15·21	15·19	15·15	15·00	14·85	14·66	14·61	14·56	14·58	14·71	14·66	14·55	14·49	14·29	14·69
Oct.	22·55	22·48	22·38	22·14	22·03	22·02	22·10	22·23	22·47	22·75	22·85	22·96	22·90	22·71	22·60	22·54	22·55	22·73	23·04	23·25	23·44	23·62	23·69	23·75	23·76	22·77
Nov.	10·94	10·77	10·56	10·46	10·24	10·19	10·18	10·24	10·34	10·51	10·48	10·45	10·10	09·72	09·46	09·26	09·27	09·34	09·54	09·70	10·04	10·27	10·24	10·14	10·10	10·09
Dec.	07·72	07·54	07·35	07·33	07·13	07·02	07·03	07·03	07·08	07·20	07·23	07·12	06·65	06·15	05·92	05·88	06·05	06·18	06·29	06·49	06·65	06·83	06·86	06·91	06·97	06·80
Year	13·50	13·36	13·17	12·99	12·83	12·78	12·86	12·96	13·12	13·32	13·39	13·45	13·39	13·24	13·11	13·04	13·00	13·01	13·11	13·20	13·34	13·49	13·48	13·44	13·41	13·19

Richmond (Kew Obs.) : H*b* = 10·4 m. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.
Jan.	07·09	07·01	07·11	07·18	07·14	07·15	07·22	07·38	07·69	08·03	08·15	08·24	07·90	07·52	07·34	07·39	07·37	07·31	07·36	07·47	07·44	07·36	07·27	07·27	07·26	07·44
Feb.	07·95	07·92	07·82	07·72	07·62	07·56	07·60	07·75	07·98	08·11	08·23	08·24	07·96	07·60	07·16	07·02	06·98	07·04	07·21	07·38	07·51	07·68	07·71	07·73	07·75	07·64
Mar.	09·40	09·32	09·08	08·78	08·61	08·59	08·59	08·70	08·84	08·95	08·94	08·89	08·74	08·44	08·12	08·01	08·05	08·19	08·52	08·73	08·98	09·08	09·07	09·04	08·98	08·73
April	14·35	14·24	14·05	13·94	13·85	13·87	14·01	14·13	14·18	14·17	14·10	14·04	13·78	13·51	13·30	13·16	13·19	13·31	13·54	13·92	14·37	14·62	14·73	14·68	14·61	13·97
May	17·29	17·18	17·04	16·88	16·83	16·94	17·06	17·18	17·27	17·30	17·26	17·16	16·98	16·87	16·70	16·53	16·45	16·43	16·56	16·78	17·10	17·43	17·55	17·56	17·51	17·02
June	19·92	19·83	19·72	19·60	19·59	19·64	19·83	20·00	20·07	20·05	20·07	19·93	19·76	19·47	19·28	19·03	18·86	18·68	18·68	18·85	19·06	19·38	19·50	19·54	19·47	19·51
July	16·09	15·97	15·84	15·64	15·62	15·67	15·82	16·00	16·14	16·22	16·27	16·30	16·28	16·23	16·13	15·97	15·88	15·78	15·78	15·93	16·15	16·46	16·59	16·69	16·61	16·07
Aug.	15·88	15·79	15·65	15·53	15·45	15·47	15·60	15·68	15·78	15·71	15·71	15·52	15·31	15·17	15·02	14·78	14·72	14·65	14·78	15·02	15·44	15·62	15·77	15·82	15·81	15·41
Sept.	16·05	15·93	15·85	15·62	15·52	15·50	15·68	15·90	16·15	16·19	16·10	15·96	15·75	15·49	15·28	15·10	15·04	15·09	15·25	15·50	15·79	15·87	15·92	15·84	15·77	15·68
Oct.	20·45	20·49	20·38	20·27	20·20	20·23	20·34	20·57	20·75	20·73	20·78	20·66	20·40	20·06	19·89	19·69	19·74	19·89	20·19	20·37	20·61	20·77	20·88	20·95	21·01	20·40
Nov.	07·80	07·62	07·60	07·40	07·29	07·27	07·30	07·40	07·61	07·57	07·73	07·62	07·40	07·19	07·09	07·16	07·26	07·48	07·69	07·75	07·77	07·75	07·62	07·48	07·39	07·49
Dec	09·19	09·19	09·20	09·20	09·01	08·97	08·96	09·01	09·19	09·32	09·59	09·49	09·19	08·91	08·72	08·65	08·65	08·62	08·52	08·53	08·49	08·58	08·58	08·63	08·56	08·92
Year	13·46	13·37	13·28	13·15	13·06	13·07	13·17	13·31	13·47	13·53	13·58	13·50	13·29	13·04	12·84	12·71	12·68	12·71	12·84	13·02	13·23	13·39	13·43	13·44	13·39	13·19

* *Note.* 1. The initial 9 or 10 of the reading is omitted *i.e.* 1005·06 mb. is written 05·06 and 981·44 mb. becomes 81·44. 2. The latitude correction has been allowed for.

DIURNAL INEQUALITIES OF PRESSURE AT STATION LEVEL.

Departures from the mean of the day adjusted for non-periodic change.

Unit = 1 millibar.

Aberdeen. 1919.

M.T.	Midt.	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.
	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	m.b.
Jan.	−0·09	−0·18	−0·24	−0·33	−0·50	−0·54	−0·59	−0·50	−0·28	−0·02	+0·21	+0·32	+0·21	+0·12	+0·05	+0·13	+0·26	+0·35	+0·33	+0·41	+0·41	+0·30	+0·17	+0·01	−0·09
Feb.	−0·02	−0·10	−0·19	−0·25	−0·33	−0·37	−0·35	−0·17	+0·11	+0·29	+0·44	+0·53	+0·44	+0·20	−0·01	−0·13	−0·20	−0·15	+0·02	+0·09	+0·06	+0·08	+0·02	−0·01	−0·02
Mar.	+0·48	+0·41	+0·21	−0·14	−0·45	−0·63	−0·60	−0·48	−0·34	−0·17	−0·09	−0·07	−0·07	−0·17	−0·21	−0·28	−0·21	−0·11	+0·12	+0·41	+0·55	+0·64	+0·60	+0·60	+0·48
April	+0·27	+0·11	−0·08	−0·27	−0·38	−0·48	−0·37	−0·23	−0·14	−0·12	−0·02	−0·01	−0·01	−0·01	−0·10	−0·06	−0·10	−0·04	+0·11	+0·26	+0·45	+0·45	+0·41	+0·35	+0·27
May	+0·09	+0·02	−0·13	−0·26	−0·27	−0·22	−0·09	+0·06	+0·22	+0·32	+0·35	+0·32	+0·23	+0·13	+0·03	−0·11	−0·20	−0·35	−0·34	−0·21	−0·04	+0·10	+0·18	+0·16	+0·09
June	+0·13	+0·07	−0·07	−0·19	−0·21	−0·15	−0·03	+0·06	+0·20	+0·19	+0·11	+0·09	0·00	−0·01	−0·09	−0·11	−0·14	−0·24	−0·16	−0·11	−0·03	+0·18	+0·29	+0·20	+0·13
July	+0·37	+0·29	+0·16	−0·03	−0·10	−0·12	−0·12	−0·09	−0·02	0·00	0·00	−0·08	−0·07	−0·17	−0·23	−0·27	−0·29	−0·28	−0·21	−0·03	+0·14	+0·30	+0·40	+0·44	+0·37
Aug.	+0·27	+0·02	−0·15	−0·37	−0·46	−0·49	−0·34	−0·25	−0·13	−0·08	+0·05	−0·02	−0·02	+0·06	+0·02	+0·03	−0·02	−0·11	+0·01	+0·19	+0·40	+0·48	+0·46	+0·41	+0·27
Sept.	+0·19	+0·02	−0·18	−0·34	−0·45	−0·39	−0·27	−0·07	+0·13	+0·24	+0·31	+0·19	+0·18	+0·04	−0·18	−0·31	−0·35	−0·25	−0·09	+0·16	+0·35	+0·39	+0·39	+0·30	+0·19
Oct.	+0·14	0·00	−0·17	−0·35	−0·42	−0·56	−0·47	−0·33	−0·10	+0·12	+0·19	+0·20	+0·03	−0·05	−0·14	−0·13	−0·09	+0·10	+0·26	+0·42	+0·41	+0·40	+0·33	+0·23	+0·14
Nov.	+0·03	−0·04	−0·04	−0·17	−0·33	−0·36	−0·41	−0·25	−0·05	+0·17	+0·27	+0·27	+0·09	−0·02	−0·10	−0·07	+0·03	+0·04	+0·08	+0·17	+0·25	+0·18	+0·14	+0·12	+0·03
Dec.	+0·17	−0·03	−0·11	−0·16	−0·31	−0·40	−0·32	−0·28	−0·03	+0·19	+0·39	+0·30	+0·01	−0·20	−0·34	−0·32	−0·18	−0·03	+0·14	+0·20	+0·28	+0·35	+0·33	+0·34	+0·17
Year	+0·17	+0·05	−0·08	−0·24	−0·35	−0·39	−0·33	−0·21	−0·04	+0·09	+0·18	+0·17	+0·09	−0·01	−0·11	−0·14	−0·13	−0·09	+0·02	+0·16	+0·27	+0·32	+0·31	+0·26	+0·17

Eskdalemuir. 1919.

M.T.	Midt.	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.
	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.
Jan.	+0·15	+0·04	+0·02	0·00	−0·19	−0·41	−0·52	−0·32	−0·12	+0·20	+0·32	+0·42	+0·24	+0·04	−0·11	−0·07	−0·08	−0·05	−0·04	−0·05	+0·06	+0·16	+0·18	+0·15	+0·15
Feb.	+0·21	+0·11	+0·05	−0·06	−0·17	−0·25	−0·23	−0·10	+0·16	+0·30	+0·41	+0·49	+0·28	+0·04	−0·30	−0·44	−0·46	−0·33	−0·14	−0·05	+0·04	+0·13	+0·17	+0·17	+0·21
Mar.	+0·47	+0·48	+0·32	+0·06	−0·15	−0·21	−0·25	−0·28	−0·25	−0·14	−0·22	−0·19	−0·17	−0·33	−0·55	−0·57	−0·55	−0·42	+0·07	+0·37	+0·59	+0·63	+0·67	+0·62	+0·47
April	+0·53	+0·37	+0·12	−0·15	−0·34	−0·38	−0·36	−0·30	−0·27	−0·16	−0·21	−0·25	−0·22	−0·25	−0·33	−0·35	−0·31	−0·10	+0·03	+0·41	+0·59	+0·71	+0·61	+0·63	+0·53
May	+0·31	+0·26	+0·18	+0·13	+0·04	+0·13	+0·23	+0·34	+0·40	+0·39	+0·24	+0·10	−0·06	−0·25	−0·46	−0·55	−0·63	−0·64	−0·55	−0·36	−0·05	+0·19	+0·29	+0·32	+0·31
June	+0·26	+0·13	−0·01	−0·07	−0·15	−0·04	+0·05	+0·08	+0·17	+0·22	+0·16	+0·11	+0·02	−0·06	−0·19	−0·14	−0·30	−0·25	−0·35	−0·28	−0·15	+0·19	+0·28	+0·31	+0·26
July	+0·44	+0·37	+0·19	+0·07	−0·05	+0·02	+0·04	+0·12	+0·14	+0·11	+0·03	−0·01	−0·09	−0·15	−0·24	−0·29	−0·47	−0·53	−0·53	−0·32	−0·06	+0·29	+0·39	+0·51	+0·44
Aug.	+0·23	+0·15	−0·06	−0·27	−0·43	−0·42	−0·36	−0·23	−0·08	+0·02	−0·08	−0·11	−0·09	−0·06	−0·03	−0·07	−0·12	−0·09	+0·01	+0·20	+0·42	+0·56	+0·53	+0·38	+0·23
Sept.	+0·34	+0·18	−0·01	−0·38	−0·46	−0·51	−0·37	−0·22	+0·03	+0·14	+0·09	+0·10	+0·01	−0·06	−0·09	−0·24	−0·31	−0·23	−0·03	+0·12	+0·41	+0·49	+0·57	+0·43	+0·34
Oct.	+0·46	+0·33	+0·15	−0·09	−0·23	−0·31	−0·31	−0·18	−0·02	+0·07	+0·04	−0·07	−0·15	−0·36	−0·44	−0·52	−0·49	−0·22	+0·10	+0·32	+0·40	+0·50	+0·50	+0·51	+0·46
Nov.	−0·17	−0·05	−0·03	−0·05	−0·19	−0·18	−0·13	0·00	+0·17	+0·28	+0·36	+0·35	+0·12	−0·05	−0·05	−0·04	−0·06	−0·02	+0·08	+0·08	+0·03	−0·03	−0·13	−0·29	−0·17
Dec.	−0·18	−0·37	−0·38	−0·28	−0·24	−0·17	−0·17	−0·07	+0·11	+0·50	+0·54	+0·54	+0·35	+0·08	−0·08	−0·05	−0·10	+0·01	+0·02	+0·04	+0·04	0·00	−0·03	−0·10	−0·18
Year	+0·25	+0·17	+0·04	−0·09	−0·21	−0·23	−0·20	−0·10	+0·04	+0·16	+0·14	+0·12	+0·02	−0·12	−0·24	−0·28	−0·33	−0·24	−0·10	+0·04	+0·19	+0·32	+0·33	+0·30	+0·25

Fahirciveen (Valencia Obs.). 1919.

M.T.	Midt.	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.
	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.
Jan.	−0·02	+0·02	+0·02	+0·12	+0·04	−0·10	−0·13	−0·03	+0·03	+0·32	+0·41	+0·55	+0·31	−0·11	−0·33	−0·31	−0·22	−0·20	−0·05	−0·04	−0·03	−0·04	−0·08	−0·12	−0·02
Feb.	+0·54	+0·43	+0·29	+0·06	−0·19	−0·41	−0·42	−0·64	−0·41	−0·13	−0·02	+0·08	+0·10	−0·03	−0·18	−0·27	−0·30	−0·25	−0·09	+0·16	+0·30	+043	+0·49	+0·45	+0·54
Mar.	−0·01	−0·20	−0·40	−0·63	−0·89	−0·88	−0·64	−0·38	−0·10	+0·22	+0·37	+0·55	+0·69	+0·65	+0·40	+0·22	+0·12	−0·02	+0·05	+0·11	+0·19	+0·28	+0·20	+0·10	−0·01
April	+0·20	−0·02	−0·33	−0·62	−0·69	−0·72	−0·61	−0·32	−0·09	+0·08	+0·24	+0·28	+0·33	+0·30	+0·35	+0·24	+0·08	+0·05	+0·10	+0·09	+0·18	+0·37	+0·27	+0·24	+0·20
May	+0·41	+0·21	−0·05	−0·31	−0·51	−0·51	−0·41	−0·35	−0·25	−0·07	+0·02	+0·05	+0·06	−0·03	−0·05	−0·02	−0·07	−0·06	0·00	+0·09	+0·25	+0·54	+0·56	+0·49	+0·41
June	+0·26	+0·09	−0·07	−0·30	−0·45	−0·39	−0·28	−0·17	−0·09	+0·01	−0·03	+0·11	+0·17	+0·11	+0·06	+0·04	−0·04	−0·07	−0·05	+0·01	+0·10	+0·26	+0·38	+0·34	+0·26
July	+0·37	+0·21	−0·03	−0·23	−0·35	−0·33	−0·22	−0·17	−0·05	+0·01	−0·03	0·00	+0·04	+0·02	−0·05	−0·05	−0·12	−0·16	−0·11	−0·04	+0·08	+0·37	+0·43	+0·41	+0·37
Aug.	+0·14	+0·02	−0·22	−0·43	−0·57	−0·61	−0·52	−0·33	−0·15	−0·04	+0·08	+0·14	+0·21	+0·25	+0·26	+0·20	+0·06	+0·05	+0·12	+0·14	+0·25	+0·39	+0·33	+0·23	+0·14
Sept.	−0·11	−0·21	−0·32	−0·58	−0·67	−0·70	−0·54	−0·30	−0·05	+0·26	+0·41	+0·49	+0·49	+0·49	+0·36	+0·23	+0·07	+0·04	+0·01	+0·06	+0·22	+0·19	+0·10	+0·07	−0·11
Oct.	+0·39	+0·27	+0·12	−0·17	−0·34	−0·39	−0·37	−0·29	−0·09	+0·14	+0·19	+0·24	+0·13	−0·11	−0·27	−0·38	−0·41	−0·29	−0·03	+0·13	+0·27	+0·39	+0·42	+0·43	+0·39
Nov.	+0·43	+0·30	+0·13	+0·06	−0·12	−0·14	−0·11	−0·02	+0·12	+0·32	+0·33	+0·33	+0·02	−0·33	−0·56	−0·72	−0·67	−0·57	−0·34	−0·14	+0·24	+0·50	+0·51	+0·44	+0·43
Dec.	+0·54	+0·39	+0·24	+0·25	+0·08	−0·01	+0·04	+0·07	+0·16	+0·31	+0·37	+0·28	−0·15	−0·62	−0·83	−0·83	−0·63	−0·47	−0·32	−0·09	+0·10	+0·30	+0·37	+0·45	+0·54
Year	+0·26	+0·13	−0·05	−0·23	−0·39	−0·43	−0·35	−0·25	−0·08	+0·12	+0·19	+0·26	+0·20	+0·05	−0·07	−0·14	−0·18	−0·16	−0·06	+0·04	+0·18	+0·33	+0·33	+0·29	+0·26

Richmond (Kew Obs.). 1919.

M.T.	Midt.	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.
	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.	mb.
Jan.	−0·26	−0·35	−0·25	−0·19	−0·24	−0·24	−0·17	−0·02	+0·28	+0·61	+0·73	+0·81	+0·46	+0·08	−0·12	−0·07	−0·10	−0·16	−0·12	−0·01	−0·06	−0·14	−0·24	−0·24	−0·26
Feb.	+0·21	+0·19	+0·09	0·00	−0·09	−0·14	−0·09	+0·07	+0·30	+0·45	+0·57	+0·59	+0·32	−0·03	−0·46	−0·59	−0·63	−0·56	−0·38	−0·21	−0·06	+0·12	+0·15	+0·18	+0·21
Mar.	+0·46	+0·40	+0·18	−0·10	−0·25	−0·25	−0·24	−0·12	+0·04	+0·17	+0·17	+0·14	+0·01	−0·27	−0·57	−0·67	−0·61	−0·45	−0·10	+0·12	+0·39	+0·51	+0·52	+0·50	+0·46
April	+0·51	+0·39	+0·19	+0·07	−0·03	−0·02	+0·11	+0·22	+0·26	+0·23	+0·15	+0·09	−0·19	−0·47	−0·69	−0·83	−0·81	−0·71	−0·49	−0·12	+0·32	+0·56	+0·66	+0·60	+0·51
May	+0·38	+0·26	+0·11	−0·06	−0·12	−0·02	+0·10	+0·21	+0·29	+0·31	+0·25	+0·16	−0·04	−0·16	−0·34	−0·52	−0·60	−0·63	−0·51	−0·30	+0·01	+0·33	+0·44	+0·44	+0·38
June	+0·19	+0·12	+0·02	−0·08	−0·07	+0·01	+0·21	+0·40	+0·49	+0·49	+0·52	+0·40	+0·26	−0·02	−0·19	−0·41	−0·57	−0·73	−0·71	−0·52	−0·29	+0·05	+0·18	+0·25	+0·19
July	+0·28	+0·14	−0·01	−0·24	−0·28	−0·25	−0·12	+0·03	+0·15	+0·22	+0·24	+0·25	+0·21	+0·14	+0·01	−0·17	−0·28	−0·40	−0·42	−0·30	−0·10	+0·20	+0·31	+0·38	+0·28
Aug.	+0·43	+0·35	+0·21	+0·09	+0·01	+0·04	+0·17	+0·26	+0·36	+0·29	+0·29	+0·11	−0·10	−0·24	−0·39	−0·62	−0·68	−0·74	−0·61	−0·37	+0·05	+0·24	+0·39	+0·44	+0·43
Sept.	+0·23	+0·12	+0·05	−0·17	−0·25	−0·26	−0·07	+0·16	+0·42	+0·48	+0·40	+0·27	+0·07	−0·17	−0 37	−0·54	−0·59	−0·52	−0·35	−0·10	+0·21	+0·30	+0·37	+0·30	+0·23
Oct.	+0·32	+0·35	+0·22	+0·09	−0·01	−0·01	+0·08	+0·29	+0·45	+0·40	+0·43	+0·28	0·00	−0·36	−0·55	−0·77	−0·75	−0·63	−0·35	−0·20	+0·02	+0·16	+0·25	+0·30	+0·33
Nov.	+0·11	−0·05	−0·06	−0·24	−0·33	−0·34	−0·29	−0·17	+0·05	+0·03	+0·21	+0·12	−0·08	−0·28	−0·36	−0·28	−0·15	+0·08	+0·31	+0·39	+0·42	+0·42	+0·31	+0·19	+0·11
Dec.	−0·04	−0·01	+0·02	+0·05	−0·11	−0·13	−0·12	−0·04	+0·16	+0·32	+0·62	+0·55	+0·27	+0·01	−0·14	−0·19	−0·17	−0·17	−0·25	−0·21	−0·22	−0·10	−0·08	0·00	−0·04
Year	+0·23	+0·16	+0·06	−0·07	−0·15	−0·13	−0·04	+0·11	+0·27	+0·33	+0·38	+0·31	+0·10	−0·15	−0·35	−0·47	−0·49	−0·47	−0·33	−0·15	+0·06	+0·22	+0·27	+0·28	+0·23

Note.—The entry for the hour n is X_n where $X_n = p_n - \bar{p} - (n-12)\,(p_{24}-p_0)/24$, p_n being the pressure at hour n and $\bar{p}$ the mean for 24 hours.

HOURLY VALUES FROM AUTOGRAPHIC RECORDS.

TEMPERATURE: MONTHLY MEANS OF HOURLY VALUES.

** Readings, in degrees absolute, at exact hours, Greenwich Mean Time.*

Aberdeen : North Wall Screen on Tower : h*t* (height of thermometer bulb above the ground) = 12·5 metres. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	a	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*
Jan.	76·4	76·3	76·2	76·1	76·1	76·1	76·0	76·0	76·3	76·4	76·8	77·4	77·1	77·4	77·5	77·5	77·2	77·1	76·9	76·8	76·7	76·6	76·5	76·5	76·4	76·7
Feb.	74·4	74·3	74·1	74·0	73·9	73·7	73·7	73·6	73·6	74·0	74·6	75·2	75·9	76·2	76·4	76·3	76·1	75·8	75·5	75·2	75·0	74·8	74·8	74·6	74·4	74·8
Mar.	74·4	74·2	74·1	74·0	74·0	73·9	73·9	73·9	74·5	75·3	75·9	76·4	76·7	77·0	77·0	77·0	76·6	76·4	76·0	75·5	75·2	74·9	74·7	74·5	74·4	75·3
April	78·4	78·2	78·0	77·9	77·7	77·8	78·0	78·8	79·4	80·4	81·0	81·5	81·9	82·1	82·3	82·1	82·0	81·8	81·3	80·7	80·0	79·6	79·3	79·0	78·6	80·0
May	81·3	81·0	80·8	80·7	80·6	80·8	81·6	82·5	83·1	83·4	83·7	84·0	84·3	84·0	83·9	83·9	83·7	83·7	83·3	82·9	82·5	82·1	81·7	81·5	81·4	82·5
June	83·5	83·3	83·1	82·9	82·8	83·3	83·9	84·7	85·3	85·7	86·1	86·5	87·1	87·1	87·2	87·4	86·9	86·6	86·3	85·5	85·0	84·6	84·0	83·6	83·5	85·1
July	83·4	83·3	83·1	82·8	82·8	83·0	83·8	84·5	85·0	85·5	86·1	86·6	87·0	87·2	87·3	87·4	86·9	86·8	86·2	85·7	85·3	84·7	84·2	83·8	83·6	85·1
Aug.	85·0	84·6	84·6	84·3	84·1	84·2	84·8	85·6	86·3	87·1	87·8	88·4	88·6	88·6	88·6	88·6	88·3	88·2	87·7	87·2	86·3	85·8	85·3	84·9	84·7	86·5
Sept.	82·9	82·8	82·6	82·4	82·4	82·3	82·3	82·7	83·5	84·5	85·4	85·9	86·2	86·6	86·7	86·7	86·1	85·5	85·0	84·5	84·1	83·8	83·5	83·3	83·0	84·2
Oct.	80·1	80·2	79·9	79·8	79·6	79·6	79·7	79·9	80·4	80·9	81·5	81·9	82·3	82·4	82·1	82·0	81·6	81·3	80·8	80·5	80·3	80·3	80·1	80·0	79·9	80·7
Nov.	75·0	74·9	75·1	75·0	74·9	75·0	74·9	74·8	74·6	74·9	75·5	75·9	76·2	76·5	76·5	76·3	75·8	75·6	75·3	75·2	75·2	75·2	75·1	75·0	75·0	75·4
Dec.	76·7	76·7	76·8	76·8	76·7	76·6	76·4	76·5	76·4	76·5	76·5	76·8	77·2	77·4	77·4	77·3	77·0	77·0	76·7	76·6	76·6	76·6	76·5	76·5	76·6	76·8
Year	79·3	79·1	79·0	78·9	78·8	78·9	79·1	79·5	79·9	80·4	80·9	81·4	81·7	81·9	81·9	81·9	81·5	81·3	80·9	80·5	80·2	79·9	79·7	79·4	79·3	80·3

Eskdalemuir : Louvred Hut : h*t* = 0·9 m. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	a	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*
Jan.	74·0	74·0	74·0	74·0	74·1	74·2	74·2	74·3	74·4	74·5	74·8	75·2	75·6	75·9	75·8	75·6	75·1	74·8	74·7	74·5	74·4	74·4	74·4	74·4	74·2	74·7
Feb.	72·4	72·3	72·2	72·1	71·9	71·8	71·5	71·4	71·6	72·3	73·3	74·2	74·8	75·2	75·4	75·3	74·8	74·1	73·5	73·1	72·7	72·5	72·3	72·3	72·2	73·0
Mar.	71·8	71·5	71·3	71·3	71·3	71·3	71·4	71·5	72·5	73·4	74·5	75·3	75·6	76·0	75·9	75·9	75·6	75·2	74·4	73·8	73·3	72·7	72·2	72·0	71·9	73·3
April	76·0	75·9	75·8	75·7	75·7	75·6	75·9	76·4	77·5	78·2	79·0	79·6	80·2	80·8	80·8	80·9	80·8	80·1	79·6	78·5	77·7	77·4	77·0	76·6	76·2	78·0
May	80·7	80·2	79·9	79·8	79·4	79·4	80·5	81·9	83·4	84·8	85·9	86·8	87·6	88·0	88·3	88·0	87·6	87·1	86·4	85·3	83·7	82·4	81·7	81·1	80·8	83·8
June	81·6	81·3	81·0	80·7	80·6	81·1	82·1	83·2	84·2	85·2	85·9	86·3	86·7	87·1	87·2	86·8	86·4	85·9	85·4	84·7	83·8	83·0	82·4	81·8	81·5	83·9
July	81·6	81·0	80·6	80·4	80·4	80·9	82·0	83·3	84·6	85·6	86·5	87·2	88·0	88·4	88·6	88·6	88·7	88·3	87·8	86·7	85·3	83·9	82·8	82·1	81·7	84·7
Aug.	83·1	82·8	82·7	82·6	82·5	82·4	82·8	83·8	84·8	85·8	86·6	87·4	88·1	88·6	88·7	88·7	88·4	88·0	87·1	86·0	84·9	84·0	83·5	83·3	82·9	85·3
Sept.	81·3	81·2	81·2	81·0	81·0	80·9	81·0	81·6	82·7	83·8	84·5	84·9	85·4	85·6	85·6	85·4	85·2	84·7	83·5	82·6	82·2	81·9	81·7	81·7	81·2	82·9
Oct.	78·0	77·9	77·8	77·9	77·9	77·8	77·7	77·9	78·6	79·7	80·8	81·4	81·8	82·0	82·0	81·8	81·0	80·2	79·5	79·1	78·9	78·6	78·4	78·1	78·0	79·4
Nov.	73·7	73·7	73·7	73·6	73·6	73·4	73·3	73·4	73·5	74·0	74·5	75·1	75·6	75·7	75·7	75·4	74·9	74·5	74·3	74·1	74·2	74·0	74·0	73·9	73·7	74·2
Dec.	75·5	75·8	75·8	75·6	75·6	75·8	75·7	75·6	75·4	75·3	75·8	76·2	76·4	76·7	76·8	76·4	76·1	75·9	75·7	75·7	75·6	75·3	75·4	75·3	75·3	75·8
Year	77·5	77·3	77·2	77·1	77·0	77·1	77·3	77·9	78·6	79·4	80·2	80·8	81·3	81·7	81·7	81·6	81·2	80·7	80·2	79·5	78·9	78·4	78·0	77·7	77·5	79·1

Cahirciveen (Valencia Obs.) : North Wall Screen : h*t* = 1·3 m. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	a	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*
Jan.	79·3	79·1	78·9	78·9	78·8	78·8	78·8	78·8	78·9	78·9	79·2	79·4	79·9	80·1	80·2	80·1	79·9	79·8	79·5	79·4	79·4	79·4	79·4	79·3	79·1	79·3
Feb.	78·9	78·8	78·7	78·7	78·6	78·7	78·6	78·6	78·7	78·8	79·4	80·0	80·4	80·5	80·7	80·7	80·6	80·3	80·0	79·8	79·6	79·5	79·4	79·3	79·0	79·5
Mar.	77·9	77·8	77·7	77·5	77·3	77·4	77·4	77·3	77·6	78·1	78·9	79·6	79·8	80·2	80·2	80·2	80·2	79·9	79·4	79·0	78·6	78·4	78·2	77·9	77·9	78·6
April	80·5	80·5	80·5	80·3	80·2	80·1	80·2	80·5	81·4	81·9	82·1	82·6	82·8	83·2	83·0	83·1	83·0	82·6	82·2	81·5	81·1	81·0	80·8	80·8	80·8	81·5
May	84·2	84·0	83·8	83·8	83·7	83·5	83·7	84·6	85·4	86·0	86·3	86·6	86·9	87·4	87·6	87·6	87·4	87·1	86·5	86·0	85·4	85·0	84·8	84·5	84·3	85·5
June	85·2	84·9	84·8	84·5	84·5	84·4	84·8	85·6	86·2	86·9	87·2	87·4	87·6	88·0	87·9	87·9	88·1	87·9	87·4	86·8	86·2	85·9	85·5	85·3	85·1	86·3
July	85·7	85·5	85·3	85·1	85·1	85·1	85·5	86·3	87·0	87·5	88·0	88·4	88·6	88·9	89·0	89·0	89·0	88·9	88·3	87·8	87·2	86·7	86·2	86·1	85·8	87·1
Aug.	87·5	87·4	87·3	87·2	87·1	87·2	87·1	87·4	88·4	89·3	89·8	90·1	90·4	90·5	90·9	90·6	90·5	90·2	89·3	89·1	88·5	88·1	87·8	87·6	87·5	88·7
Sept.	85·4	85·2	85·1	85·1	85·1	85·0	85·1	85·1	85·8	86·5	87·1	87·5	87·9	88·2	88·2	88·1	87·8	87·4	87·0	86·6	86·2	85·9	85·8	85·5	85·3	86·3
Oct.	83·3	83·1	82·9	82·9	82·9	83·0	82·9	82·9	83·0	83·4	84·2	84·8	85·1	85·3	85·3	85·2	85·0	84·5	84·0	83·9	83·7	83·6	83·4	83·1	83·1	83·8
Nov.	77·4	77·5	77·5	77·5	77·4	77·3	77·3	77·2	77·3	77·6	78·3	79·2	79·6	80·0	80·1	80·0	79·6	79·0	78·7	78·2	77·9	77·7	77·5	77·4	77·4	78·2
Dec.	81·1	81·1	81·2	81·3	81·4	81·2	81·1	81·0	81·1	81·2	81·4	81·9	82·1	82·1	82·1	81·9	81·7	81·5	81·4	81·4	81·2	81·1	81·0	80·9	81·1	81·4
Year	82·2	82·1	82·0	81·9	81·8	81·8	81·9	82·1	82·6	83·0	83·5	84·0	84·3	84·5	84·6	84·5	84·4	84·1	83·6	83·3	82·9	82·7	82·5	82·3	82·2	83·0

Richmond (Kew Obs.) : North Wall Screen : h*t* = 3·0 m. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	a	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*
Jan.	76·1	75·9	75·8	75·7	75·6	75·6	75·6	75·6	75·7	76·0	76·4	77·0	77·5	77·9	78·0	77·9	77·4	77·2	76·9	76·6	76·4	76·4	76·3	76·1	76·0	76·5
Feb.	74·9	74·7	74·6	74·6	74·4	74·4	74·4	74·5	74·5	74·8	75·4	76·1	76·6	77·0	77·4	77·3	77·0	76·6	76·2	76·0	75·8	75·5	75·4	75·3	75·1	75·6
Mar.	76·9	76·8	76·5	76·5	76·4	76·4	76·3	76·5	77·1	77·7	78·5	79·1	79·6	79·8	79·8	79·9	79·6	79·2	78·5	78·1	77·6	77·3	77·1	77·0	76·8	77·8
April	79·2	79·0	78·6	78·2	78·0	77·9	77·9	78·7	79·7	80·7	81·5	82·1	82·7	83·2	83·3	83·4	83·3	83·4	82·9	82·1	81·3	80·6	80·0	79·7	79·4	80·7
May	84·2	83·6	83·2	82·8	82·6	82·6	83·4	84·8	86·2	87·4	88·6	89·4	90·4	90·9	91·4	91·6	91·5	91·2	90·4	89·0	87·4	86·4	85·5	85·0	84·4	87·1
June	85·9	85·3	84·8	84·3	84·1	84·7	85·5	86·6	87·8	88·7	89·5	90·3	90·8	91·6	92·1	92·3	92·6	92·5	92·1	91·1	89·5	88·1	87·2	86·3	85·8	88·5
July	85·9	85·3	85·1	84·9	84·8	84·8	85·1	85·6	86·4	87·0	88·0	88·6	89·1	89·6	90·1	90·4	90·5	90·2	90·1	89·5	88·4	87·5	87·1	86·5	86·1	87·5
Aug.	88·3	87·9	87·4	87·0	86·7	86·6	87·1	87·9	89·0	90·2	91·4	92·6	93·4	93·9	94·3	94·6	94·8	94·4	93·7	92·6	91·1	90·1	89·4	88·6	88·1	90·5
Sept.	85·1	84·7	84·4	84·1	83·8	83·6	83·5	84·0	85·2	86·6	87·9	89·1	89·9	90·5	90·8	90·8	90·7	90·4	89·3	88·0	87·1	86·4	85·8	85·4	85·0	87·0
Oct.	78·3	77·9	77·7	77·6	77·5	77·5	77·5	77·6	78·3	79·7	81·0	82·2	83·5	84·1	84·4	84·3	83·9	83·0	81·6	80·8	80·1	79·7	79·0	78·5	78·1	80·2
Nov.	76·6	76·5	76·4	76·2	76·1	76·0	76·0	75·8	75·9	76·5	77·0	77·6	78·2	78·6	78·5	78·4	78·1	77·7	77·4	77·2	77·1	77·0	76·8	76·7	76·7	77·0
Dec.	78·7	78·7	78·7	78·7	78·8	78·7	78·7	78·7	78·8	78·9	79·2	79·8	80·2	80·6	80·7	80·5	80·1	79·7	79·4	79·3	79·2	79·0	78·8	78·6	78·6	79·3
Year	80·8	80·5	80·3	80·0	79·9	80·1	79·9	80·5	81·2	82·0	82·9	83·7	84·4	84·8	85·1	85·1	85·0	84·6	84·0	83·3	82·6	82·0	81·5	81·2	80·9	82·3

**Note.*—The initial 2 of the readings is omitted, i.e., 275·0 degrees absolute is written 75·0.

DIURNAL INEQUALITIES OF TEMPERATURE.

Departures from the Mean of the day adjusted for non-periodic change.

Aberdeen : Unit = 1° centrigade. **1919.**

G.M.T.	Midt.	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Jan.	−0·3	−0·3	−0·5	−0·6	−0·5	−0·6	−0·6	−0·6	−0·4	−0·3	+0·1	+0·7	+0·4	+0·8	+0·9	+0·8	+0·6	+0·4	+0·3	+0·1	0·0	−0·1	−0·2	−0·2	−0·3
Feb.	−0·4	−0·6	−0·7	−0·9	−1·0	−1·1	−1·1	−1·3	−1·2	−0·9	−0·2	+0·4	+1·0	+1·4	+1·6	+1·5	+1·3	+1·0	+0·7	+0·4	+0·2	0·0	0·0	−0·3	−0·4
Mar.	−0·9	−1·0	−1·2	−1·3	−1·3	−1·4	−1·4	−1·3	−0·7	0·0	+0·7	+1·2	+1·4	+1·7	+1·7	+1·7	+1·4	+1·2	+0·8	+0·3	0·0	−0·3	−0·5	−0·7	−0·9
Apr.	−1·4	−1·7	−1·9	−2:0	−2·1	−2·1	−1·9	−1·1	−0·5	+0·5	+1·0	+1·5	+1·9	+2·1	+2·3	+2·1	+2·0	+1·7	+1·2	+0·6	0·0	−0·5	−0·7	−1·0	−1·4
May	−1·2	−1·5	−1·7	−1·7	−1·9	−1·7	−0·9	−0·1	+0·5	+0·9	+1·2	+1·5	+1·7	+1·5	+1·4	+1·3	+1·2	+1·2	+0·7	+0·3	−0·1	−0·5	−0·9	−1·1	−1·2
June	−1·6	−1·8	−2·0	−2·2	−2·3	−1·8	−1·2	−0·4	+0·2	+0·6	+1·0	+1·4	+2·0	+2·0	+2·1	+2·3	+1·8	+1·5	+1·2	+0·4	−0·1	−0·5	−1·1	−1·5	−1·6
July	−1·6	−1·7	−2·0	−2·2	−2·3	−2·0	−1·3	−0·5	−0·1	+0·4	+1·0	+1·5	+1·9	+2·1	+2·2	+2·3	+1·8	+1·6	+1·1	+0·6	+0·1	−0·5	−1·0	−1·3	−1·6
Aug.	−1·6	−1·9	−2·0	−2·2	−2·4	−2·3	−1·7	−0·9	−0·2	+0·7	+1·3	+1·9	+2·1	+2·1	+2·2	+2·2	+1·9	+1·8	+1·3	+0·8	0·0	−0·5	−1·0	−1·5	−1·6
Sept.	−1·3	−1·4	−1·6	−1·8	−1·8	−1·9	−1·9	−1·5	−0·7	+0·3	+1·2	+1·7	+2·0	+2·3	+2·4	+2·4	+1·9	+1·2	+0·7	+0·3	−0·2	−0·5	−0·8	−1·0	−1·3
Oct.	−0·7	−0·7	−0·9	−1·0	−1·2	−1·1	−1·1	−0·8	−0·4	+0·2	+0·8	+1·2	+1·5	+1·7	+1·4	+1·3	+0·9	+0·6	+0·1	−0·1	−0·3	−0·4	−0·5	−0·6	−0·7
Nov.	−0·3	−0·5	−0·2	−0·3	−0·4	−0·4	−0·4	−0·6	−0·7	−0·4	+0·1	+0·5	+0·9	+1·1	+1·1	+1·0	+0·5	+0·2	0·0	−0·1	−0·1	−0·1	−0·2	−0·4	−0·3
Dec.	−0·1	−0·1	0·0	0·0	−0·1	−0·2	−0·4	−0·3	−0·4	−0·3	−0·3	+0·1	+0·4	+0·7	+0·7	+0·5	+0·3	+0·3	0·0	−0·1	−0·1	−0·1	−0·2	−0·2	−0·1
Year	−0·9	−1·1	−1·2	−1·4	−1·5	−1·4	−1·2	−0·8	−0·4	+0·1	+0·7	+1·1	+1·4	+1·6	+1·7	+1·6	+1·3	+1·1	+0·7	+0·3	−0·1	−0·3	−0·6	−0·8	−0·9

Eskdalemuir : **1919.**

G.M.T.	Midt.	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Jan.	−0·5	−0·6	−0·6	−0·6	−0·5	−0·4	−0·4	−0·3	−0·2	−0·1	+0·2	+0·6	+0·9	+1·3	+1·1	+0·9	+0·5	+0·1	0·0	−0·2	−0·3	−0·3	−0·3	−0·4	−0·5
Feb.	−0·7	−0·8	−0·9	−1·0	−1·1	−1·3	−1·5	−1·7	−1·5	−0·8	+0·3	+1·1	+1·8	+2·2	+2·4	+2·3	+1·8	+1·1	+0·5	+0·1	−0·3	−0·5	−0·7	−0·7	−0·7
Mar.	−1·5	−1·8	−1·9	−1·9	−2·0	−2·0	−1·9	−1·8	−0·9	+0·1	+1·2	+2·0	+2·3	+2·6	+2·6	+2·6	+2·3	+1·9	+1·0	+0·4	−0·1	−0·6	−1·2	−1·3	−1·5
Apr.	−1·9	−2·0	−2·1	−2·3	−2·3	−2·3	−2·1	−1·5	−0·5	+0·2	+1·0	+1·6	+2·2	+2·8	+2·8	+2·9	+2·7	+2·1	+1·5	+0·5	−0·3	−0·6	−1·1	−1·5	−1·9
May	−3·0	−3·5	−3·8	−3·9	−4·3	−4·3	−3·3	−1·8	−0·4	+1·0	+2·2	+3·0	+3·9	+4·3	+4·6	+4·3	+3·8	+3·3	+2·6	+1·5	−0·1	−1·3	−2·1	−2·7	−3·0
June	−2·4	−2·7	−3·0	−3·3	−3·4	−2·9	−1·8	−0·7	+0·3	+1·3	+2·0	+2·4	+2·8	+3·1	+3·3	+2·9	+2·5	+2·0	+1·4	+0·8	−0·1	−0·9	−1·5	−2·1	−2·4
July	−3·1	−3·6	−4·0	−4·3	−4·3	−3·7	−2·7	−1·4	−0·1	+0·9	+1·7	+2·5	+3·3	+3·7	+3·9	+3·9	+4·0	+3·6	+3·1	+1·9	+0·5	−0·9	−2·0	−2·7	−3·1
Aug.	−2·2	−2·6	−2·7	−2·8	−2·8	−2·9	−2·5	−1·5	−0·5	+0·5	+1·3	+2·1	+2·8	+3·3	+3·4	+3·4	+3·2	+2·7	+1·9	+0·8	−0·3	−1·1	−1·7	−1·9	−2·2
Sept.	−1·7	−1·8	−1·8	−1·9	−1·9	−2·0	−1·9	−1·3	−0·3	+0·8	+1·6	+1·9	+2·4	+2·7	+2·7	+2·5	+2·3	+1·8	+0·6	−0·3	−0·7	−1·1	−1·2	−1·3	−1·7
Oct.	−1·4	−1·5	−1·6	−1·5	−1·5	−1·6	−1·7	−1·5	−0·7	+0·4	+1·4	+2·0	+2·4	+2·7	+2·7	+2·5	+1·7	+0·9	+0·1	−0·2	−0·5	−0·8	−0·9	−1·2	−1·4
Nov.	−0·6	−0·5	−0·5	−0·7	−0·7	−0·8	−0·9	−0·8	−0·7	−0·2	+0·3	+0·9	+1·3	+1·5	+1·4	+1·1	+0·6	+0·2	+0·1	−0·1	−0·1	−0·2	−0·3	−0·4	−0·6
Dec.	−0·4	−0·1	−0·1	−0·3	−0·2	−0·1	−0·1	−0·2	−0·4	−0·5	0·0	+0·4	+0·6	+0·9	+1·0	+0·7	+0·4	+0·1	0·0	−0·1	−0·2	−0·5	−0·3	−0·5	−0·4
Year	−1·6	−1·8	−1·9	−2·0	−2·1	−2·0	−1·7	−1·2	−0·5	+0·3	+1·1	+1·7	+2·2	+2·6	+2·7	+2·5	+2·1	+1·7	+1·1	+0·4	−0·2	−0·7	−1·1	−1·4	−1·6

Cahirciveen (Valencia Obs.) **1919.**

G.M.T.	Midt.	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Jan.	−0·1	−0·3	−0·5	−0·5	−0·6	−0·6	−0·6	−0·5	−0·4	−0·5	−0·2	+0·1	+0·5	+0·7	+0·9	+0·8	+0·6	+0·5	+0·2	+0·1	+0·1	+0·1	+0·1	0·0	−0·1
Feb.	−0·5	−0·6	−0·7	−0·8	−0·8	−0·7	−0·9	−0·8	−0·8	−0·7	−0·1	+0·6	+1·0	+1·1	+1·2	+1·2	+1·1	+0·8	+0·5	+0·3	+0·1	0·0	−0·1	−0·3	−0·5
Mar.	−0·7	−0·8	−0·9	−1·1	−1·3	−1·3	−1·2	−1·3	−1·0	−0·5	+0·3	+1·0	+1·2	+1·6	+1·6	+1·6	+1·6	+1·3	+0·8	+0·4	+0·1	−0·2	−0·4	−0·6	−0·7
Apr.	−0·8	−0·9	−1·0	−1·1	−1·3	−1·3	−1·3	−0·9	−0·1	+0·4	+0·6	+1·1	+1·3	+1·7	+1·5	+1·6	+1·5	+1·1	+0·7	0·0	−0·5	−0·5	−0·8	−0·8	−0·8
May	−1·3	−1·5	−1·6	−1·6	−1·8	−1·9	−1·7	−0·9	−0·1	+0·5	+0·8	+1·2	+1·4	+1·9	+2·1	+2·1	+1·9	+1·6	+1·0	+0·5	−0·1	−0·5	−0·8	−1·0	−1·3
June	−1·2	−1·4	−1·5	−1·8	−1·8	−1·9	−1·5	−0·7	−0·1	+0·6	+0·9	+1·1	+1·3	+1·7	+1·7	+1·6	+1·8	+1·6	+1·1	+0·5	0·0	−0·3	−0·7	−0·9	−1·2
July	−1·3	−1·6	−1·8	−1·9	−2·0	−1·9	−1·6	−0·8	−0·1	+0·4	+0·9	+1·3	+1·6	+1·8	+1·9	+1·9	+1·9	+1·8	+1·2	+0·7	+0·1	−0·4	−0·9	−1·1	−1·3
Aug.	−1·3	−1·3	−1·4	−1·5	−1·6	−1·5	−1·6	−1·3	−0·3	+0·6	+1·1	+1·4	+1·6	+1·8	+2·2	+1·8	+1·8	+1·5	+0·6	+0·3	−0·2	−0·6	−1·0	−1·1	−1·3
Sept.	−1·0	−1·2	−1·3	−1·3	−1·3	−1·3	−1·3	−1·2	−0·5	+0·2	+0·7	+1·2	+1·6	+1·8	+1·9	+1·7	+1·5	+1·1	+0·7	+0·2	−0·2	−0·4	−0·5	−0·8	−1·0
Oct.	−0·6	−0·8	−1·0	−1·0	−1·0	−0·9	−1·0	−0·9	−0·8	−0·5	+0·4	+1·0	+1·3	+1·5	+1·5	+1·4	+1·2	+0·8	+0·3	+0·1	0·0	−0·1	−0·3	−0·6	−0·6
Nov.	−0·8	−0·7	−0·7	−0·7	−0·8	−0·9	−0·9	−1·0	−0·9	−0·6	+0·1	+1·0	+1·4	+1·8	+1·9	+1·8	+1·4	+0·8	+0·5	0·0	−0·4	−0·5	−0·7	−0·8	−0·8
Dec.	−0·3	−0·3	−0·3	−0·1	−0·1	−0·2	−0·3	−0·4	−0·3	−0·2	0·0	+0·5	+0·7	+0·7	+0·8	+0·5	+0·3	+0·1	0·0	0·0	−0·1	−0·3	−0·3	−0·5	−0·3
Year	−0·8	−0·9	−1·1	−1·1	−1·2	−1·2	−1·2	−0·9	−0·5	0·0	+0·5	+0·9	+1·2	+1·5	+1·6	+1·5	+1·4	+1·1	+0·6	+0·3	−0·1	−0·3	−0·5	−0·7	−0·8

Richmond (Kew Obs.) **1919.**

G.M.T	Midt.	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Jan.	−0·4	−0·6	−0·7	−0·8	−1·0	−0·9	−0·9	−0·9	−0·8	−0·5	−0·1	+0·5	+1·0	+1·4	+1·5	+1·4	+1·0	+0·7	+0·4	+0·1	0·0	−0·1	−0·1	−0·3	−0·4
Feb.	−0·6	−0·8	−0·9	−0·9	−1·1	−1·1	−1·1	−1·1	−1·1	−0·7	−0·2	+0·5	+1·1	+1·5	+1·8	+1·7	+1·5	+1·0	+0·6	+0·3	+0·2	−0·1	−0·3	−0·3	−0·6
Mar.	−1·0	−1·1	−1·4	−1·4	−1·4	−1·5	−1·6	−1·3	−0·8	−0·2	+0·6	+1·2	+1·7	+2·0	+2·0	+2·1	+1·8	+1·4	+0·7	+0·3	−0·2	−0·5	−0·6	−0·8	−1·0
Apr.	−1·4	−1·6	−2·0	−2·4	−2·6	−2·8	−2·7	−2·0	−1·0	0·0	+0·8	+1·4	+2·0	+2·5	+2·5	+2·6	+2·5	+2·6	+2·1	+1·3	+0·5	−0·2	−0·8	−1·2	−1·4
May	−2·8	−3·4	−3·8	−4·2	−4·4	−4·5	−3·6	−2·3	−0·8	+0·4	+1·6	+2·4	+3·3	+3·8	+4·3	+4·5	+4·4	+4·1	+3·3	+1·9	+0·3	−0·7	−1·6	−2·1	−2·8
June	−2·6	−3·2	−3·7	−4·2	−4·4	−3·9	−3·0	−1·9	−0·7	+0·3	+1·0	+1·8	+2·3	+3·1	+3·6	+3·9	+4·1	+4·0	+3·6	+2·7	+1·1	−0·3	−1·3	−2·1	−2·6
July	−1·5	−2·1	−2·3	−2·6	−2·7	−2·7	−2·4	−1·9	−1·1	−0·5	+0·5	+1·1	+1·6	+2·1	+2·5	+2·8	+2·9	+2·7	+2·5	+1·9	+0·8	0·0	−0·5	−1·1	−1·5
Aug.	−2·4	−2·8	−3·2	−3·6	−3·9	−4·0	−3·5	−2·7	−1·5	−0·4	+0·9	+2·0	+2·8	+3·3	+3·8	+4·0	+4·2	+3·9	+3·2	+2·1	+0·7	−0·3	−1·0	−1·8	−2·4
Sept.	−1·9	−2·3	−2·6	−2·9	−3·2	−3·4	−3·5	−3·0	−1·8	−0·4	+0·9	+2·2	+2·9	+3·5	+3·8	+3·8	+3·7	+3·4	+2·3	+1·1	+0·1	−0·5	−1·1	−1·5	−1·9
Oct.	−2·0	−2·4	−2·6	−2·7	−2·8	−2·8	−2·8	−2·7	−1·9	−0·6	+0·7	+2·0	+3·3	+3·9	+4·1	+4·1	+3·7	+2·8	+1·5	+0·6	−0·1	−0·5	−1·2	−1·7	−2·0
Nov.	−0·4	−0·5	−0·6	−0·7	−0·9	−1·0	−1·0	−1·2	−1·1	−0·5	0·0	+0·6	+1·2	+1·5	+1·5	+1·3	+1·1	+0·6	+0·3	+0·1	0·0	−0·1	−0·3	−0·3	−0·4
Dec.	−0·6	−0·7	−0·6	−0·6	−0·5	−0·6	−0·6	−0·6	−0·5	−0·3	0·0	+0·5	+0·9	+1·3	+1·4	+1·3	+0·9	+0·5	+0·2	+0·1	0·0	−0·2	−0·4	−0·5	−0·6
Year	−1·5	−1·8	−2·0	−2·3	−2·4	−2·4	−2·2	−1·8	−1·1	−0·3	+0·6	+1·3	+2·0	+2·5	+2·8	+2·8	+2·7	+2·3	+1·7	+1·0	+0·3	−0·3	−0·8	−1·1	−1·5

Note—The entry for the hour n is X_n where $X_n = t_n - \bar{t} - (n-12)\ (t_{24} - t_0)/24$, t_n being the temperature at hour n and $\bar{t}$ the mean for 24 hours.

HOURLY VALUES FROM AUTOGRAPHIC RECORDS.

RELATIVE HUMIDITY: MONTHLY MEANS OF HOURLY VALUES.

Percentages, deduced from thermometer readings at exact hours, Greenwich Mean Time, by Glaisher's method.

Aberdeen: North Wall Screen on Tower: h*t* (height of thermometer bulb above the ground) = 12·5 metres. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Jan.	86	86	86	87	87	87	87	87	89	89	87	82	89	84	84	84	84	85	84	86	86	86	86	86	86	86
Feb.	84	85	85	83	83	85	83	85	85	83	80	81	78	77	76	77	79	79	81	82	82	82	82	84	79	80
Mar.	80	80	80	79	77	79	79	79	80	79	73	73	75	72	72	71	73	74	76	78	78	77	77	80	80	78
April	80	83	82	82	82	82	83	80	78	74	73	71	69	69	68	67	67	68	70	72	76	77	78	80	80	75
May	86	86	86	85	86	86	84	81	78	77	76	75	75	77	78	78	78	77	79	81	82	84	86	86	86	81
June	79	81	80	80	81	80	78	75	73	71	69	67	64	63	64	63	66	67	69	72	74	75	77	78	79	73
July	84	84	85	84	84	85	81	79	78	76	73	72	70	70	70	70	71	71	73	75	77	79	82	82	84	77
Aug.	76	78	78	79	81	79	77	75	72	69	67	64	65	65	64	65	66	67	68	70	73	75	76	76	76	71
Sept.	81	82	83	84	83	84	84	84	82	79	74	72	71	69	68	69	71	74	77	78	79	80	81	81	81	77
Oct.	84	84	85	85	86	86	85	85	84	82	78	77	76	75	76	77	78	79	80	82	82	82	84	84	85	81
Nov.	84	82	82	82	82	80	82	84	85	84	82	82	82	80	80	80	82	84	84	85	85	85	84	82	84	84
Dec.	83	84	84	84	86	86	86	84	87	86	86	86	84	82	82	82	84	82	82	83	83	83	83	83	83	84
Year	83	83	83	83	84	84	83	82	81	79	75	75	74	72	72	72	75	75	76	79	80	83	82	82	82	79

Eskdalemuir: Louvred Hut: h*t* = 0·9 m. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Jan.	92	91	90	90	90	91	91	90	91	90	89	88	87	87	88	89	90	90	89	90	90	89	89	89	92	90
Feb.	89	88	88	89	89	88	89	89	86	85	82	79	77	78	77	77	80	83	84	86	86	85	87	87	89	85
Mar.	85	86	85	86	84	84	84	83	81	79	75	75	76	75	76	76	75	78	80	80	81	83	83	82	84	80
April	86	86	87	87	87	88	88	88	84	82	79	78	74	74	73	72	73	76	78	82	83	83	84	86	87	82
May	86	88	88	88	88	88	87	84	78	72	68	66	63	62	61	62	64	67	70	73	79	83	85	85	86	77
June	86	87	87	87	87	86	85	82	77	72	69	68	67	67	66	68	70	73	75	77	81	83	84	85	85	78
July	86	88	89	90	90	90	89	85	80	76	73	71	68	67	67	67	66	68	68	73	77	80	84	86	87	78
Aug.	87	88	88	87	88	88	88	85	82	78	74	72	69	67	68	68	68	70	72	76	78	81	83	85	87	79
Sept.	89	90	89	89	89	90	89	87	86	83	78	78	74	73	73	74	76	76	81	85	85	86	87	88	89	83
Oct.	86	86	87	88	86	86	86	87	85	83	79	76	75	74	74	75	78	81	81	83	83	84	85	86	86	82
Nov.	89	90	89	90	90	91	91	91	90	89	87	86	84	84	84	85	88	89	89	88	88	89	90	89	89	88
Dec.	89	89	90	89	89	90	90	90	89	90	89	88	87	88	88	88	87	88	88	90	88	89	89	88	89	89
Year	87	88	88	88	88	88	88	87	84	82	78	77	75	75	74	75	76	78	80	82	83	85	86	86	87	82

Cahirciveen (Valencia Obs.): North Wall Screen: h*t* = 1·3 m. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Jan.	87	87	87	86	86	86	87	87	87	87	87	87	86	85	84	83	83	83	84	85	85	85	85	85	86	86
Feb.	82	83	83	83	82	83	82	82	82	82	81	80	80	79	79	79	79	79	79	80	80	80	81	81	83	81
Mar.	85	86	86	87	87	85	86	85	85	83	81	78	77	76	76	76	75	78	81	82	84	84	85	86	85	82
April	85	86	85	87	87	87	86	85	82	80	79	77	76	75	76	76	77	78	80	83	85	85	86	86	86	82
May	87	87	88	87	87	88	87	86	83	82	82	81	80	79	78	79	78	80	82	83	86	86	87	87	87	84
June	85	86	87	88	88	88	88	85	84	83	81	79	79	78	78	77	76	78	80	82	83	84	86	85	85	83
July	90	91	92	92	92	92	92	89	87	85	82	81	81	80	79	80	79	80	81	84	86	88	90	90	90	86
Aug.	89	90	89	90	90	90	90	91	88	85	82	81	79	78	79	79	78	79	82	84	86	87	89	89	89	85
Sept.	87	88	88	88	87	88	88	88	86	84	81	80	78	77	76	77	78	80	82	83	85	87	87	88	87	84
Oct.	85	86	87	87	86	86	87	86	86	85	84	81	79	78	77	77	78	79	82	81	83	83	84	86	85	83
Nov.	82	81	81	80	80	80	81	82	81	83	83	80	79	78	78	78	79	81	81	83	82	82	81	81	82	81
Dec.	85	85	86	86	86	87	85	87	87	87	87	86	86	86	85	85	85	85	85	85	85	84	85	85	86	86
Year	86	86	86	87	87	86	87	86	85	84	83	81	80	79	79	79	79	80	82	83	84	85	86	86	86	83

Richmond (Kew Obs.): North Wall Screen: h*t* = 3·0 m. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Jan.	88	89	89	90	90	89	89	90	89	89	88	86	84	82	81	82	84	85	86	87	87	88	88	87	87	87
Feb.	84	85	84	85	86	85	86	87	86	84	81	78	77	76	75	76	76	78	80	80	81	83	83	84	85	82
Mar.	82	83	84	85	86	86	86	84	83	81	77	73	71	70	70	70	71	73	77	79	80	82	81	82	82	79
April	82	82	83	84	85	86	85	82	79	76	72	70	69	68	67	67	66	65	68	71	74	77	80	81	82	76
May	80	83	84	86	87	87	85	81	74	70	65	62	59	57	56	54	53	54	57	60	65	70	75	77	80	70
June	76	78	81	82	83	80	78	73	68	65	61	59	57	55	53	52	52	53	53	56	60	67	71	73	76	66
July	82	84	85	86	86	86	84	81	77	76	71	69	68	65	64	64	64	67	67	70	74	78	79	81	82	75
Aug.	82	83	84	85	86	86	84	82	76	72	66	61	57	57	56	55	54	56	60	64	69	74	77	81	83	71
Sept.	88	88	88	89	90	89	89	88	84	80	74	68	66	64	62	63	63	65	71	76	80	84	85	87	87	78
Oct.	90	90	90	90	90	91	91	91	89	84	78	75	70	70	67	68	70	74	80	83	85	85	88	89	90	82
Nov.	90	90	90	90	89	90	90	91	91	87	86	84	81	80	79	80	81	82	84	86	86	87	88	89	90	86
Dec.	87	88	88	89	89	88	88	88	89	89	87	85	85	82	81	82	84	85	87	87	88	87	86	87	87	86
Year	84	85	86	87	87	87	86	85	82	80	76	73	70	69	68	68	68	70	72	75	77	80	82	83	84	78

WIND SPEED: MONTHLY MEANS OF HOURLY VALUES.

Averages, in metres per second, for periods of sixty minutes centred at the exact hours, Greenwich Mean Time.

Aberdeen : H*a* (height of anemometer above M.S.L.) = 37 metres. h*a* (height of anemometer above ground) = 23 metres. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	ms/	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s
Jan.	4·2	4·3	4·4	4·2	4·0	3·8	4·2	4·4	4·0	4·1	4·6	4·1	4·2	4·2	4·4	4·4	4·6	4·5	4·6	4·4	4·2	4·2	4·5	4·4	4·3	4·3
Feb.	3·2	3·4	3·3	3·1	3·2	3·1	3·0	2·9	2·9	3·2	3·2	3·3	3·3	3·4	3·8	3·3	3·3	3·4	3·4	3·2	3·4	3·3	3·3	3·2	3·3	3·3
Mar.	4·5	4·2	4·5	4·7	4·9	5·1	5·4	5·0	5·2	5·8	5·7	6·0	6·2	6·3	6·1	6·1	5·8	5·6	5·1	4·9	4·5	4·6	4·7	4·6	4·5	5·3
April	2·9	2·7	2·8	2·9	3·0	3·3	3·5	4·0	4·4	4·8	4·9	5·0	5·1	4·7	5·1	5·4	5·3	4·3	4·0	3·6	3·1	2·8	3·1	3·2	2·8	3·9
May	2·3	2·3	2·4	2·5	2·2	2·2	2·4	2·8	3·2	3·6	3·7	4·2	4·2	4·2	4·1	4·0	3·9	3·5	3·4	3·1	2·8	2·4	2·2	2·2	2·2	3·1
June	3·3	3·2	3·2	3·4	3·5	3·4	3·9	4·3	4·7	5·2	5·5	5·8	6·0	5·3	5·4	5·5	5·1	4·9	4·6	4·5	3·9	3·7	3·6	3·6	3·4	4·4
July	2·7	2·6	3·0	3·0	3·0	3·0	3·3	3·9	4·4	4·5	4·5	4·8	4·7	5·0	4·8	4·8	4·5	4·2	3·9	3·5	3·1	3·1	2·9	2·9	2·7	3·7
Aug.	3·2	3·4	3·2	3·2	3·1	3·0	3·2	3·6	4·1	4·6	4·7	4·8	4·8	4·9	4·6	4·7	4·4	4·4	4·0	3·6	3·1	3·0	3·2	3·1	3·1	3·8
Sept.	3·3	3·5	3·7	3·5	3·6	3·5	3·4	3·5	3·7	4·3	4·9	5·0	5·0	5·1	5·2	4·9	4·7	4·3	3·7	3·5	3·3	3·4	3·3	3·3	3·4	4·0
Oct.	3·7	4·1	3·8	3·6	3·6	3·7	3·8	4·1	4·7	5·0	5·5	5·7	5·5	5·2	5·3	4·7	4·1	3·8	3·8	3·8	3·7	3·7	3·6	3·5	3·6	4·2
Nov.	4·2	4·4	4·5	4·4	4·8	4·8	4·4	4·2	4·0	3·7	4·2	4·0	4·5	4·3	4·5	4·4	4·2	4·4	4·4	4·1	4·1	4·4	4·5	4·2	4·4	4·3
Dec.	5·0	5·1	5·3	5·0	5·0	4·8	4·6	4·3	4·1	4·3	4·1	4·3	4·4	4·4	4·5	4·0	4·0	4·4	4·6	4·8	4·7	4·8	4·8	5·0	5·0	4·6
Year	3·5	3·6	3·7	3·6	3·7	3·6	3·8	3·9	4·1	4·4	4·6	4·8	4·8	4·8	4·8	4·7	4·5	4·3	4·1	3·9	3·7	3·6	3·6	3·6	3·6	4·1

Eskdalemuir : H*a* = 250 m. h*a* = 15 m. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s
Jan.	4·5	4·2	4·3	4·2	4·2	4·6	4·8	4·8	4·7	4·6	4·8	4·9	5·3	5·4	5·4	4·9	4·7	4·5	4·5	4·5	4·3	4·4	4·4	4·7	4·7	4·7
Feb.	2·9	3·1	3·0	3·0	3·0	2·7	2·8	2·9	2·6	2·8	3·1	3·7	4·4	4·5	4·6	4·6	4·3	4·1	3·9	3·9	3·4	3·1	3·0	2·7	2·7	3·4
Mar.	4·5	4·3	4·6	4·7	4·6	4·8	4·8	5·5	5·5	5·9	6·5	6·8	7·1	7·2	7·1	6·8	6·6	6·0	4·6	4·2	4·2	4·2	3·6	4·2	4·5	5·3
April	4·0	3·7	3·7	3·6	3·8	4·2	4·3	5·0	6·3	6·8	6·7	7·1	7·1	7·0	7·0	7·7	7·8	7·1	7·0	5·6	5·4	5·0	4·6	4·1	4·1	5·6
May	2·1	2·2	2·3	2·1	2·1	2·2	2·3	2·8	3·8	4·5	5·1	5·2	5·3	5·6	6·0	6·3	6·3	5·7	4·9	4·2	3·6	3·0	3·0	2·8	2·1	3·9
June	4·4	4·8	4·7	4·5	4·4	4·3	4·8	5·9	6·8	7·1	7·1	7·0	7·1	7·4	8·0	7·9	8·0	7·4	6·9	6·4	5·7	5·0	4·6	4·7	4·6	6·1
July	2·7	2·4	2·3	2·5	2·5	2·7	3·1	3·4	4·2	4·9	5·0	5·2	5·4	5·2	5·3	5·5	5·6	5·2	5·0	4·2	3·6	3·5	3·2	2·8	2·7	4·0
Aug.	3·4	3·0	3·1	3·1	3·1	3·2	3·7	3·8	4·4	4·8	5·6	5·9	6·2	6·3	5·9	6·2	6·3	5·9	5·2	4·3	3·9	3·2	3·0	3·3	3·1	4·5
Sept.	4·3	4·7	5·1	5·1	5·0	4·9	5·0	4·9	5·4	6·4	7·1	7·3	7·2	7·1	7·1	7·0	6·9	6·8	5·7	5·6	5·1	5·0	4·9	5·0	4·4	5·8
Oct.	4·4	4·1	4·3	4·5	4·5	4·1	4·1	4·8	5·0	5·7	6·4	6·6	6·6	6·6	6·0	5·6	5·5	4·8	4·8	4·7	4·6	4·2	4·2	4·1	4·4	5·0
Nov.	4·9	5·0	5·2	5·0	5·0	4·7	4·7	4·8	4·9	5·3	5·5	5·7	6·0	5·8	5·2	4·7	4·5	4·7	4·8	4·7	4·4	4·5	5·1	5·2	5·1	5·0
Dec.	6·0	6·3	6·2	5·8	5·9	5·6	5·3	5·6	5·9	5·7	6·4	6·7	6·9	6·8	6·8	6·1	5·9	5·6	5·8	5·8	6·1	6·0	5·8	5·9	5·8	6·0
Year	4·0	4·0	4·1	4·0	4·0	4·0	4·1	4·5	5·0	5·4	5·8	6·0	6·2	6·2	6·2	6·1	6·0	5·7	5·3	4·8	4·5	4·3	4·1	4·1	4·0	4·9

Cahirciveen (Valencia Obs.) : H*a* = 26 m. h*a* = 14 m. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	ms/	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s
Jan.	5·9	6·2	6·6	6·7	6·5	6·5	6·1	5·7	6·1	6·1	6·0	6·1	6·5	6·8	7·0	7·2	6·8	6·7	6·4	6·1	5·9	6·1	6·1	5·8	5·8	6·3
Feb.	5·9	6·2	6·0	6·2	6·4	6·5	6·7	6·3	6·7	6·4	6·0	6·3	6·7	6·7	6·5	6·8	6·9	7·1	6·7	6·6	6·6	6·4	6·4	6·4	6·1	6·5
Mar.	4·9	5·0	5·3	4·9	5·0	4·8	4·9	4·6	4·6	4·6	5·0	5·7	5·6	5·6	5·7	5·6	5·9	5·6	5·5	4·7	4·6	4·0	4·5	4·4	4·7	5·0
April	4·7	5·0	5·3	5·6	5·4	5·1	5·4	5·3	5·3	5·8	6·4	7·1	7·4	7·8	7·6	7·3	7·7	7·1	6·7	5·9	5·2	5·1	4·6	4·7	4·8	6·0
May	5·6	5·5	5·8	5·7	5·3	4·9	4·9	5·3	5·7	5·9	5·9	6·5	6·4	6·8	6·8	6·4	6·6	5·8	5·7	5·7	5·5	5·4	5·3	5·4	5·4	5·8
June	4·7	4·6	4·9	4·7	4·4	4·6	4·7	5·0	5·3	5·4	5·9	6·0	6·5	6·2	6·5	6·6	6·8	6·3	6·3	5·8	5·4	5·2	5·1	5·1	5·0	5·5
July	2·9	2·8	2·7	2·9	2·8	3·0	2·8	3·3	3·8	4·0	4·4	4·9	4·9	5·1	5·4	5·5	5·8	5·4	5·1	4·0	3·2	2·7	2·7	2·8	2·7	3·9
Aug.	2·5	2·4	2·7	2·6	2·7	2·9	3·0	2·3	2·7	3·4	3·8	4·2	4·6	4·8	5·1	5·1	5·1	4·8	4·4	3·6	3·4	3·1	3·3	2·9	2·6	3·6
Sept.	4·5	4·8	4·7	4·4	4·4	4·3	4·6	4·6	4·8	5·6	6·0	6·2	6·5	6·6	6·8	6·6	6·4	6·2	5·5	5·0	4·6	4·7	4·9	5·1	4·6	5·3
Oct.	3·9	3·5	3·4	3·7	4·0	3·6	3·8	4·1	4·3	4·4	4·8	5·0	5·5	5·6	5·9	5·8	5·7	5·4	4·7	4·8	4·6	4·4	4·2	4·0	3·8	4·5
Nov.	4·7	5·1	5·4	5·4	5·4	5·0	4·9	4·8	4·7	5·3	5·7	6·3	6·3	6·4	6·2	6·0	5·8	5·3	5·3	5·1	4·8	4·4	4·3	4·3	4·8	5·3
Dec.	7·7	8·0	7·7	7·9	8·2	7·5	7·3	7·4	7·0	7·0	7·0	7·4	7·7	8·1	8·0	8·3	8·1	7·9	7·8	7·6	7·6	7·7	8·0	7·9	7·8	7·7
Year	4·8	4·9	5·0	5·1	5·0	4·9	4·9	4·9	5·1	5·3	5·6	6·0	6·2	6·4	6·5	6·4	6·5	6·1	5·8	5·4	5·1	4·9	4·9	4·9	4·8	5·5

Richmond (Kew Obs.) : H*a* = 25 m. h*a* = 20 m. **1919.**

G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	24	Mean
	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s
Jan.	3·1	3·0	3·0	3·3	3·0	3·5	3·4	3·3	3·3	3·3	3·5	3·9	3·9	4·1	4·1	3·8	3·6	3·5	3·4	3·4	3·4	3·7	3·4	3·4	3·2	3·5
Feb.	2·7	2·7	2·6	2·7	2·5	2·8	2·7	2·9	2·7	3·0	3·4	3·8	3·8	3·8	3·9	4·1	3·7	3·6	3·3	3·3	3·1	3·0	3·0	2·9	2·7	3·2
Mar.	3·4	3·7	3·6	3·8	3·6	3·9	3·8	4·2	4·3	4·9	5·3	6·0	5·6	5·7	5·3	5·7	4·9	4·9	4·1	4·1	3·6	3·5	3·5	3·6	3·4	4·4
April	2·8	3·1	3·1	3·1	3·0	2·7	2·8	3·4	3·7	4·1	4·1	4·4	4·5	4·7	4·6	4·7	4·6	4·5	3·8	3·5	3·1	3·1	2·9	2·9	2·8	3·6
May	2·6	2·4	2·2	2·2	2·1	2·2	2·4	2·8	3·2	3·5	3·9	4·4	4·6	5·1	4·8	5·1	4·9	5·3	4·8	4·5	3·9	3·2	2·8	2·7	2·5	3·6
June	2·1	2·2	1·9	2·0	2·0	2·2	2·4	2·9	3·2	3·7	3·9	4·1	4·0	4·4	4·5	4·6	4·4	4·4	4·3	3·6	3·2	2·5	2·3	2·5	2·2	3·2
July	1·8	1·6	1·6	1·7	1·8	1·9	2·2	2·6	2·7	2·8	2·8	3·0	3·2	3·4	3·2	3·2	3·1	3·0	2·7	2·6	2·2	2·0	2·0	2·0	1·8	2·5
Aug.	2·2	2·1	2·0	1·9	1·9	1·9	2·3	2·9	3·4	3·6	4·1	4·6	4·6	4·7	4·3	4·4	4·2	4·3	3·9	3·1	2·7	2·4	2·5	2·3	2·1	3·2
Sept.	1·9	1·9	1·8	1·9	2·0	1·9	1·9	2·2	2·4	2·9	3·6	4·1	4·2	4·5	4·1	4·2	3·5	3·3	2·5	2·6	2·2	2·1	1·9	2·1	2·0	2·7
Oct.	1·8	1·7	1·7	2·0	2·1	1·9	2·0	2·1	2·4	2·7	3·2	3·5	3·7	4·1	4·0	3·6	2·9	2·6	2·2	2·3	2·4	2·3	2·0	2·1	1·9	2·6
Nov.	3·4	3·5	3·3	3·3	3·1	3·1	2·7	2·9	2·9	3·3	3·5	4·1	4·2	4·5	4·0	4·0	3·5	3·5	3·4	3·7	3·5	3·7	3·5	3·6	3·5	3·5
Dec.	3·9	4·1	4·0	4·1	4·2	4·4	4·0	4·3	4·2	4·4	4·9	4·7	4·8	5·1	4·9	5·1	4·4	4·6	4·3	4·7	4·5	4·8	4·3	4·2	3·7	4·4
Year	2·6	2·7	2·6	2·7	2·6	2·7	2·7	3·0	3·2	3·5	3·9	4·2	4·3	4·5	4·3	4·4	4·0	4·0	3·6	3·5	3·2	3·0	2·8	2·9	2·7	3·4

Note.—At Aberdeen, Cahirciveen and Richmond, the speed of the wind is obtained from the records of a Robinson Cup-anemometer. At Eskdalemuir the speed is obtained from the records of a Dines Pressure-tube Anemometer.

RAINFALL: MONTHLY TOTALS OF HOURLY VALUES.

Amounts, in millimetres, for periods of sixty minutes, centred at the exact hours, Greenwich Mean Time.*

Aberdeen : H*r* (height of receiving surface above M.S.L.)=H (height of station above M.S.L.)+h*r* (height of receiving surface above ground). = 14·0 metres + 0·6 metres. **1919.**

G.M.T.	0 to 0·5	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	23·5 to 24	Day.
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Jan.	1·5	5·7	7·3	5·0	4·2	2·9	4·4	4·8	2·9	5·7	2·9	2·2	1·6	2·3	3·0	2·7	2·3	3·1	3·7	2·2	2·3	3·5	4·5	6·5	1·9	89·1
Feb.	0·7	2·4	2·4	1·4	1·1	1·0	1·8	1·6	1·4	1·5	1·6	0·8	1·1	3·5	1·0	1·3	1·5	1·8	1·5	2·3	2·3	2·6	4·9	2·1	1·0	44·6
Mar.	0·1	0·7	0·4	0·3	0·8	0·5	0·7	4·9	2·7	1·3	1·2	4·3	4·8	3·0	3·6	2·4	2·5	3·5	0·3	0·3	2·0	2·3	1·4	1·6	0·5	46·1
April	0·9	1·3	1·1	1·4	2·4	6·4	8·0	9·2	5·1	7·3	4·7	1·1	1·7	0·9	2·7	1·5	3·4	3·0	1·4	1·2	2·0	0·8	1·7	1·9	1·4	72·5
May	0·0	0·1	0·4	0·4	0·4	1·6	0·4	0·1	0·0	0·0	0·0	0·0	0·0	0·9	0·1	0·5	1·6	0·0	2·3	1·9	1·9	1·4	0·6	0·4	0·0	15·0
June	0·3	1·0	0·6	2·4	1·9	1·5	1·0	1·7	1·9	0·7	2·3	1·4	2·0	2·2	1·3	1·1	1·0	0·4	2·1	1·8	1·0	2·1	1·1	0·8	0·2	33·8
July	0·1	0·1	0·1	0·0	0·0	0·0	0·0	0·6	0·5	2·7	2·2	2·7	3·6	1·4	1·1	0·9	1·9	0·5	2·0	0·6	0·6	2·5	1·4	1·0	0·5	27·0
Aug.	0·6	2·0	2·5	2·3	5·0	3·7	4·1	5·2	1·9	1·2	0·5	0·6	0·9	1·0	0·8	0·6	2·4	4·4	3·3	1·1	1·0	1·9	1·5	0·6	0·6	49·7
Sept.	1·1	1·5	5·6	4·8	2·9	3·1	3·2	3·6	2·7	2·6	1·9	2·7	4·7	3·4	1·4	2·2	1·9	9·1	3·6	1·6	1·9	0·1	0·0	0·6	0·4	66·6
Oct.	2·7	3·3	1·6	2·1	4·8	2·2	2·6	3·4	2·7	1·8	2·8	1·2	1·2	1·3	3·9	4·6	3·5	3·7	3·6	2·5	2·7	3·0	5·2	7·1	1·4	74·9
Nov.	5·1	5·7	2·4	3·2	3·7	2·4	2·9	2·7	6·3	7·3	2·3	5·1	3·3	1·8	1·1	2·3	4·3	4·5	3·5	4·7	4·8	7·5	7·7	13·3	5·6	113·5
Dec.	3·7	13·1	11·6	10·9	9·8	10·0	6·2	5·2	8·1	8·6	2·7	5·2	3·6	4·4	5·0	4·1	1·7	0·9	0·8	2·6	3·1	5·7	5·2	6·0	5·8	144·0
Year	10·8	36·9	36·0	34·2	37·0	35·3	35·3	43·0	36·2	40·7	25·1	27·3	28·5	26·1	25·0	24·2	28·0	34·9	28·1	22·8	25·6	33·4	35·2	41·9	19·3	776·8

Eskdalemuir : H*r* = 242·0 m. + 0·4 m. **1919.**

G.M.T.	0 to 0·5	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	23·5 to 24	Day.
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm
Jan.	1·5	4·5	13·5	13·0	8·6	4·7	4·8	6·5	4·8	5·9	4·6	5·7	5·2	3·7	4·8	5·2	7·3	5·1	6·1	7·6	2·8	3·1	2·0	2·5	1·7	135·2
Feb.	0·4	0·8	1·6	0·3	0·5	2·1	1·3	1·7	0·6	0·0	0·8	0·8	0·7	0·4	0·6	0·5	1·6	0·9	0·8	1·4	0·1	0·2	0·3	0·3	0·2	18·9
Mar.	3·3	2·3	1·8	2·4	4·3	5·1	4·9	5·8	4·0	3·6	6·0	7·3	3·4	5·3	5·6	3·9	4·1	3·9	2·0	2·1	4·0	3·8	5·6	7·0	2·4	103·9
April	0·8	2·5	1·3	2·6	0·6	3·0	4·5	3·5	4·5	8·1	7·1	6·6	3·8	3·0	3·3	1·4	3·2	2·6	3·3	1·8	2·2	0·8	1·3	2·0	1·6	75·4
May	0·7	2·6	1·5	1·8	1·8	1·2	1·9	2·4	1·2	0·3	0·5	0·6	1·8	1·1	1·3	2·0	6·0	4·5	1·4	1·2	5·2	2·9	0·3	4·3	1·2	49·7
June	1·0	2·0	2·9	4·1	1·6	0·6	1·9	4·5	5·9	4·4	2·9	0·9	0·4	0·8	2·6	2·7	2·2	6·1	3·8	2·8	1·3	3·2	1·0	1·7	1·5	62·8
July	0·9	0·8	1·1	2·6	3·5	1·3	0·8	0·4	0·4	0·5	0·5	0·2	0·3	4·2	5·1	5·4	1·9	0·5	0·2	0·4	0·0	0·0	0·0	1·3	1·8	34·1
Aug.	1·9	5·4	13·4	12·2	7·5	2·6	2·8	3·4	1·8	1·8	1·9	1·3	6·8	6·1	4·0	4·0	5·1	4·4	4·8	6·2	4·3	1·2	1·1	0·8	6·5	111·3
Sept.	1·5	3·3	2·6	7·1	8·9	11·6	6·3	3·8	5·5	6·2	8·4	9·5	6·4	8·6	12·9	11·4	8·5	5·8	5·0	2·3	2·7	4·0	5·1	4·4	2·5	154·3
Oct.	2·9	3·0	3·4	0·8	0·5	0·8	1·3	0·8	3·7	4·0	2·5	0·7	2·8	2·5	1·9	5·0	4·5	8·7	5·8	2·4	1·3	1·9	3·0	3·6	4·8	72·6
Nov.	1·6	4·5	3·9	3·1	3·3	6·9	3·9	6·0	4·8	3·6	3·4	0·6	0·8	2·4	4·3	3·8	5·3	7·2	14·1	9·2	8·8	16·1	9·1	7·6	3·3	137·6
Dec.	6·9	17·9	18·5	10·7	11·1	5·0	8·0	9·5	8·4	11·6	6·7	7·7	8·8	6·3	11·6	12·0	13·3	8·5	9·3	10·2	10·4	11·1	14·3	13·8	7·8	259·4
Year	23·4	49·6	65·5	60·7	52·2	44·9	42·4	48·3	45·6	50·0	45·3	41·9	41·2	44·4	58·0	57·3	63·0	58·2	56·6	47·6	43·1	48·3	43·1	49·3	35·3	1215·2

Cahirciveen (Valencia Obs.) : H*r* = 9·1 m. + 0·5 m. **1919.**

G.M.T.	0 to 0·5	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	23·5 to 24	Day.
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Jan.	4·2	7·2	4·2	6·6	6·6	5·8	8·5	7·5	7·3	11·6	7·0	10·7	7·4	16·0	6·6	7·5	13·2	21·1	8·5	8·0	11·0	9·6	4·7	4·0	3·4	208·2
Feb.	1·1	2·2	0·6	3·1	2·4	1·2	5·4	3·9	4·0	0·1	2·3	5·7	2·8	7·4	2·4	3·9	4·2	2·4	2·5	2·3	2·8	1·2	2·6	5·1	1·7	73·3
Mar.	2·9	4·7	5·2	9·2	7·3	7·3	5·2	2·4	4·5	3·1	0·8	1·9	3·3	3·2	2·8	3·5	2·5	3·9	7·9	8·4	5·9	2·0	4·8	4·4	1·7	108·8
April	0·5	2·3	1·4	3·7	2·8	2·4	1·2	1·4	2·5	1·3	2·9	0·8	0·4	0·7	2·6	0·8	1·4	2·0	2·9	2·9	2·8	3·2	4·3	2·8	0·5	50·5
May	3·1	5·8	8·5	5·1	9·9	8·2	9·0	2·9	1·3	4·8	4·1	4·1	4·4	3·1	3·6	2·6	3·3	1·6	3·2	3·9	5·8	5·0	7·4	5·8	2·0	118·5
June	0·3	1·0	2·4	4·3	3·6	3·8	4·5	1·8	6·6	0·9	1·8	0·9	0·9	0·6	2·8	2·3	0·0	1·2	1·3	1·9	4·0	4·2	1·2	1·0	0·3	53·6
July	0·3	2·5	3·3	3·2	1·8	2·3	2·9	1·4	4·1	2·5	3·5	1·3	2·1	2·1	1·2	0·5	1·8	1·0	0·3	0·2	2·3	3·5	1·3	0·9	0·7	47·0
Aug.	1·9	5·7	3·1	1·5	3·9	4·7	5·7	4·0	0·9	0·9	0·7	4·1	2·9	3·4	1·3	0·5	1·4	1·0	2·2	2·5	1·3	4·1	9·0	4·6	1·0	72·3
Sept.	7·2	5·3	10·5	2·9	2·6	2·3	4·6	1·4	3·7	0·8	0·9	0·3	0·2	0·9	0·2	0·9	1·1	3·0	4·1	3·2	7·2	12·4	11·1	7·9	7·2	101·9
Oct.	10·0	8·5	6·4	6·5	4·4	3·4	3·2	2·5	1·1	2·1	0·9	1·0	0·9	1·7	0·4	0·7	0·7	1·0	1·3	1·8	2·2	1·7	0·6	1·8	1·2	66·0
Nov.	1·7	1·6	1·3	2·6	2·2	1·0	1·5	3·7	3·0	3·4	8·5	7·4	8·2	5·4	4·5	6·4	7·3	1·9	2·3	2·7	0·7	0·7	1·6	1·6	0·6	81·8
Dec.	3·6	7·7	5·9	9·4	10·0	4·8	7·8	6·5	9·7	8·2	7·3	5·6	12·1	7·8	8·7	9·5	4·1	3·2	5·1	6·5	5·4	5·6	9·6	8·7	7·0	179·8
Year	36·8	54·5	52·8	58·1	57·5	47·2	59·5	39·4	48·7	39·7	40·7	43·8	45·6	52·3	37·1	39·1	41·0	43·3	41·6	44·3	51·4	53·2	58·2	48·6	27·3	1161·7

Richmond (Kew Obs.) : H*r* = 5·5 m. + 0·5 m. **1919.**

G.M.T.	0 to 0·5	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	23·5 to 24	Day.
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Jan.	4·1	8·0	5·6	1·3	0·6	0·9	0·4	0·4	1·2	0·9	2·0	1·5	2·6	3·8	1·9	3·8	4·9	4·1	8·4	3·9	3·0	4·4	6·0	5·2	3·8	82·7
Feb.	0·5	1·4	1·8	1·3	1·1	1·8	3·8	0·9	1·3	1·5	1·5	2·0	2·2	2·6	3·8	6·7	6·3	3·7	5·9	2·4	2·3	0·2	0·2	0·5	0·4	56·1
Mar.	0·3	2·9	2·2	1·8	7·7	6·3	3·3	3·4	7·3	2·3	1·7	2·3	2·9	3·1	2·5	3·4	3·3	3·5	3·5	3·8	3·7	2·7	2·3	0·7	0·8	77·7
April	0·0	0·7	1·4	1·6	2·2	2·3	1·8	2·2	1·8	0·7	3·0	3·8	3·6	5·4	6·2	6·0	2·9	2·6	0·2	0·9	0·1	0·2	0·2	0·3	0·3	50·4
May	0·1	0·0	0·0	0·0	1·6	2·9	1·3	0·6	0·5	0·7	0·5	0·2	0·0	0·1	0·0	0·0	0·0	0·0	0·1	0·0	0·0	0·0	0·0	0·0	0·6	9·2
June	0·0	0·0	0·8	0·1	0·1	0·3	2·9	1·8	0·8	0·9	1·3	2·0	2·7	0·9	1·5	3·0	3·4	3·5	2·7	0·9	0·4	0·0	0·0	0·0	0·0	30·0
July	0·7	0·5	2·6	2·3	1·3	1·8	2·6	8·9	4·3	4·0	3·8	3·4	2·2	1·8	0·1	1·5	4·5	6·2	2·3	6·8	2·5	0·7	0·6	1·9	0·1	67·4
Aug.	1·3	1·9	0·3	1·2	0·4	1·9	7·2	6·1	2·7	1·2	8·2	4·0	1·3	5·2	1·2	0·0	0·3	1·3	1·3	2·1	1·1	0·6	2·1	0·6	0·2	53·7
Sept.	1·1	0·5	0·1	3·3	5·5	0·2	0·2	0·3	0·0	0·3	0·0	0·0	1·0	0·1	0·1	2·1	0·7	4·7	4·4	4·7	2·6	0·3	0·4	3·0	1·3	36·9
Oct.	0·1	0·1	0·0	0·0	0·8	0·6	0·8	0·4	0·0	0·0	0·0	0·4	2·4	1·5	1·1	1·5	1·1	0·5	0·4	1·3	0·8	0·3	0·1	0·1	0·3	14·6
Nov.	0·4	0·4	0·5	0·4	1·0	0·9	2·9	3·9	4·1	1·5	0·8	0·1	0·9	1·4	0·7	0·3	0·0	0·0	0·0	0·1	1·2	2·3	1·7	1·0	0·1	26·6
Dec.	0·1	0·8	0·3	0·7	0·8	1·9	2·0	2·9	9·2	6·3	4·5	6·2	6·9	3·9	2·1	4·7	6·0	7·3	5·4	3·9	7·8	5·6	4·8	0·7	0·3	95·1
Year	8·7	17·2	15·6	14·0	23·1	21·8	29·2	31·8	33·2	20·3	27·3	25·9	28·7	29·8	21·2	33·0	33·4	37·4	34·6	30·8	25·5	17·3	18·4	14·0	8·2	600·4

*The half-hours before and after midnight are tabulated separately.

Note.—The amounts of rainfall are obtained at each observatory from the autographic records of a Beckley raingauge.

For **Falmouth** see p. 55.

DURATION OF BRIGHT SUNSHINE: MONTHLY MEANS OF HOURLY VALUES.

Amounts for periods of sixty minutes centering at the hours of Local Apparent Time.

Aberdeen : hs (height of recorder above ground) = 20·7 metres. **1919.**

Hour, L.A.T.	4	5	6	7	8	9	10	11	Noon.	13	14	15	16	17	18	19	20	Day.
	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.
Jan.	..	..	..	..	..	·04	·17	·27	·24	·21	·20	·07	..	..	..	..	..	1·20
Feb.	..	..	..	..	·08	·19	·27	·30	·30	·29	·26	·22	·09	..	..	..	..	2·00
Mar.	..	..	..	·12	·40	·48	·53	·43	·39	·37	·48	·33	·42	·21	·01	..	..	4·17
April	..	..	·14	·22	·31	·37	·38	·31	·31	·34	·37	·32	·33	·28	·14	·04	..	3·86
May	..	·14	·32	·46	·58	·54	·58	·59	·61	·53	·47	·40	·35	·33	·28	·16	..	6·34
June	·09	·22	·30	·32	·33	·43	·40	·49	·54	·49	·55	·48	·45	·37	·30	·26	·10	6·12
July	·04	·17	·26	·33	·31	·30	·38	·46	·50	·50	·57	·55	·47	·42	·30	·22	·05	5·83
Aug.	..	·12	·26	·37	·51	·50	·51	·43	·45	·41	·30	·31	·29	·35	·24	·09	..	5·14
Sept.	..	..	·05	·31	·44	·44	·51	·51	·57	·65	·60	·54	·46	·26	·03	..	..	5·37
Oct.	..	..	..	·01	·18	·41	·41	·49	·53	·40	·35	·26	·15	·04	..	..	..	3·23
Nov.	..	..	..	..	..	·12	·37	·41	·38	·38	·33	·15	·01	..	..	..	..	2·15
Dec.	..	..	..	..	..	·03	·20	·29	·31	·23	·16	·01	..	..	..	..	..	1·23
Year	·01	·05	·11	·18	·26	·32	·39	·42	·43	·40	·39	·30	·25	·19	·11	·06	·01	3·88

Eskdalemuir : hs = 1·5 m. **1919.**

Hour, L.A.T.	4	5	6	7	8	9	10	11	Noon.	13	14	15	16	17	18	19	20	Day.
	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.
Jan.	..	..	..	..	..	·08	·13	·21	·30	·26	·11	·06	..	..	..	..	..	1·15
Feb.	..	..	..	..	·11	·19	·22	·25	·23	·30	·29	·25	·11	·02	..	..	..	1·97
Mar.	..	..	·01	·13	·31	·33	·38	·41	·32	·36	·34	·33	·27	·12	..	..	..	3·31
April	..	·01	·05	·23	·30	·32	·30	·33	·35	·33	·28	·36	·31	·22	·12	·01	..	3·52
May	..	·15	·37	·45	·62	·60	·62	·62	·66	·60	·54	·55	·53	·48	·35	·06	..	7·20
June	·02	·22	·37	·45	·48	·57	·52	·42	·42	·47	·45	·32	·34	·36	·28	·20	..	5·89
July	..	·15	·34	·33	·35	·40	·40	·45	·51	·46	·50	·53	·51	·47	·41	·22	·01	6·04
Aug.	..	·03	·15	·25	·37	·31	·37	·47	·48	·54	·47	·47	·53	·39	·32	·08	..	5·23
Sept.	..	..	·01	·21	·32	·40	·42	·44	·42	·51	·45	·31	·37	·30	·04	..	..	4·20
Oct.	..	..	..	·08	·34	·41	·45	·45	·41	·37	·39	·30	·19	·02	..	..	..	3·41
Nov.	..	..	..	..	·03	·22	·30	·33	·37	·29	·26	·19	·05	..	..	..	..	2·04
Dec.	..	..	..	..	..	·05	·11	·17	·18	·19	·13	·06	..	..	..	..	..	0·89
Year	..	·05	·11	·18	·27	·32	·35	·38	·39	·39	·35	·31	·27	·20	·13	·05	..	3·75

Cahirciveen (Valencia Obs.) : hs = 12·8 m. **1919.**

Hour, L.A.T.	4	5	6	7	8	9	10	11	Noon.	13	14	15	16	17	18	19	20	Day.
	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr	hr	hr.	hr.
Jan.	..	..	..	..	..	·16	·28	·37	·38	·33	·36	·20	·01	..	..	..	..	2·09
Feb.	..	..	..	..	·15	·30	·35	·31	·29	·29	·32	·28	·15	0·3	..	..	..	2·47
Mar.	..	..	..	·09	·33	·45	·50	·45	·49	·45	·41	·39	·33	·14	·01	..	..	4·04
April	..	·01	·20	·44	·48	·44	·56	·53	·58	·55	·55	·54	·46	·40	·23	·03	..	6·00
May	..	·10	·22	·28	·32	·32	·39	·35	·48	·49	·42	·44	·35	·33	·25	·09	..	4·83
June	..	·16	·22	·32	·30	·35	·33	·37	·39	·43	·43	·45	·47	·43	·32	·19	·01	5·17
July	..	·15	·25	·25	·25	·35	·43	·40	·50	·58	·61	·53	·48	·46	·34	·24	..	5·82
Aug.	..	·03	·11	·30	·41	·45	·52	·52	·45	·47	·47	·53	·41	·38	·28	·07	..	5·40
Sept.	..	..	·03	·25	·47	·54	·52	·53	·57	·56	·50	·48	·37	·27	·02	..	..	5·11
Oct.	..	..	..	·01	·20	·37	·53	·51	·47	·49	·41	·43	·33	·08	..	..	..	3·83
Nov.	..	..	..	..	·04	·39	·51	·47	·54	·56	·52	·44	·23	..	..	..	..	3·70
Dec.	..	..	..	..	..	·01	·15	·22	·24	·22	·11	·08	..	..	..	..	..	1·03
Year	..	·04	·09	·16	·25	·34	·42	·42	·45	·45	·43	·40	·30	·21	·12	·05	..	4·13

Richmond (Kew Obs.) : hs = 13·3 m. **1919.**

Hour, L.A.T.	4	5	6	7	8	9	10	11	Noon.	13	14	15	16	17	18	19	20	Day.
	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.
Jan.	..	..	..	..	..	·05	·21	·26	·14	·14	·13	·08	..	..	..	..	..	1·01
Feb.	..	..	..	..	·01	·07	·11	·13	·15	·18	·23	·15	·05	..	..	..	..	1·08
Mar.	..	..	·01	·10	·24	·34	·33	·40	·32	·30	·28	·28	·24	·09	..	..	..	2·93
April	..	..	·09	·26	·32	·36	·34	·31	·26	·30	·29	·31	·32	·32	·06	..	..	3·54
May	..	·08	·34	·52	·54	·55	·58	·61	·60	·61	·68	·67	·61	·65	·50	·18	..	7·72
June	..	·25	·50	·50	·56	·49	·51	·44	·46	·54	·52	·50	·58	·61	·55	·31	·02	7·34
July.	..	·05	·17	·26	·31	·34	·31	·26	·30	·25	·30	·31	·28	·26	·28	·15	..	3·83
Aug.	..	·07	·34	·45	·52	·66	·63	·61	·60	·61	·62	·61	·57	·50	·46	·07	..	7·32
Sept.	..	..	..	·18	·35	·46	·54	·58	·58	·54	·49	·48	·44	·36	·08	..	..	5·08
Oct.	..	..	..	·05	·27	·37	·41	·50	·50	·52	·44	·49	·35	·04	..	..	..	3·94
Nov.	..	..	..	..	..	·15	·26	·23	·28	·27	·20	·11	·01	..	..	..	..	1·51
Dec.	..	..	..	..	..	·02	·13	·15	·16	·15	·13	·08	..	..	..	..	..	0·82
Year	..	·04	·12	·19	·26	·32	·36	·37	·36	·37	·36	·34	·29	·24	·16	·06	..	3·84

Note.—The hourly duration of Sunshine is obtained from the records of the Campbell-Stokes Recorder, an instrument in which the sun's rays are focussed through a 10 cm. spherical lens of crown glass upon a strip of blue card exposed in a metal bowl, the duration of bright sunshine being shown by the length of the scorch on the card.

For **Falmouth** see p. 55.

I.—TERRESTRIAL MAGNETIC FORCE: NORTH COMPONENT.

Eskdalemuir. (X.) *Mean Values for periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **January, 1919.**

15,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day.	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	968	964	963	965	965	974	972	974	974	966	967	969	967	965	965	965	965	964	965	956	960	966	969	971	961	966
2	960	964	965	964	966	968	970	972	972	969	964	961	961	964	968	968	969	972	973	974	974	973	971	970	969	968
3	969	970	969	972	974	975	978	979	978	975	973	970	970	974	978	978	979	980	987	978	980	959	940	946	939	972
4	939	912	949	934	930	944	941	954	953	924	913	934	911	900	914	931	938	939	929	958	958	925	959	935	942	934
5	942	941	932	873	919	944	949	950	916	939	945	909	929	943	954	947	894	920	922	950	969	973	959	939	935	936
6	935	943	947	946	960	959	955	956	954	934	914	915	940	915	931	945	944	949	959	963	956	954	943	944	962	945
7	961	952	953	945	958	964	967	969	942	951	929	924	948	940	932	939	948	949	960	958	960	966	967	967	968	952
8	968	967	963	958	963	961	963	953	963	964	948	943	943	940	933	958	959	958	958	964	963	976	978	968	967	959
9	967	992	966	961	962	967	966	960	967	967	958	953	945	944	958	962	963	965	962	968	972	968	969	969	969	964
10	969	967	964	964	967	973	972	973	973	968	952	943	943	951	963	970	967	967	969	970	969	962	966	968	969	965
11	969	968	967	970	973	974	977	980	973	965	959	954	952	953	959	964	968	971	973	974	974	972	971	970	974	968
12	973	973	972	970	972	973	976	982	976	967	953	945	954	963	972	969	962	960	961	953	970	973	973	975	981	968
13	981	981	987	982	991	987	1009	969	922	921	930	928	941	956	956	961	968	972	974	974	972	973	980	971	972	966
14	972	981	987	983	978	964	946	958	964	953	946	937	933	937	946	955	957	962	958	962	962	967	967	967	967	960
15	967	966	966	965	967	963	960	972	969	966	957	952	943	941	956	953	958	961	961	962	963	970	979	969	968	962
16	968	972	972	969	968	972	980	973	968	975	974	964	957	952	947	959	932	918	937	978	947	966	935	944	969	959
17	969	936	936	925	941	962	959	953	943	954	956	942	921	937	948	955	947	966	960	965	973	957	952	926	957	949
18	956	967	951	945	957	963	971	965	954	937	943	952	949	957	952	941	950	931	971	942	971	950	940	979	986	955
19	986	941	947	947	971	955	961	961	961	956	939	951	947	937	933	958	944	958	951	945	960	967	965	954	969	954
20	969	966	965	961	956	962	966	965	971	970	961	953	955	942	947	961	959	954	955	961	960	969	970	966	969	961
21	969	957	960	947	970	976	971	974	976	961	956	956	956	962	961	954	966	971	980	975	966	964	990	968	968	966
22	968	972	970	967	965	967	961	967	973	968	956	951	947	951	956	961	966	954	955	957	981	968	975	968	979	964
23	979	965	964	971	965	970	971	972	967	970	966	956	946	953	961	968	968	968	955	963	966	975	983	985	978	967
24	978	971	971	969	970	970	965	973	975	970	960	953	951	951	947	959	967	971	970	975	975	974	971	975	976	967
25	976	970	969	974	975	980	980	979	975	971	964	956	950	957	967	970	970	972	974	975	975	975	975	971	975	971
26	975	975	974	971	971	973	976	979	980	977	970	961	956	955	960	970	975	976	977	980	979	976	979	978	979	973
27	979	979	977	977	979	980	982	982	984	976	967	964	962	957	959	967	974	980	982	982	981	980	977	977	975	975
28	975	976	982	977	979	982	984	987	986	983	976	968	968	971	976	964	960	981	987	984	974	974	951	962	966	975
29	966	995	970	968	970	968	972	974	975	976	968	959	950	950	957	967	970	972	975	976	961	958	967	972	968	968
30	968	969	968	971	972	974	972	974	972	969	954	951	947	953	949	951	955	960	967	968	968	961	962	969	971	964
31	971	972	975	983	977	971	973	981	976	977	976	981	982	994	992	985	982	962	957	968	988	956	969	931	968	974
Mean	967	965	965	960	966	968	969	970	966	962	955	950	949	951	955	960	959	961	963	966	969	966	966	963	968	962

II.—TERRESTRIAL MAGNETIC FORCE: WEST COMPONENT.

Eskdalemuir. (—Y.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **January, 1919.**

4,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	894	893	894	896	894	893	903	900	901	899	905	911	910	914	914	910	910	913	909	906	900	899	894	893	891	902
2	891	894	899	899	899	899	898	897	896	896	900	905	905	912	907	903	903	903	901	901	898	896	895	895	896	900
3	896	899	899	900	902	903	904	902	903	904	903	903	910	913	911	913	910	911	916	931	809	803	883	910	894	897
4	894	863	802	851	881	882	879	891	895	899	921	926	937	937	931	913	900	927	957	954	782	847	868	809	855	889
5	855	877	870	899	920	910	905	911	916	902	918	899	906	910	905	907	856	797	883	876	890	871	873	855	886	889
6	886	891	905	896	887	895	895	896	894	888	899	902	905	896	896	884	886	895	899	886	877	851	852	907	890	890
7	890	891	896	904	902	894	896	903	899	903	894	893	899	903	900	900	903	893	886	890	883	884	884	898	899	896
8	899	885	895	891	893	894	903	910	903	899	895	899	905	911	894	903	904	903	892	899	894	884	885	884	878	896
9	878	891	889	890	896	899	899	906	901	891	898	901	900	899	905	903	901	899	892	891	895	894	894	899	892	897
10	892	891	894	894	895	896	896	895	894	889	891	899	905	910	913	910	903	899	901	899	896	887	880	893	899	897
11	899	899	899	900	900	899	899	898	894	894	899	905	910	914	915	905	902	901	899	899	897	895	893	893	893	900
12	893	893	897	900	899	899	895	896	898	896	899	905	906	913	916	910	909	909	905	894	895	895	896	900	900	901
13	900	902	905	912	905	915	930	931	927	915	929	928	915	916	915	915	917	917	930	931	909	899	894	904	899	915
14	899	900	898	899	898	897	909	946	913	894	888	899	908	905	911	909	905	903	903	884	895	894	891	891	894	902
15	894	894	896	895	899	893	899	893	886	884	894	900	906	913	924	917	918	915	909	905	898	887	857	871	886	898
16	886	895	891	891	892	889	894	900	894	894	903	914	916	936	930	940	930	907	917	894	855	849	819	860	893	896
17	893	888	870	892	901	872	880	920	906	898	910	905	904	914	913	921	910	899	905	867	841	839	855	884	892	891
18	892	877	856	888	877	893	899	904	905	910	917	912	916	916	921	915	906	864	833	874	847	844	850	863	883	886
19	883	862	887	890	888	882	878	888	891	893	890	893	905	909	898	910	905	863	887	856	883	873	868	879	877	886
20	877	884	885	885	899	899	893	898	899	900	901	900	911	914	915	926	930	887	912	896	887	883	897	890	866	898
21	866	862	892	900	882	890	895	894	905	892	899	904	913	911	913	910	904	911	892	901	899	856	866	892	894	894
22	894	905	882	886	893	890	893	895	894	889	889	899	900	910	918	918	917	907	905	900	870	886	880	894	885	896
23	885	883	897	888	885	880	883	893	897	894	899	903	899	905	908	910	907	900	888	890	889	886	891	893	890	894
24	890	895	894	894	893	888	893	896	892	889	896	903	916	921	923	915	913	906	904	902	900	896	892	872	884	900
25	884	891	894	891	884	887	888	892	893	893	893	902	909	915	916	910	909	905	905	905	901	897	898	896	895	898
26	895	893	894	891	891	895	896	896	894	892	894	899	906	913	920	911	905	905	904	902	902	899	894	887	894	899
27	894	898	899	899	899	896	896	895	893	887	890	894	901	909	912	910	907	906	905	905	903	902	899	895	894	900
28	894	894	894	894	899	900	902	899	899	901	905	906	915	922	931	931	920	909	905	907	892	852	872	879	880	901
29	880	865	866	878	882	886	888	890	890	894	899	900	920	915	916	915	910	905	904	905	898	911	873	886	895	893
30	895	892	894	895	898	899	898	894	891	889	890	904	910	925	926	936	921	920	910	906	902	899	894	887	888	903
31	888	888	886	878	875	886	893	894	890	894	906	921	937	945	933	925	918	917	901	838	827	862	859	833	833	890
Mean	889	888	888	892	894	894	896	901	898	896	900	904	910	914	915	913	908	900	902	897	881	878	879	884	887	897

III.—TERRESTRIAL MAGNETIC FORCE: VERTICAL COMPONENT.

Eskdalemuir. (Z.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **January, 1919.**

44,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1099	1098	1098	1096	1094	1094	1093	1093	1093	1093	1093	1091	1093	1097	1098	1098	1096	1097	1097	1103	1110	1108	1104	1101	1100	1097
2	1101	1099	1097	1097	1095	1094	1093	1093	1091	1091	1092	1089	1090	1089	1092	1095	1095	1095	1094	1094	1094	1094	1094	1094	1094	1094
3	1095	1094	1094	1094	1092	1090	1090	1089	1088	1087	1088	1988	1087	1088	1090	1090	1090	1090	1088	1090	1184	1218	1155	1128	1132	1104
4	1133	1121	1100	1078	1092	1098	1098	1098	1099	1100	1096	1097	1104	1136	1147	1153	1169	1210	1229	1211	1128	1108	1099	1049	1024	1121
5	1024	1065	1071	1034	1046	1066	1087	1091	1095	1100	1101	1112	1119	1116	1116	1116	1157	1183	1154	1136	1101	1093	1085	1084	1073	1099
6	1074	1074	1066	1077	1092	1095	1097	1098	1098	1097	1103	1106	1104	1113	1133	1141	1140	1125	1116	1111	1113	1113	1107	1073	1088	1103
7	1089	1098	1100	1097	1089	1093	1095	1093	1098	1099	1104	1109	1107	1106	1111	1111	1111	1111	1112	1112	1113	1108	1102	1093	1080	1102
8	1081	1083	1082	1085	1087	1090	1088	1090	1094	1095	1099	1102	1101	1099	1110	1107	1106	1106	1108	1107	1107	1106	1099	1098	1097	1097
9	1098	1086	1084	1091	1092	1093	1095	1095	1094	1095	1091	1093	1094	1095	1096	1098	1101	1102	1103	1102	1100	1099	1098	1095	1092	1095
10	1092	1091	1093	1094	1095	1095	1095	1095	1095	1098	1099	1100	1101	1103	1102	1101	1100	1100	1100	1100	1100	1102	1103	1098	1095	1098
11	1095	1093	1093	1093	1093	1093	1093	1094	1096	1099	1099	1099	1100	1098	1097	1099	1099	1097	1096	1097	1097	1097	1097	1095	1094	1096
12	1094	1092	1091	1091	1092	1092	1091	1091	1092	1094	1095	1095	1095	1092	1095	1095	1097	1098	1100	1104	1100	1098	1095	1094	1090	1095
13	1091	1090	1082	1075	1076	1077	1063	1066	1076	1081	1081	1091	1103	1104	1105	1103	1100	1100	1104	1108	1112	1108	1107	1101	1098	1092
14	1098	1096	1092	1089	1089	1087	1079	1068	1072	1083	1092	1096	1095	1096	1097	1101	1104	1108	1105	1108	1104	1101	1100	1099	1096	1094
15	1097	1097	1095	1095	1092	1085	1081	1082	1084	1084	1085	1088	1091	1092	1093	1092	1094	1095	1099	1101	1103	1106	1108	1102	1101	1094
16	1101	1097	1094	1093	1092	1089	1086	1084	1083	1081	1079	1079	1083	1085	1090	1101	1121	1147	1151	1154	1151	1139	1096	1093	1073	1102
17	1074	1054	1073	1053	1033	1056	1069	1062	1065	1074	1077	1081	1090	1098	1101	1106	1124	1120	1114	1130	1127	1125	1121	1103	1066	1089
18	1066	1075	1090	1088	1087	1089	1086	1089	1091	1092	1091	1090	1094	1098	1102	1112	1123	1151	1148	1133	1111	1098	1092	1084	1070	1099
19	1071	1079	1084	1072	1078	1075	1087	1090	1093	1093	1097	1099	1099	1099	1107	1108	1116	1124	1122	1129	1120	1088	1090	1098	1099	1097
20	1099	1095	1095	1093	1094	1094	1094	1095	1093	1091	1093	1095	1097	1095	1098	1103	1107	1119	1120	1118	1119	1111	1099	1072	1067	1099
21	1067	1082	1082	1075	1079	1079	1078	1083	1083 ~~1085~~	1086	1087	1088	1090	1091	1093	1102	1105	1103	1103	1101	1103	1112	1102	1094	1092	1091
22	1092	1078	1082	1087	1091	1092	1092	1093	1091	1091	1093	1095	1095	1094	1095	1097	1099	1104	1107	1111	1108	1102	1101	1089	1075	1095
23	1075	1078	1078	1083	1089	1091	1091	1089	1089	1089	1090	1091	1093	1094	1095	1095	1097	1099	1103	1106	1103	1101	1094	1083	1080	1092
24	1080	1086	1088	1089	1089	1089	1090	1089	1091	1091	1091	1087	1084	1086	1091	1091	1091	1095	1095	1095	1095	1095	1095	1098	1091	1091
25	1091	1090	1089	1087	1087	1086	1087	1087	1087	1089	1091	1089	1090	1091	1090	1093	1091	1090	1092	1092	1093	1094	1093	1093	1091	1090
26	1092	1090	1089	1088	1088	1088	1088	1089	1089	1088	1088	1088	1086	1083	1084	1088	1089	1090	1089	1090	1089	1090	1090	1089	1087	1088
27	1087	1086	1086	1085	1085	1085	1085	1085	1086	1087	1088	1087	1084	1082	1087	1087	1087	1087	1086	1087	1087	1087	1089	1089	1089	1086
28	1089	1089	1086	1086	1085	1084	1084	1084	1082	1083	1085	1082	1084	1085	1089	1092	1092	1091	1089	1089	1087	1109	1109	1109	1104	1090
29	1104	1092	1088	1088	1089	1088	1088	1087	1085	1085	1084	1084	1082	1082	1087	1089	1091	1091	1090	1091	1098	1097	1093	1098	1093	1089
30	1093	1091	1090	1089	1088	1087	1086	1086	1086	1085	1086	1084	1084	1081	1089	1092	1099	1096	1099	1096	1097	1101	1103	1102	1100	1091
31	1100	1096	1095	1087	1081	1082	1084	1084	1085	1083	1081	1076	1071	1070	1073	1078	1085	1094	1108	1118	1107	1096	1076	1077	1076	1086
Mean	1088	1088	1088	1086	1085	1088	1087	1087	1089	1090	1091	1092	1093	1095	1098	1101	1106	1110	1110	1110	1109	1107	1100	1093	1087	1095

IV.—ABSOLUTE OBSERVATIONS; TEMPERATURE OF THE MAGNETOGRAPHS; MAGNETIC CHARACTER FIGURES; NOTES.

Eskdalemuir. **January, 1919.**

Date	Time G.M.T. From	Time G.M.T. To	Horizontal Force.	Declination.	Dip.	Temperature in Magnet House.	Magnetic Character of day (0–2).	Date.
Jan.	h. m.	h. m.	γ	° ′ ″	° ′	a 280+		
						3·9	0	1
2	10 35	11 15	16696	17 6 45	69 40·6	3·9	0C	2
						3·9	2D	3
						3·8	2D	4
						3·8	2D	5
						3·7	1	6
7	11 23	11 50	16686	17 3 32	69 43·6	3·7	0	7
						3·7	1	8
						3·6	0	9
10	12 3	12 32	16679	17 6 31	69 42·6	3·6	0	10
						3·6	0C	11
						3·5	0	12
13	11 37	12 47	16688	17 7 32	69 42·6	3·5	1	13
						3·5	1	14
						3·4	1	15
						3·4	2	16
						3·4	1	17
						3·3	2D	18
						3·3	1	19
						3·3	1	20
						3·3	1	21
						3·2	1	22
						3·2	0	23
						3·2	0	24
						3·2	0C	25
						3·1	0C	26
						3·1	0C	27
						3·1	1	28
29	10 43	11 19	16704	17 3 32	69 41·9	3·1	1	29
						3·1	0	30
						3·0	2D	31

MAGNETIC NOTES.

January, 1919.

The most disturbed days of the month were the 3rd, 4th, 5th, 16th, 18th, and 31st; the quietest were the 1st, 2nd, 11th, 25th and 27th. A moderate disturbance began on 3rd with a sudden commencement at 18h. 14m. The auroral display which accompanied this storm was first observed at the Observatory at 19h. The main portion of the disturbance developed quickly after the sudden commencement. It included a double oscillation on N. and W. between 20h. and 22h. giving sharp maxima at 20h. 27m. on N., at 20h. 29m. on W,, and 20h. 25m. on V.; also a rapid fall of 252 γ in 6 minutes on N., ending at 20h. 35m. On the V trace, the disturbed portion of each successive 24 hours was from 3d. 19h. to 4d. 10h., 4d. 12h. to 5d. 6h., 5d. 15h. to 6d. 4h., and 6d. 13h. to 7d. 2h. It also showed two maxima on first day of the storm, but the following days only reproduced what was apparently the first of the two. The drop in value of V. from the maximum came after midnight in the first onset of the storm, but before midnight on the following days. The disturbance did not really die down until 2h. on 9th. Other sudden commencements occurred at 14d. 0h. 57m. and at 31d. 10h. 45m., the former being followed by limited movements and the latter by intense "internal" activity.

V.—TERRESTRIAL MAGNETIC FORCE: NORTH COMPONENT.

Eskdalemuir. (X.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **February, 1919.**

15,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	968	941	927	932	961	976	941	965	951	930	944	955	925	932	942	968	965	979	970	966	974	971	969	979	975	956
2	975	976	965	971	966	960	948	956	961	950	916	911	932	945	955	964	962	989	965	969	985	958	976	974	970	959
3	970	960	944	942	959	965	969	968	960	930	956	954	944	954	966	967	968	941	966	969	981	986	966	980	965	961
4	965	967	969	973	979	971	975	966	967	969	956	949	938	943	952	961	960	965	965	960	978	978	994	954	955	965
5	954	967	974	963	941	974	969	968	960	958	955	947	934	931	939	960	960	968	983	993	988	967	975	979	967	963
6	967	967	962	963	970	977	974	973	964	961	940	929	934	953	959	963	959	964	968	972	973	979	986	994	966	965
7	966	962	959	970	973	975	975	974	971	970	966	963	959	962	966	969	969	969	969	974	975	974	976	973	976	969
8	976	983	973	971	974	975	974	971	967	965	960	954	956	962	967	964	965	971	976	978	981	981	981	980	978	971
9	978	978	979	979	981	988	984	979	974	965	961	959	959	960	960	964	969	974	970	987	960	961	964	969	970	971
10	970	968	968	974	979	987	986	978	976	968	958	950	945	945	952	961	965	970	974	979	982	982	981	981	977	970
11	977	976	975	980	979	980	980	983	977	972	967	961	960	961	965	966	967	970	975	979	981	980	979	981	981	974
12	981	981	981	982	983	984	984	983	981	975	971	965	963	967	973	976	976	971	968	976	989	989	991	992	990	979
13	990	993	992	991	990	992	993	993	990	984	983	986	989	984	966	956	970	964	971	934	960	955	1036	938	965	979
14	965	955	994	964	954	964	970	954	959	953	950	945	944	956	958	959	959	958	986	1013	938	955	968	969	974	962
15	974	972	950	949	958	964	970	974	970	967	965	964	943	941	962	961	963	964	974	968	979	966	985	972	979	965
16	979	954	949	964	959	969	968	969	964	958	955	954	961	944	959	947	946	968	965	974	964	973	969	962	970	961
17	970	972	969	971	970	974	967	977	958	974	968	953	959	963	963	967	966	970	974	972	979	977	974	972	979	969
18	979	974	974	977	979	982	983	974	982	982	970	960	964	967	964	964	965	974	968	979	969	967	969	966	965	972
19	965	970	972	974	976	974	970	974	974	974	971	966	963	963	964	966	969	974	977	979	983	981	981	995	985	974
20	985	979	974	971	977	983	984	989	990	985	986	984	986	981	974	974	969	977	987	994	1003	998	996	992	991	984
21	991	996	978	973	979	989	974	974	990	957	960	950	910	945	952	963	954	1021	1003	954	989	955	960	954	979	969
22	979	960	963	944	954	965	955	960	962	963	944	930	942	953	954	957	953	966	964	987	1008	956	968	964	960	960
23	959	934	952	956	964	958	952	954	958	945	915	894	927	949	932	951	968	953	977	995	953	943	962	960	950	950
24	950	963	973	973	963	962	963	955	956	954	948	949	950	953	957	959	963	965	973	976	978	979	970	970	966	963
25	966	964	965	967	968	966	967	963	960	958	957	954	954	958	963	970	978	974	976	980	980	976	972	967	963	967
26	963	965	964	971	974	975	976	971	978	973	966	962	960	969	969	981	983	980	979	977	963	974	978	978	971	972
27	971	979	978	980	969	988	986	986	978	974	961	953	953	962	968	969	972	981	986	990	986	989	1008	966	989	977
28	988	986	972	940	992	963	916	942	949	942	940	917	938	945	943	955	957	962	964	992	968	987	978	982	970	959
Mean†	972	969	967	966	970	974	969	970	969	962	956	950	949	955	958	963	965	971	974	977	977	973	980	973	972	967

†Mean for 26 days only, 17th and 18th omitted.

VI.—TERRESTRIAL MAGNETIC FORCE: WEST COMPONENT.

Eskdalemuir. (—Y.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **February, 1919.**

4,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ*	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	833	863	888	913	901	907	902	909	899	888	890	904	903	906	915	910	881	882	899	889	886	888	890	889	898	894
2	898	888	899	895	886	889	896	899	894	888	883	900	910	916	918	906	902	825	876	886	878	878	878	873	893	890
3	893	872	881	909	909	905	902	899	897	894	899	899	900	897	905	905	904	884	891	899	875	880	879	888	875	894
4	875	894	912	905	894	893	894	895	887	883	887	896	907	926	933	909	889	856	854	888	891	884	876	865	891	892
5	891	872	860	877	906	920	896	899	895	889	897	900	909	904	906	888	899	900	879	858	875	900	895	892	896	892
6	896	888	897	900	889	885	888	894	903	909	910	904	909	905	904	897	891	891	896	899	898	879	872	869	887	895
7	887	888	893	896	898	894	893	893	894	897	899	900	903	909	907	904	902	896	895	897	894	893	893	895	901	897
8	901	899	879	888	892	891	891	889	888	889	894	902	909	911	910	904	899	894	900	900	900	899	898	897	896	897
9	896	897	895	896	897	894	893	893	889	894	900	906	911	914	915	907	904	901	900	889	882	872	880	886	898	896
10	898	894	897	898	898	894	894	891	888	888	893	900	906	915	911	909	904	901	899	898	895	895	894	891	895	898
11	895	898	899	900	895	894	894	893	887	885	889	898	903	908	909	905	903	903	902	899	898	895	896	896	898	898
12	898	899	899	899	897	895	894	893	891	889	895	904	911	917	916	908	904	904	909	904	902	902	902	902	903	902
13	903	903	903	902	899	898	894	898	899	907	913	917	918	930	948	926	934	950	946	921	898	887	847	849	862	907
14	862	858	809	822	860	862	875	885	892	897	894	904	904	904	909	910	893	905	827	808	851	888	886	894	889	876
15	889	899	892	906	894	886	882	883	893	902	915	921	916	915	909	903	895	886	895	892	885	879	883	860	857	894
16	857	862	892	890	897	889	886	888	893	909	905	907	915	900	905	909	902	833	902	904	876	872	860	878	888	889
17	888	890	889	891	894	892	895	903	900	906	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	—
18	*	*	*	*	*	*	*	*	*	*	*	899	907	916	912	899	899	905	883	894	905	895	885	875	885	—
19	885	888	888	888	889	888	889	889	895	900	900	899	899	904	904	904	903	901	902	902	900	899	889	884	883	895
20	883	878	879	874	872	878	887	894	899	909	915	918	926	923	914	915	915	908	909	909	911	905	901	899	878	901
21	878	837	822	833	857	863	855	872	885	888	894	908	895	925	931	922	912	836	813	880	823	857	874	893	925	874
22	926	892	863	866	885	868	882	902	919	911	911	913	916	933	915	916	905	904	899	845	826	880	896	867	795	891
23	795	850	869	884	872	867	878	895	902	904	901	917	919	936	901	908	910	904	879	835	864	863	834	857	866	882
24	866	862	865	878	868	869	873	884	887	890	895	900	905	905	902	898	895	893	895	897	899	902	900	898	889	889
25	889	881	881	881	878	876	876	881	885	885	890	901	910	919	916	904	895	892	895	897	904	906	902	895	885	893
26	885	878	874	869	870	870	874	879	886	885	897	905	919	926	920	910	903	903	908	918	908	902	900	892	888	895
27	888	887	877	856	862	860	868	879	889	888	900	910	912	916	917	910	905	907	910	919	941	946	906	896	879	898
28	879	878	845	851	834	863	903	928	904	891	895	894	901	913	913	911	902	895	864	859	890	881	894	865	925	887
Mean†	883	881	879	884	885	885	887	892	894	895	899	905	909	915	914	908	902	891	891	888	887	890	886	883	886	893

*Clamp left undone, trace for 17th and 18th lost.

†Mean for 26 days only, 17th and 18th omitted.

VII.—TERRESTRIAL MAGNETIC FORCE: VERTICAL COMPONENT.

Eskdalemuir. (Z.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **February, 1919.**

44,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1076	1084	1081	1038	1052	1059	1064	1073	1079	1088	1096	1096	1100	1116	1116	1109	1115	1111	1098	1098	1100	1096	1097	1090	1087	1089
2	1087	1072	1070	1072	1077	1083	1083	1085	1089	1092	1096	1097	1094	1096	1104	1101	1105	1126	1111	1104	1095	1085	1082	1060	1058	1090
3	1058	1071	1079	1076	1071	1079	1084	1085	1087	1089	1091	1092	1096	1103	1104	1102	1105	1113	1108	1100	1100	1088	1087	1080	1073	1090
4	1073	1073	1061	1051	1062	1072	1076	1079	1082	1080	1078	1079	1080	1084	1089	1095	1102	1119	1113	1108	1096	1081	1074	1075	1064	1082
5	1064	1060	1060	1068	1051	1047	1064	1073	1077	1080	1080	1079	1081	1088	1096	1109	1105	1099	1100	1096	1091	1086	1085	1083	1084	1081
6	1083	1084	1083	1069	1073	1079	1081	1080	1078	1078	1080	1083	1086	1089	1091	1089	1090	1091	1091	1088	1088	1091	1088	1081	1079	1084
7	1079	1083	1084	1080	1081	1084	1084	1084	1082	1081	1079	1080	1081	1080	1083	1086	1086	1086	1086	1086	1086	1085	1084	1083	1082	1083
8	1082	1071	1071	1078	1080	1082	1082	1082	1082	1082	1080	1078	1077	1080	1084	1087	1086	1088	1087	1086	1085	1084	1084	1082	1082	1082
9	1082	1082	1082	1082	1081	1080	1081	1082	1081	1079	1074	1074	1073	1076	1082	1083	1082	1084	1086	1089	1087	1094	1094	1088	1082	1082
10	1082	1083	1083	1082	1082	1080	1080	1082	1082	1082	1082	1081	1079	1078	1079	1083	1086	1086	1085	1084	1083	1083	1083	1082	1081	1082
11	1081	1080	1079	1078	1078	1078	1078	1078	1079	1078	1077	1074	1074	1075	1077	1078	1077	1078	1078	1079	1080	1080	1080	1079	1078	1078
12	1078	1077	1078	1077	1077	1076	1076	1077	1078	1078	1077	1075	1074	1073	1073	1073	1074	1076	1076	1076	1077	1076	1076	1076	1076	1076
13	1076	1075	1074	1073	1072	1071	1071	1069	1067	1066	1063	1062	1062	1065	1069	1071	1075	1095	1126	1166	1127	1116	1085	1054	1058	1081
14	1058	1058	1062	1063	1080	1082	1073	1074	1075	1076	1077	1076	1080	1082	1085	1088	1094	1097	1103	1095	1092	1094	1091	1080	1079	1081
15	1079	1066	1066	1070	1071	1075	1077	1076	1073	1070	1068	1069	1073	1079	1082	1086	1088	1089	1086	1088	1090	1095	1082	1079	1078	1078
16	1078	1075	1075	1076	1076	1078	1078	1078	1076	1070	1071	1075	1075	1083	1092	1094	1099	1123	1099	1088	1094	1091	1091	1088	1083	1084
17	1083	1082	1082	1080	1080	1078	1077	1073	1075	1072	1071	1074	1078	1077	1079	1079	1080	1082	1081	1082	1084	1083	1081	1078	1071	1079
18	1071	1071	1076	1077	1077	1076	1076	1074	1071	1071	1073	1074	1072	1073	1079	1086	1085	1084	1088	1086	1085	1090	1087	1091	1088	1079
19	1087	1085	1082	1082	1080	1079	1077	1076	1075	1075	1075	1074	1073	1073	1073	1973	1075	1075	1074	1075	1074	1075	1077	1073	1069	1076
20	1069	1070	1070	1072	1073	1073	1071	1069	1065	1062	1058	1058	1062	1067	1070	1069	1073	1073	1071	1070	1067	1069	1070	1071	1076	1069
21	1075	1080	1080	1072	1057	1040	1050	1061	1061	1064	1065	1063	1072	1075	1081	1106	1112	1137	1110	1125	1108	1085	1084	1057	1016	1079
22	1016	1032	1054	1048	1051	1061	1066	1070	1071	1070	1069	1071	1072	1073	1076	1081	1086	1087	1094	1102	1084	1081	1076	1075	1071	1071
23	1071	1028	1048	1069	1073	1067	1071	1070	1070	1068	1073	1072	1067	1080	1118	1104	1097	1097	1101	1098	1086	1078	1065	1067	1064	1076
24	1064	1050	1047	1045	1049	1061	1067	1071	1074	1076	1077	1076	1073	1074	1076	1078	1080	1080	1079	1077	1076	1076	1076	1076	1079	1070
25	1079	1080	1079	1077	1076	1076	1076	1074	1073	1073	1071	1068	1065	1067	1074	1079	1080	1079	1077	1076	1075	1076	1077	1080	1082	1075
26	1081	1083	1082	1080	1078	1076	1073	1072	1071	1072	1068	1066	1066	1070	1075	1075	1077	1078	1077	1079	1088	1089	1084	1083	1082	1077
27	1082	1077	1074	1070	1064	1051	1043	1047	1052	1056	1058	1057	1056	1058	1061	1068	1070	1071	1070	1070	1079	1128	1201	1127	1111	1075
28	1110	1077	1018	1040	1014	1016	1022	1001	1030	1045	1059	1070	1075	1074	1076	1081	1082	1084	1096	1095	1084	1075	1051	1045	1012	1057
Mean†	1075	1071	1070	1069	1068	1069	1071	1072	1073	1074	1075	1075	1076	1079	1084	1087	1089	1093	1092	1092	1088	1087	1086	1077	1073	1079

† Mean for 26 days only. 17th and 18th omitted.

VIII.—ABSOLUTE OBSERVATIONS; TEMPERATURE OF THE MAGNETOGRAPHS; MAGNETIC CHARACTER FIGURES; NOTES.

Eskdalemuir. **February, 1919.**

Date	Time G.M.T. From	Time G.M.T. To	Horizontal Force.	Declination.	Dip.	Temperature in Magnet House.	Magnetic Character of day (0–2).	Date.
Feb.	h. m.	h. m.	γ	° ′ ″	° ′	a 280+		
						3·1	1D	1
						3·1	1	2
						3·1	1	3
4	11 7	11 36	16685	17 4 44	69 41·4	3·1	1	4
						3·1	1	5
						3·1	0	6
						3·1	0C	7
						3·0	0	8
						3·0	1	9
						3·0	0C	10
11	11 4	11 32	16687	17 3 38	69 41·0	2·9	0C	11
						2·9	0C	12
						2·9	2	13
						2·9	1D	14
						2·8	1	15
						2·7	1	16
						2·7	0	17
						2·7	0	18
19	11 10	12 40	16704	17 3 41	69 40·9	2·6	0	19
						2·6	0	20
						2·6	2D	21
						2·6	2D	22
						2·6	2	23
						2·5	1	24
						2·5	0C	25
						2·5	0	26
27	11 26	11 57	16690	17 6 5	69 41·9	2·5	2	27
						2·4	2D	28

MAGNETIC NOTES.

February, 1919.

The month was one of moderate activity. The most disturbed days were the 13th, 21st, 23rd, 27th, 28th; the quietest, 7th, 10th, 11th, 12th, 25th. A noticeable feature was the frequent occurrence of rapid oscillations in value during the disturbances of the month, particularly during the hours 4 a.m. to 4 p.m. The most considerable disturbance of the month was that which began about 7h. on 20th. The sharp movement on the horizontal traces at that time is a doubtful "sudden commencement." The principal movements took place between 16h. 30m. and 20h. on 21st, and these include a fall in W. of 221 γ in 9 minutes ending 19h. 34m. The prominent V. maximum at 19h. 30m.—the second of two that day—is also notable. The W. traces for the two intervals 22d. 12h. to 23d. 6h., and 23d. 12h. to 24d. 6h. show recognisable "repetitions." A moderate disturbance beginning about 19h. on 27th showed intense oscillatory activity from 4h. to 17h. on 28th. This disturbance was peculiar in showing the maximum development of V. at an unusually late hour. The recovery in V., about 8h. on 28th, was accompanied by short period pulsations.

IX.—TERRESTRIAL MAGNETIC FORCE: NORTH COMPONENT.

Eskdalemuir. (X.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **March, 1919.**

15,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	970	937	953	962	937	961	972	960	961	962	947	930	883	923	951	967	972	966	952	1006	973	955	984	961	963	956
2	963	964	957	953	962	957	964	965	961	960	957	948	922	954	950	932	958	998	964	1025	992	953	998	957	950	963
3	950	950	967	962	967	952	967	958	953	950	932	936	947	956	956	979	971	967	961	991	971	966	972	986	974	962
4	974	971	967	955	967	967	964	951	962	948	950	947	937	945	962	964	986	977	962	978	975	976	982	982	987	965
5	987	972	975	972	977	971	977	973	972	950	937	927	931	943	958	958	963	972	977	981	980	992	986	1022	998	969
6	998	953	942	962	983	990	987	982	978	973	963	954	947	962	975	978	976	980	983	979	957	938	937	924	938	965
7	937	922	968	966	962	970	966	966	966	962	950	937	936	943	952	960	966	969	980	980	976	975	969	971	970	961
8	970	971	968	976	970	977	980	970	971	960	941	931	939	947	959	967	964	957	975	973	972	971	975	977	981	965
9	980	975	976	969	973	973	969	977	980	971	962	950	948	953	963	969	975	969	975	975	979	981	982	983	983	971
10	983	980	981	983	984	986	987	988	984	975	962	955	953	956	960	965	969	971	975	979	980	984	984	984	985	975
11	984	983	987	985	987	988	989	984	993	980	968	962	957	955	960	969	973	980	990	995	993	990	995	996	993	981
12	993	992	987	988	959	980	987	988	979	974	960	954	957	963	965	965	969	956	968	975	990	996	979	980	980	975
13	980	978	977	978	980	982	981	980	975	968	954	951	951	960	965	970	972	979	985	977	970	967	960	997	997	973
14	997	965	963	965	968	982	987	983	979	954	934	930	921	919	929	966	968	973	941	961	963	963	959	963	968	959
15	968	965	965	966	968	969	968	970	966	959	956	950	950	947	947	957	963	964	969	977	975	997	980	968	973	965
16	973	975	995	978	977	979	969	984	962	964	954	943	940	931	941	949	933	965	974	968	973	978	967	973	982	965
17	981	973	969	968	982	993	969	961	953	940	938	919	913	932	949	958	963	968	970	972	974	973	974	974	973	961
18	973	972	970	972	973	977	979	979	974	964	949	937	933	943	951	960	967	972	975	978	982	983	988	982	982	968
19	982	982	979	982	982	982	982	984	982	974	958	942	946	949	967	988	980	998	1012	982	972	963	942	944	935	972
20	935	930	948	923	946	973	934	959	960	946	927	933	923	931	947	974	953	943	953	970	972	958	968	917	956	947
21	955	943	900	928	942	965	957	948	918	903	919	892	897	936	945	964	965	984	1018	971	981	982	976	973	976	949
22	976	959	958	942	953	981	947	957	919	942	893	879	902	945	957	982	947	999	972	968	963	986	944	967	954	951
23	954	964	941	955	964	960	959	922	909	897	894	897	918	930	914	942	952	971	962	972	983	982	966	982	966	946
24	966	966	966	970	971	966	967	966	965	962	948	939	940	942	948	958	967	973	976	981	973	972	968	967	963	963
25	963	968	972	972	976	978	977	976	966	937	937	948	941	937	947	957	962	967	976	976	995	977	976	991	979	966
26	979	976	971	981	972	976	975	974	973	962	946	934	928	934	941	947	962	987	986	981	983	984	981	981	986	967
27	986	991	999	991	987	989	988	987	983	973	958	948	952	967	966	971	983	1040	965	990	971	993	991	986	*985*	981
28	*	*	*	*	*	*	*	*	*	*	928	920	918	932	956	968	987	977	991	991	990	996	985	986	976	—
29	976	971	957	954	976	961	973	974	967	937	933	938	936	942	945	965	976	971	996	984	989	991	978	985	1003	966
30	1003	968	948	966	986	967	964	971	968	962	944	939	941	934	947	976	1006	991	977	966	977	982	976	978	978	968
31	978	979	967	971	955	975	985	957	967	963	951	925	908	936	961	962	972	987	991	983	1003	986	993	1003	976	969
Mean †	976	968	968	969	971	974	974	970	966	957	945	937	934	944	953	963	968	977	973	980	978	977	976	979	977	966

* Burner sooted and trace lost.

† Mean for 27 days only, 19th, 20th, 21st and 28th omitted.

X.—TERRESTRIAL MAGNETIC FORCE: WEST COMPONENT.

Eskdalemuir. (—Y.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **March, 1919.**

4,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	925	910	875	872	878	889	881	892	889	889	894	901	911	927	923	909	897	894	860	816	859	889	875	887	903	889
2	903	900	913	911	899	898	899	897	889	880	881	895	896	907	919	901	902	863	887	841	847	894	817	843	878	886
3	878	901	905	883	886	888	892	892	888	880	883	889	910	919	916	887	849	872	888	863	889	892	892	891	904	889
4	905	890	888	912	894	895	913	954	910	890	886	893	908	913	918	897	902	897	876	874	897	895	882	886	889	899
5	889	898	904	897	895	894	894	890	885	881	894	898	905	936	919	910	898	895	890	895	892	865	877	847	801	892
6	801	821	864	885	887	883	887	885	885	886	893	904	913	919	923	919	913	910	906	900	853	857	909	830	925	887
7	925	824	851	862	866	878	886	891	881	877	885	893	902	909	911	906	901	896	900	900	865	886	886	885	889	885
8	889	888	885	880	885	879	880	886	889	882	889	898	906	912	917	917	908	901	898	882	889	897	896	895	894	894
9	894	893	885	884	883	882	890	890	880	878	885	896	908	917	917	912	903	891	896	900	901	901	899	897	895	895
10	895	895	895	894	893	893	893	891	883	875	876	886	901	912	912	907	901	901	902	902	901	902	899	898	897	896
11	897	896	895	895	891	891	889	902	898	893	895	904	911	914	917	916	910	906	914	917	913	908	898	902	901	903
12	902	897	896	894	898	907	887	891	882	884	891	898	915	926	924	923	921	909	907	903	898	871	871	868	881	898
13	881	893	893	894	891	891	888	883	876	876	886	902	911	918	922	920	913	909	912	912	913	874	881	855	838	895
14	838	868	879	865	888	863	870	880	875	869	886	906	912	935	934	941	935	943	924	892	844	892	863	874	887	892
15	887	881	879	890	891	891	884	881	874	878	*883*	889	899	906	907	908	909	903	902	905	905	891	866	883	887	891
16	887	882	868	855	870	872	890	875	863	879	881	887	919	934	932	934	917	897	890	887	887	892	881	867	859	889
17	859	828	811	850	814	844	877	877	864	865	876	895	899	907	910	904	895	889	888	889	890	890	886	881	883	875
18	883	882	884	885	882	884	883	877	867	863	864	871	886	900	905	903	897	896	894	890	885	890	890	888	886	885
19	886	890	886	886	886	886	884	880	871	865	868	881	902	912	926	938	941	944	949	904	896	874	847	848	856	893
20	856	843	844	826	849	837	861	867	864	860	879	895	915	941	944	925	912	911	879	846	850	859	796	805	853	869
21	853	856	783	787	809	892	866	870	862	864	882	892	891	904	914	915	891	884	872	857	860	849	881	884	860	868
22	860	834	866	849	886	880	874	883	869	890	889	881	896	915	940	918	896	877	873	853	860	880	860	903	889	881
23	889	869	891	874	861	875	873	876	903	897	899	898	905	922	919	912	899	899	880	882	875	874	883	887	881	889
24	881	880	879	877	873	875	876	867	861	860	870	883	897	907	909	906	899	892	888	887	886	887	890	886	876	884
25	876	871	860	857	853	860	871	869	869	864	887	890	899	911	918	923	911	902	896	885	870	875	877	892	872	883
26	872	869	871	857	865	874	876	867	858	854	859	871	895	915	926	922	908	907	899	891	891	894	891	887	891	885
27	891	889	871	882	886	885	881	875	865	861	865	879	905	938	947	933	914	942	911	904	898	890	880	879	893	895
28	894	900	850	857	870	883	914	887	866	872	870	888	898	914	914	907	904	891	870	882	820	848	877	878	879	882
29	879	876	904	901	896	887	887	874	866	858	869	888	908	925	921	914	908	885	887	882	849	861	878	887	889	887
30	889	858	862	899	873	876	882	872	862	860	875	890	914	925	923	928	906	895	891	884	894	881	888	893	930	889
31	930	904	882	868	874	885	878	878	873	866	875	884	903	932	925	930	916	893	901	886	861	882	878	867	866	889
Mean †	885	878	880	880	880	882	884	885	878	875	882	891	905	919	921	915	905	899	895	886	882	886	881	880	885	890

† Mean for 27 days only, 19th, 20th, 21st and 28th omitted.

XI.—TERRESTRIAL MAGNETIC FORCE: VERTICAL COMPONENT.

Eskdalemuir. (Z.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **March, 1919.**

44,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1011	974	1009	1035	1007	1008	1029	1045	1055	1059	1061	1064	1070	1082	1098	1118	1116	1094	1110	1110	1090	1079	1068	1066	1061	1062
2	1061	1054	1041	1038	1049	1050	1058	1058	1061	1066	1063	1061	1066	1080	1090	1096	1102	1119	1099	1077	1053	1064	1049	1038	1037	1066
3	1036	1025	1011	1033	1052	1055	1056	1057	1062	1064	1063	1064	1063	1070	1082	1106	1136	1123	1096	1089	1077	1074	1072	1056	1042	1068
4	1042	1042	1041	1032	1049	1058	1052	1041	1048	1057	1058	1058	1057	1063	1071	1081	1089	1088	1090	1085	1075	1071	1069	1065	1056	1062
5	1056	1057	1045	1056	1059	1061	1060	1061	1063	1060	1054	1054	1056	1059	1064	1073	1076	1077	1074	1070	1071	1070	1061	1046	1018	1061
6	1018	1006	1012	991	1027	1046	1052	1053	1052	1049	1050	1046	1046	1048	1052	1055	1057	1060	1065	1070	1101	1102	1093	1065	1036	1051
7	1035	979	1031	1051	1051	1053	1056	1059	1064	1062	1062	1058	1057	1058	1063	1067	1069	1069	1068	1070	1081	1071	1069	1067	1067	1058
8	1067	1065	1063	1058	1058	1059	1058	1057	1058	1057	1057	1056	1055	1055	1059	1071	1079	1075	1074	1079	1077	1072	1068	1066	1060	1064
9	1060	1057	1054	1056	1059	1060	1059	1059	1062	1060	1055	1051	1050	1048	1052	1058	1068	1075	1070	1066	1064	1062	1062	1061	1060	1060
10	1060	1061	1060	1059	1059	1058	1057	1059	1063	1060	1052	1047	1039	1039	1044	1051	1055	1057	1056	1057	1058	1058	1058	1057	1056	1055
11	1056	1056	1054	1054	1053	1053	1053	1052	1050	1048	1045	1043	1043	1043	1044	1047	1049	1052	1051	1050	1052	1055	1058	1057	1055	1051
12	1054	1055	1054	1051	1049	1033	1035	1038	1044	1044	1042	1044	1043	1044	1050	1057	1067	1077	1076	1072	1066	1061	1055	1055	1055	1053
13	1055	1056	1056	1056	1055	1055	1055	1055	1055	1051	1048	1041	1038	1037	1038	1044	1053	1056	1058	1069	1079	1086	1039	1052	1018	1053
14	1018	1042	1055	1056	1034	1031	1037	1038	1043	1045	1042	1042	1047	1046	1067	1109	1113	1119	1144	1140	1123	1070	1031	1054	1059	1065
15	1058	1058	1056	1055	1057	1057	1058	1058	1057	1057	1053	1052	1049	1046	1051	1057	1063	1065	1065	1061	1062	1061	1053	1056	1058	1057
16	1058	1059	1042	1041	1048	1049	1040	1031	1037	1035	1037	1037	1037	1050	1069	1085	1086	1083	1077	1070	1067	1062	1061	1063	1062	1055
17	1061	1037	1036	1002	985	986	1000	1016	1037	1049	1053	1051	1053	1053	1053	1057	1059	1059	1056	1055	1055	1056	1056	1057	1056	1041
18	1056	1056	1056	1056	1055	1054	1053	1056	1056	1056	1056	1052	1049	1047	1049	1052	1055	1056	1055	1053	1053	1052	1052	1049	1049	1053
19	1049	1049	1051	1052	1052	1052	1051	1053	1055	1053	1046	1042	1040	1040	1040	1041	1053	1076	1107	1142	1118	*	*	*	*	—
20	*	*	*	*	*	*	*	*	*	*	1044	1046	1052	1063	1081	1109	1111	1112	*	*	*	*	*	*	*	—
21	*	*	*	*	*	*	*	*	*	*	1057	*	*	1074	1072	1077	1091	1108	1097	1084	1060	1046	1040	995	984	—
22	984	979	976	983	1000	1000	1024	1036	1050	1051	1048	1053	1079	1116	1123	1139	1123	1119	1105	1099	1075	1033	1036	1032	1013	1053
23	1013	1012	989	988	1021	1037	1044	1045	1045	1044	1045	1049	1058	1059	1069	1074	1065	1068	1075	1070	1065	1055	1053	1049	1049	1046
24	1048	1051	1053	1051	1049	1051	1052	1055	1054	1049	1041	1039	1040	1040	1046	1052	1056	1058	1060	1060	1062	1061	1060	1060	1061	1052
25	1061	1060	1057	1055	1051	1046	1042	1043	1043	1041	1038	1040	1038	1039	1041	1048	1060	1065	1069	1071	1070	1060	1060	1043	1035	1051
26	1034	1035	1027	1025	1035	1042	1046	1051	1052	1050	1045	1042	1034	1034	1038	1043	1047	1051	1057	1062	1060	1054	1053	1051	1046	1045
27	1046	1032	1031	1036	1040	1040	1042	1044	1044	1042	1037	1034	1029	1025	1028	1032	1035	1051	1091	1091	1084	1063	1046	1034	989	1044
28	989	<923	969	999	1021	1024	1011	1019	1033	1039	1042	1038	1042	1045	1054	1059	1059	1062	1068	1066	1074	1054	1038	1017	1025	<1032
29	1025	1030	1014	1018	1014	1019	1030	1041	1046	1046	1044	1039	1034	1038	1045	1049	1055	1065	1067	1063	1066	1054	1044	1031	1002	1040
30	1002	991	981	987	1010	1023	1031	1038	1044	1042	1038	1035	1030	1029	1034	1050	1079	1092	1092	1086	1063	1048	1044	1042	1016	1038
31	1016	991	987	993	1001	1012	1020	1029	1033	1034	1034	1030	1029	1028	1048	1051	1050	1057	1047	1049	1047	1038	1032	1022	1021	1028
Mean†	1040	1034	1033	1034	1038	1041	1044	1047	1051	1051	1049	1047	1048	1051	1058	1067	1073	1075	1076	1074	1070	1063	1056	1052	1042	1053

XII.—AUXILIARY OBSERVATIONS IN ABSOLUTE MEASURE; DAILY VALUES OF TEMPERATURE IN THE EAST ROOM OF MAGNET HOUSE; MAGNETIC NOTES FOR MONTHS.

Eskdalemuir. **March, 1919.**

Date	Time G.M.T. From	Time G.M.T. To	Horizontal Force.	Declination.	Dip.	Temperature in Magnet House.	Magnetic Character of day (0–2).	Date.
Mar.	h. m.	h. m.	γ	° ′ ″	° ′	a		
						280+		
						2·4	2D	1
						2·4	2D	2
						2·4	1	3
						2·3	1	4
5	11 10	11 56	16665	17 7 24	69 42·4	2·3	1	5
						2·3	1	6
						2·3	1	7
						2·3	0C	8
						2·3	0C	9
10	11 46	12 14	16688	17 4 26	69 40·0	2·3	0C	10
						2·2	0	11
12	11 19	12 6	16698	17 8 42	69 40·1	2·1	1	12
13	10 32	11 38	16687	17 7 58	69 40·1	2·1	1	13
						2·1	1	14
						2·1	1	15
						2·1	1	16
						2·1	1	17
						2·1	0C	18
19	10 44	11 12	16666	17 1 55	69 41·4	2·1	2	19
						2·0	2D	20
						2·0	2D	21
						2·0	2D	22
						2·0	1	23
24	11 25	11 50	16678	17 3 19	69 41·1	1·9	0C	24
						1·9	1	25
26	15 25	15 53			69 40·0	1·9	1	26
						1·8	1	27
						1·8	2	28
						1·8	1	29
						1·7	1	30
						1·6	1	31

MAGNETIC NOTES.

March, 1919.

The month was one of frequent though not very large disturbance, there being only six days to which the lowest character figure could be assigned. The most disturbed days were 2nd, 20th, 21st, 22nd, 28th; the quietest, 9th, 10th, 11th, 18th, and 24th. The disturbance in progress at the beginning of the month did not die down until the early morning hours of the 7th. Another began with a sudden commencement at 11d. 17h. 54m., but the subsequent movements were slight. The most considerable storm was that beginning soon after 18h. on 19th and ending about 24h. on 23rd. The maximum value of N. (16111 γ) occurred at 21d. 17h. 54m. as the peak of a projection superposed on the general disturbance; the minimum on N. (15809 γ) at 20d. 22h. 37m. during a series of rapid swings in one of which the value fell and rose by 229 γ in 21 minutes. The last four days of the month were also disturbed, and at this time there was considerable oscillatory activity during the sunlit hours. V. showed a sharp minimum about 28d. oh. 50m. The V. traces for the two periods of 24 hours each, ending at 8h. on 31st showed considerable similarity.

* Burner sooted and light became dim.

† Mean for 27 days only, 19th, 20th, 21st, and 28th omitted.

XIII.—TERRESTRIAL MAGNETIC FORCE: NORTH COMPONENT.

Eskdalemuir. (X.) *Mean Values for Periods of* 60 *Minutes centred at the Hours of Greenwich Mean Time.* **April, 1919.**

15,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	976	976	978	985	984	985	977	977	977	962	948	924	939	953	960	968	978	968	977	989	993	1013	983	984	984	973
2	984	984	985	980	987	992	991	995	984	973	953	938	937	943	948	961	972	981	989	991	992	988	989	988	988	976
3	988	989	988	989	988	987	992	993	987	972	953	944	937	942	948	967	967	983	994	997	1002	1000	1000	999	999	980
4	999	1004	1010	1003	1002	1004	1003	982	963	958	948	929	924	917	930	946	955	976	986	988	985	983	983	983	983	973
5	983	986	982	985	987	987	984	989	986	972	953	941	937	941	953	965	975	983	988	990	997	994	992	992	992	977
6	993	993	992	991	993	990	992	995	996	965	940	928	937	940	950	960	999	966	995	1004	1000	1002	1004	1008	1019	981
7	1019	973	971	958	1004	992	957	928	945	960	951	944	944	954	961	967	981	984	988	987	993	977	953	1000	983	966
8	983	963	978	983	997	1001	976	978	980	943	914	894	940	955	973	974	979	974	986	990	989	994	1007	978	975	972
9	975	985	975	989	984	968	978	986	979	964	940	926	930	945	954	953	973	983	989	991	1010	983	976	971	970	971
10	970	994	999	963	978	970	968	963	974	963	952	940	931	939	958	963	978	998	1004	988	976	985	998	991	986	973
11	987	989	987	980	975	981	982	981	981	963	955	948	945	955	964	971	975	980	998	989	981	988	989	987	992	976
12	992	984	983	980	986	988	985	977	968	967	960	960	956	953	955	962	964	975	986	984	989	988	989	985	994	976
13	994	999	1004	990	988	989	989	989	986	976	955	949	951	957	959	961	971	989	995	999	1007	995	995	995	997	983
14	997	994	992	993	990	990	994	994	986	974	959	950	942	949	959	969	984	994	1003	1000	1005	999	999	999	998	984
15	999	997	997	998	998	996	995	994	988	975	962	950	950	960	963	975	986	995	1006	1015	1010	1015	1011	1003	995	989
16	995	992	994	1000	1002	998	999	1001	1001	994	976	970	967	975	977	980	990	980	999	1006	1000	976	975	956	955	987
17	956	986	976	979	931	987	983	965	947	912	900	896	921	962	952	949	1011	1035	1001	1029	1025	1017	942	987	951	969
18	951	962	951	965	925	986	967	936	971	962	946	929	933	941	962	970	1012	1021	996	991	982	990	979	973	974	967
19	974	976	963	961	984	966	971	977	971	961	947	917	941	952	972	976	983	985	986	989	991	979	983	990	1009	971
20	1010	969	978	982	968	982	986	979	977	977	963	950	945	946	963	974	1001	993	997	998	987	972	961	967	987	976
21	987	973	967	984	995	982	989	982	977	948	928	922	932	952	968	973	982	998	1004	1001	1002	1002	987	987	986	976
22	986	984	983	1001	1009	967	983	977	966	964	950	928	937	953	967	956	973	996	996	1002	1005	1011	998	1017	972	979
23	973	981	988	982	954	978	983	979	975	964	950	946	940	939	955	960	980	992	999	1002	998	1000	998	997	997	976
24	997	989	982	983	981	981	985	991	990	986	976	968	955	961	969	968	981	998	1011	999	1008	997	995	997	993	985
25	994	994	994	990	987	999	994	1000	1002	993	980	970	962	956	969	981	981	996	1003	1006	1002	999	995	997	996	989
26	996	996	993	991	990	990	991	993	989	982	970	966	961	958	969	976	984	993	1005	1005	998	995	995	994	994	987
27	995	999	1000	1001	994	990	988	990	989	984	980	971	970	976	977	991	985	989	1005	1017	1004	1002	1003	1004	1002	992
28	1002	994	996	999	1000	1005	1002	1001	998	990	980	976	970	975	978	986	992	1002	1018	1002	1000	1002	1000	999	1000	994
29	1001	997	997	996	993	988	995	1000	994	988	976	972	968	963	977	1000	1031	1033	1023	1016	993	997	998	1000	1005	996
30	1005	1003	1003	997	997	996	991	986	976	981	961	949	968	965	972	981	990	997	1001	1004	1007	1007	1008	997	996	989
Mean †	988	987	987	987	984	987	987	984	981	969	954	943	946	953	962	970	984	991	998	999	998	996	991	991	989	980

†Mean for 29 days only, 7th omitted.

XIV.—TERRESTRIAL MAGNETIC FORCE: WEST COMPONENT.

Eskdalemuir. (—Y.) *Mean Values for Periods of* 60 *Minutes centred at the Hours of Greenwich Mean Time.* **April, 1919.**

4,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	866	883	888	888	887	887	886	882	875	869	877	888	907	921	922	914	906	894	889	890	867	861	884	888	888	889
2	888	890	895	895	887	882	881	873	862	855	866	890	914	924	926	919	909	900	896	892	892	888	888	888	891	892
3	891	890	889	888	887	887	887	881	867	863	866	880	900	918	925	930	909	910	908	902	903	898	896	892	889	894
4	889	890	889	887	891	915	910	907	877	878	874	875	884	899	909	909	902	898	894	892	890	889	889	884	885	892
5	886	884	884	884	888	890	894	881	870	864	862	869	885	903	914	916	916	912	905	899	900	898	889	888	888	891
6	888	888	885	888	891	890	892	883	873	877	885	898	911	933	935	926	936	905	905	904	900	899	898	866	780	896
7	780	824	818	881	890	905	893	886	910	896	889	890	900	911	916	904	902	897	893	891	899	861	784	850	807	878
8	807	840	838	846	861	879	864	855	861	860	876	886	920	922	925	911	905	899	889	893	884	863	886	876	876	878
9	876	882	869	869	859	869	892	879	870	863	871	882	896	918	927	913	907	906	899	895	899	867	851	853	851	883
10	851	867	841	854	878	873	868	873	870	869	868	862	897	905	916	908	903	895	890	884	881	888	883	846	880	879
11	881	885	876	863	868	874	874	873	868	869	881	897	916	927	932	932	926	910	893	890	890	891	884	883	881	891
12	881	868	861	862	868	868	867	863	868	871	878	892	914	933	949	953	943	926	912	895	879	885	890	886	884	892
13	884	875	856	868	877	877	875	870	862	858	864	877	889	903	910	908	907	910	905	901	905	880	889	888	893	885
14	893	890	889	884	879	882	879	875	869	868	877	889	902	916	920	915	910	902	898	894	898	896	894	894	894	892
15	894	891	890	889	885	882	878	871	862	860	869	885	905	921	920	913	911	906	906	909	906	901	881	864	883	891
16	884	884	876	872	873	872	872	864	873	874	877	886	909	935	957	960	952	928	910	895	857	828	838	842	846	887
17	846	848	860	842	864	853	850	840	858	849	890	905	925	920	914	940	902	877	902	838	867	840	860	858	876	873
18	876	887	907	890	879	872	872	890	873	870	874	879	900	916	928	928	917	919	910	904	883	842	853	871	885	889
19	885	887	895	884	853	869	876	872	869	867	875	878	901	912	917	910	902	897	892	879	871	887	891	883	854	885
20	854	865	856	853	865	875	872	868	862	863	869	879	898	906	906	902	910	894	891	892	880	825	817	857	864	874
21	864	882	897	870	865	859	864	858	861	853	873	890	905	912	919	917	912	910	908	895	864	868	878	869	846	883
22	846	853	857	860	852	854	869	872	864	865	880	892	899	905	922	908	907	909	897	893	890	884	854	842	851	878
23	851	863	875	864	876	873	858	863	862	862	876	897	912	923	924	926	918	914	905	887	895	900	896	892	893	889
24	893	890	891	891	885	882	878	873	870	869	873	882	897	905	917	910	902	906	905	881	870	884	891	895	890	889
25	891	892	887	889	884	885	880	880	885	881	885	887	895	898	900	902	902	908	902	899	899	897	897	896	896	893
26	896	894	890	886	880	873	870	869	866	871	874	880	891	904	915	910	901	899	896	896	895	896	896	893	892	889
27	892	895	902	879	870	865	861	859	862	869	879	886	900	914	913	913	907	899	899	902	898	891	884	883	886	888
28	886	882	888	880	880	875	870	870	872	875	883	892	899	907	910	907	901	900	901	892	896	899	897	896	894	890
29	894	894	892	890	884	888	879	873	872	879	882	891	902	913	915	914	907	911	900	884	879	891	895	893	893	892
30	893	896	876	871	877	870	865	870	881	881	886	894	915	923	922	910	908	908	902	898	888	881	869	886	892	890
Mean †	877	881	879	875	876	877	875	872	868	867	876	886	903	915	921	918	912	905	900	892	887	880	880	878	877	887

†Mean for 29 days only, 7th omitted.

XV.—TERRESTRIAL MAGNETIC FORCE: VERTICAL COMPONENT.

Eskdalemuir. (Z.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **April, 1919.**

44,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1021	1027	1031	1031	1032	1032	1032	1032	1031	1030	1023	1018	1010	1010	1018	1026	1034	1039	1038	1038	1040	1034	1029	1030	1031	1029
2	1031	1031	1030	1025	1026	1026	1028	1031	1031	1029	1023	1014	1012	1018	1026	1029	1031	1033	1034	1033	1032	1032	1032	1031	1031	1028
3	1031	1030	1030	1031	1030	1030	1030	1031	1030	1026	1021	1017	1013	1014	1018	1026	1034	1034	1032	1030	1028	1028	1028	1027	1027	1027
4	1026	1026	1025	1025	1025	1017	1008	1009	1013	1013	1014	1013	1016	1020	1025	1033	1036	1035	1034	1032	1030	1029	1029	1028	1028	1023
5	1028	1027	1028	1028	1028	1027	1026	1029	1028	1026	1023	1018	1013	1009	1012	1017	1022	1025	1027	1028	1027	1028	1029	1029	1027	1024
6	1027	1026	1025	1025	1024	1024	1024	1026	1022	1018	1013	1010	1004	1006	1012	1020	1032	1049	1040	1034	1031	1029	1025	1021	1004	1023
7	1004	964	956	<929	<923	940	969	992	994	1001	1010	1018	1016	1014	1017	1023	1027	1032	1033	1033	1032	1038	1005	947	953	<996
8	952	916	902	932	952	950	965	992	999	1006	1012	1016	1074	1074	1076	1084	1091	1095	1101	1104	1103	1099	1069	1062	1070	1029
9	1070	1064	1060	1061	1059	1060	1052	1057	1067	1072	1073	1072	1070	1069	1080	1093	1092	1092	1095	1101	1097	1084	1088	1077	1067	1075
10	1067	1050	1045	1057	1054	1064	1069	1074	1075	1076	1078	1078	1076	1073	1077	1083	1085	1096	1108	1114	1112	1102	1084	1079	1080	1078
11	1080	1078	1078	1073	1072	1075	1077	1080	1080	1079	1074	1070	1070	1075	1086	1094	1102	1105	1112	1109	1100	1096	1091	1090	1084	1085
12	1083	1075	1067	1065	1067	1072	1074	1073	1071	1065	1063	1059	1054	1059	1070	1088	1089	1131	1136	1138	1128	1115	1104	1097	1091	1085
13	1091	1083	1072	1079	1081	1081	1082	1082	1079	1075	1071	1065	1060	1060	1063	1067	1070	1073	1078	1079	1079	1089	1087	1085	1082	1076
14	1082	1081	1080	1080	1079	1077	1074	1073	1071	1068	1063	1055	1051	1051	1058	1063	1067	1071	1075	1075	1074	1075	1076	1075	1076	1071
15	1075	1076	1076	1076	1075	1075	1075	1078	1076	1070	1063	1058	1058	1058	1066	1068	1070	1070	1070	1070	1071	1074	1076	1074	1074	1071
16	1074	1076	1078	1079	1077	1075	1072	1070	1067	1064	1063	1058	1051	1055	1071	1098	1117	1135	1122	1108	1102	1087	1077	1048	1031	1079
17	1031	1042	1050	1056	1026	1023	1034	1047	1050	1057	1062	1076	1082	1131	1126	1127	1169	1176	1146	1151	1086	1042	1028	1011	998	1076
18	998	998	1024	1042	994	975	1018	1031	1044	1057	1067	1072	1073	1078	1085	1091	1122	1138	1135	1118	1104	1095	1079	1080	1082	1065
19	1082	1082	1070	1031	1046	1065	1067	1067	1069	1070	1075	1080	1082	1080	1083	1086	1087	1089	1091	1097	1097	1091	1088	1084	1066	1077
20	1065	1053	1049	1054	1057	1064	1070	1075	1077	1077	1075	1073	1070	1073	1077	1080	1086	1101	1105	1104	1109	1093	1067	1062	1067	1076
21	1067	1055	1037	1048	1053	1055	1064	1070	1070	1069	1070	1073	1071	1077	1084	1086	1090	1096	1103	1107	1109	1089	1088	1080	1057	1075
22	1056	1054	1060	1051	1032	1048	1051	1056	1057	1060	1060	1061	1065	1066	1076	1084	1082	1083	1086	1086	1086	1082	1077	1042	1009	1064
23	1009	1027	1056	1063	1036	1036	1057	1066	1069	1070	1068	1063	1056	1057	1068	1076	1081	1084	1086	1090	1088	1083	1081	1081	1079	1066
24	1079	1079	1080	1076	1076	1074	1073	1074	1074	1070	1069	1065	1061	1068	1076	1082	1094	1101	1102	1104	1099	1088	1084	1082	1081	1080
25	1081	1079	1077	1077	1079	1076	1075	1075	1072	1073	1072	1072	1071	1073	1078	1080	1085	1087	1088	1088	1087	1084	1082	1080	1080	1079
26	1079	1077	1079	1079	1080	1081	1079	1078	1075	1072	1069	1067	1063	1060	1068	1075	1078	1079	1080	1081	1083	1082	1082	1081	1081	1076
27	1081	1079	1076	1075	1079	1080	1079	1077	1075	1072	1067	1064	1058	1056	1061	1065	1072	1077	1081	1081	1086	1085	1079	1070	1064	1074
28	1064	1068	1073	1076	1077	1078	1078	1075	1073	1068	1067	1062	1059	1056	1059	1066	1071	1075	1083	1089	1085	1081	1080	1079	1077	1073
29	1076	1076	1076	1077	1078	1074	1068	1065	1063	1058	1055	1052	1046	1046	1055	1070	1082	1099	1107	1110	1103	1090	1083	1078	1075	1074
30	1075	1057	1060	1066	1071	1075	1077	1069	1064	1060	1060	1058	1054	1058	1067	1070	1073	1076	1078	1079	1081	1082	1080	1074	1074	1069
Mean†	1055	1051	1052	1053	1051	1051	1054	1057	1058	1057	1056	1054	1053	1056	1063	1070	1077	1084	1085	1085	1081	1075	1069	1063	1058	1063

†Mean for 28 days only, 7th omitted. On 7th from 3hr.—3hr. 50m. trace off sheet during magnetic disturbance.

XVI.—AUXILIARY OBSERVATIONS IN ABSOLUTE MEASURE; DAILY VALUES OF TEMPERATURE IN THE EAST ROOM OF MAGNET HOUSE; MAGNETIC NOTES FOR THE MONTH.

Eskdalemuir. **April, 1919.**

Date	Time G.M.T. From	Time G.M.T. To	Horizontal Force.	Declination.	Dip.	Temperature in Magnet House. a 280+	Magnetic Character of day (0–2).	Date.
April	h. m.	h. m.	γ	° ′ ″	° ′			
1	14 23	15 2	16702	17 7 18	69 39·3	1·7	1	1
2	10 31	11 0	16704	17 2 50	69 41·2	1·7	0	2
						1·6	0C	3
4	14 55	15 11			69 41·1	1·6	1	4
5	10 38	10 54			69 41·6	1·6	0C	5
						1·6	1	6
						1·6	2D	7
						1·5	2D	8
9	11 25	11 49	16675	17 4 10	69 42·8	1·6	1	9
10	13 39	14 15	16706	17 11 14	69 40·0	1·6	1	10
11	10 31	10 43			69 40·8	1·6	1	11
12	10 33	10 45			69 40·1	1·6	0	12
						1·5	0	13
						1·5	0C	14
15	11 28	11 55	16684	17 5 27	69 40·8	1·6	1	15
						1·7	1D	16
						1·7	2D	17
						1·7	2D	18
						1·7	1	19
						1·8	1	20
						1·8	1	21
22	10 23	10 56	16673	17 5 36	69 41·2	1·8	1	22
						1·8	1	23
24	11 38	12 11	16688	17 4 25	69 40·1	1·8	1	24
						1·8	0	25
						1·8	0C	26
						1·9	0	27
						1·9	0C	28
						1·9	1	29
						1·9	1	30

MAGNETIC NOTES.

April, 1919.

The month showed only two disturbed periods, those beginning on the 6th and 16th. The former began with a rather feebly marked sudden commencement at 6d. 7h. 55m., but no considerable movement followed immediately. At 22h. 10m. on same day, another movement of the "sudden commencement" type, but very slow, occurred and this was followed by large movements on all three components. About 22½h. on 7th, a series of large oscillations are shown on N., the largest of which had a range of 219γ. Similar large movements, accompanied by well marked pulsations of short period, occurred on W. at same time. The second disturbance referred to began soon after 12h. on 16th and continued with diminishing intensity and with occasional intermissions for about 10 days. One of its prominent features was an inverted bay on N. centering about 3h. 45m. on 17th and repeated about 24 hours later. Sharp movements resembling "sudden commencements" occurred at 18d. 18h. 53m. and 19d. 20h. 29m. The V. trace from 17d. 12h. to 18d. 8h. shows three maxima and three minima, the drop from the last maximum being at an earlier hour (18½) than usual, and the lowest and last minimum being as late as 4½h.

XVII.—TERRESTRIAL MAGNETIC FORCE: NORTH COMPONENT.

Eskdalemuir. (X.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **May, 1919.**

15,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	997	1006	1001	992	994	996	996	994	987	982	972	966	964	971	980	970	991	998	1000	1007	1006	1002	1002	1028	1027	992
2	1027	1013	1012	954	997	991	967	978	976	977	956	934	942	973	991	986	1031	1060	1045	1035	990	986	971	976	987	990
3	988	966	983	884	942	854	879	826	814	795	842	903	922	937	943	943	979	992	989	997	1005	1007	986	972	972	931
4	972	965	967	971	972	976	974	969	972	967	957	946	942	954	959	972	988	998	992	997	1013	992	975	982	985	974
5	986	979	990	983	969	979	963	988	969	956	945	927	940	944	944	959	993	998	1019	1017	1009	980	988	983	978	975
6	978	980	969	965	974	988	992	989	989	977	956	945	944	939	959	970	985	1005	1008	1022	1001	998	987	990	980	980
7	981	984	988	983	980	989	989	984	990	989	979	966	955	948	949	960	974	987	1001	1005	1011	1002	994	994	990	983
8	990	990	989	989	990	993	995	997	994	985	976	974	969	961	962	965	975	994	1004	1015	1012	1009	1006	1005	1003	989
9	1004	1000	990	992	997	998	999	993	992	985	972	965	962	966	976	982	993	1005	1015	1026	1015	1010	1010	1022	1004	995
10	1004	1000	998	998	997	995	988	986	995	993	975	962	959	970	986	986	981	992	1015	1016	1010	1003	1001	1000	1000	992
11	1001	1001	1000	999	999	997	993	990	981	972	965	963	970	981	987	997	998	1006	1010	1013	1009	1006	1011	1013	1011	994
12	1011	1010	1011	1007	1006	1003	1001	997	999	996	987	974	976	975	992	993	1000	1011	1016	1012	1016	1016	1021	996	998	1001
13	999	1007	1010	1018	996	950	987	953	954	954	933	947	957	973	978	1021	1035	1044	1086	1031	992	993	974	996	982	991
14	982	942	992	993	988	972	971	968	967	957	914	927	967	962	972	970	987	1016	1015	1031	1028	1016	1003	980	992	980
15	993	979	988	974	990	960	983	972	963	949	943	957	954	955	968	985	995	999	1020	1024	1015	1007	1003	1000	999	982
16	999	999	991	999	980	992	989	983	978	971	959	949	945	943	978	985	1005	1008	1011	1021	1033	1013	1002	999	1001	989
17	1002	989	1008	1002	999	998	994	981	967	958	959	960	976	973	999	1009	998	1029	1028	1039	1025	989	981	952	978	992
18	978	988	989	974	992	969	970	971	963	915	901	925	926	936	951	978	1000	1022	1005	1009	1010	1015	999	994	993	974
19	994	995	996	997	998	996	991	979	975	968	951	941	942	961	979	1019	1016	1015	996	1004	995	1006	1007	999	997	988
20	998	1002	1007	1012	1034	1000	985	980	972	960	952	941	940	956	973	993	1006	1008	998	1016	1025	1006	997	1000	1001	990
21	1001	986	1002	1005	993	977	982	996	981	986	977	964	962	977	1006	1001	996	1032	1087	1029	1023	1021	1011	993	988	999
22	989	1017	1022	1024	1019	992	989	988	986	976	968	963	969	971	981	987	999	999	1014	1022	1036	1033	1009	943	929	994
23	929	978	977	977	979	981	977	972	967	967	958	955	950	964	948	991	1010	1001	1002	1003	1003	1001	1001	1006	1008	981
24	1009	1007	1003	1007	992	988	989	964	930	925	944	956	944	965	987	1002	1060	1112	1081	1039	1022	984	970	965	934	992
25	934	975	982	989	1000	973	982	984	974	974	979	969	939	959	965	979	1003	1003	1018	1028	1019	1013	1005	1005	1000	987
26	1001	994	999	996	1001	1004	1004	998	978	952	948	944	926	927	954	991	1000	1025	1065	1026	1019	1001	995	994	985	989
27	986	996	999	999	990	976	995	998	990	985	971	946	937	960	971	989	990	1010	1014	1013	1015	1005	1000	998	999	989
28	999	999	998	1000	1003	1006	1002	990	984	981	973	977	980	984	978	1000	1016	1008	1025	1026	1017	1009	1007	1010	1010	999
29	1011	1005	1002	1005	1003	1006	1010	1008	1004	993	981	969	969	972	982	1002	1014	1010	1017	1000	1006	1006	1009	1011	1010	1000
30	1010	1010	1008	1010	1012	1016	1016	1013	1007	995	982	972	970	974	986	1001	988	1011	1033	1032	1020	1023	1018	1018	1015	1005
31	1016	1018	1016	1018	1012	1002	1003	1002	997	981	973	968	968	970	984	993	1017	1027	1028	1027	1025	1019	1017	1017	1017	1004
Mean	993	993	996	991	993	984	986	980	974	965	956	953	954	961	973	986	1001	1014	1021	1019	1014	1006	999	995	993	988

XVIII.—TERRESTRIAL MAGNETIC FORCE: WEST COMPONENT.

Eskdalemuir. (—Y.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **May, 1919.**

4,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	892	884	876	882	880	875	872	872	873	876	883	896	902	909	916	909	907	906	901	902	901	898	897	903	886	892
2	886	881	898	957	827	864	862	894	871	864	876	885	906	923	950	920	942	958	909	913	894	869	856	876	871	895
3	871	832	746	742	768	861	883	891	875	904	911	891	897	907	923	912	912	902	907	902	901	915	912	864	860	876
4	860	849	858	854	867	863	864	861	863	862	859	869	881	897	905	918	926	920	897	906	885	839	851	842	859	875
5	859	848	831	833	823	835	858	871	859	872	886	886	901	912	912	907	907	901	905	882	874	886	864	880	864	875
6	865	856	864	867	870	866	862	860	865	856	858	865	871	888	896	898	897	897	894	887	886	875	870	874	877	875
7	877	875	876	872	871	870	861	856	860	867	870	872	886	898	902	899	901	902	903	899	897	881	881	878	880	881
8	880	879	878	875	874	873	866	859	855	860	870	880	892	900	903	903	903	905	903	900	897	897	892	882	878	884
9	878	883	882	875	857	857	855	857	858	864	880	889	900	909	913	905	905	910	909	911	908	900	901	899	868	888
10	868	877	874	875	876	881	892	897	904	897	897	911	923	917	919	920	911	908	906	908	903	901	898	895	893	899
11	893	893	889	888	883	876	871	869	867	871	877	892	905	910	908	906	901	902	901	901	901	899	900	877	892	891
12	892	888	885	881	877	871	866	862	865	867	880	892	919	930	935	925	915	909	901	902	903	905	903	893	883	894
13	883	870	861	869	860	910	902	856	839	847	860	887	911	935	925	930	936	919	934	913	865	870	855	866	855	887
14	855	843	860	872	869	865	864	863	854	846	847	887	912	926	917	909	912	914	902	893	907	868	855	872	878	880
15	878	860	881	876	873	886	880	871	855	849	860	877	893	904	907	908	910	904	905	891	892	890	892	897	889	885
16	889	886	891	892	865	862	844	841	847	854	864	881	900	920	926	912	909	903	902	903	903	888	889	889	887	886
17	887	895	890	875	872	866	859	849	848	856	875	892	914	920	941	941	928	934	917	917	865	851	847	855	850	886
18	850	850	860	854	865	858	886	875	853	847	876	900	919	926	920	913	912	909	893	893	896	886	884	888	886	885
19	886	884	884	881	875	866	852	840	850	859	876	892	907	921	930	935	920	913	892	897	897	901	880	877	876	888
20	876	870	857	836	829	837	849	846	844	853	865	886	903	913	917	919	915	902	892	893	874	880	888	891	887	877
21	887	902	873	863	855	854	855	832	922	844	872	890	908	919	933	935	927	930	936	924	908	880	866	860	865	890
22	865	885	860	856	857	869	875	873	867	868	876	888	905	910	915	910	908	902	906	904	890	866	862	841	869	882
23	869	869	870	871	870	864	857	854	859	868	873	880	896	912	902	903	904	893	889	887	888	888	890	897	890	882
24	890	889	897	889	902	919	887	871	859	877	897	899	900	902	910	922	941	931	920	898	879	865	848	871	879	894
25	879	849	854	850	849	854	872	862	846	856	868	881	892	916	928	926	928	903	904	903	898	893	887	888	882	883
26	882	882	873	865	860	859	860	859	855	849	859	872	894	916	923	944	928	936	950	927	897	872	869	870	872	887
27	872	873	889	897	914	910	876	855	844	844	850	865	885	900	905	907	897	896	892	888	889	888	890	889	886	884
28	886	886	882	881	871	863	858	855	856	862	873	882	890	904	903	902	902	897	897	894	892	894	896	892	886	884
29	886	883	887	884	886	885	865	859	850	854	864	878	898	916	926	925	917	903	895	891	893	892	892	892	892	889
30	892	888	886	881	874	865	857	850	849	851	860	872	887	907	920	919	907	903	899	902	902	900	900	903	898	887
31	899	884	885	884	877	888	873	865	855	859	871	886	903	914	920	917	914	911	904	898	896	895	888	890	892	891
Mean	878	874	871	870	864	870	867	862	860	861	872	885	900	912	918	916	914	910	905	901	893	885	881	880	878	885

XIX.—TERRESTRIAL MAGNETIC FORCE: VERTICAL COMPONENT.

Eskdalemuir. (Z.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **May, 1919.**

44,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1074	1071	1074	1076	1078	1078	1075	1074	1073	1068	1069	1066	1062	1060	1067	1073	1075	1081	1082	1081	1079	1077	1077	1070	1066	1073
2	1066	1071	1069	1018	962	1002	1035	1044	1054	1059	1062	1069	1062	1065	1077	1143	1163	1206	1204	1171	1130	1054	1038	1071	1075	1079
3	1075	987	922	857	853	879	894	945	986	920	1040	1062	1083	1091	1103	1106	1119	1119	1102	1102	1105	1086	1042	1066	1066	1022
4	1066	1072	1075	1078	1083	1083	1083	1083	1081	1081	1080	1077	1074	1077	1083	1085	1091	1103	1117	1103	1102	1087	1077	1076	1078	1084
5	1078	1074	1046	1002	1015	1028	1029	1035	1051	1054	1053	1057	1063	1079	1089	1091	1090	1091	1091	1107	1110	1084	1083	1058	1033	1064
6	1033	1058	1058	1051	1047	1062	1066	1066	1066	1061	1059	1061	1059	1063	1078	1090	1087	1091	1094	1099	1101	1094	1086	1082	1074	1072
7	1074	1077	1079	1079	1074	1071	1071	1072	1069	1066	1063	1063	1065	1071	1075	1077	1080	1082	1084	1086	1086	1091	1093	1086	1084	1077
8	1084	1083	1082	1082	1082	1082	1083	1080	1076	1070	1064	1059	1054	1058	1062	1068	1074	1079	1080	1082	1083	1083	1083	1083	1078	1076
9	1078	1075	1073	1073	1075	1075	1074	1069	1068	1066	1065	1060	1061	1066	1070	1073	1075	1077	1079	1082	1082	1082	1078	1072	1073
10	1072	1075	1077	1078	1079	1077	1070	1065	1062	1060	1059	1058	1058	1065	1074	1082	1090	1091	1091	1087	1085	1083	1082	1081	1081	1075
11	1081	1081	1081	1082	1082	1082	1081	1079	1078	1075	1066	1059	1060	1062	1066	1071	1071	1073	1075	1078	1078	1078	1077	1078	1079	1075
12	1079	1078	1078	1078	1079	1081	1078	1075	1071	1066	1058	1055	1053	1062	1071	1083	1090	1095	1099	1095	1092	1089	1087	1087	1082	1078
13	1082	1073	1062	1038	1025	998	970	1004	1030	1048	1046	1050	1055	1071	1102	1111	1114	1117	1119	1103	1086	1031	1044	1028	1038	1058
14	1038	1014	990	1038	1058	1064	1074	1074	1076	1071	1071	1070	1071	1078	1087	1084	1081	1089	1103	1107	1091	1077	1067	1046	1026	1067
15	1026	1026	1020	1042	1060	1054	1057	1064	1070	1070	1070	1069	1068	1070	1079	1090	1090	1091	1089	1094	1091	1087	1082	1077	1071	1069
16	1071	1075	1075	1058	1053	1058	1063	1068	1069	1069	1066	1063	1060	1058	1063	1079	1085	1090	1088	1083	1084	1087	1086	1082	1078	1072
17	1078	1071	1063	1071	1077	1081	1082	1082	1080	1073	1064	1062	1062	1061	1066	1082	1104	1108	1117	1119	1127	1102	1075	1066	1052	1082
18	1052	1055	1056	1051	1045	1046	1047	1056	1064	1070	1068	1065	1074	1083	1091	1089	1087	1090	1095	1092	1090	1089	1086	1085	1086	1073
19	1086	1085	1086	1087	1089	1091	1091	1091	1087	1078	1070	1062	1062	1067	1074	1086	1101	1114	1115	1099	1089	1086	1089	1082	1078	1086
20	1078	1077	1070	1058	1044	1049	1063	1074	1076	1073	1071	1066	1064	1065	1068	1075	1087	1102	1103	1101	1104	1095	1087	1085	1084	1077
21	1084	1075	1054	1057	1058	1056	1060	1064	1064	1058	1048	1045	1051	1065	1071	1087	1115	1127	1156	1134	1114	1095	1100	1098	1095	1081
22	1095	1087	1082	1082	1078	1081	1083	1086	1087	1084	1075	1067	1066	1074	1081	1083	1087	1091	1092	1095	1098	1094	1075	1040	995	1080
23	995	1039	1075	1086	1090	1091	1092	1094	1094	1089	1081	1070	1064	1070	1083	1095	1114	1117	1111	1105	1102	1099	1097	1093	1087	1087
24	1087	1082	1077	1078	1076	1031	1038	1054	1071	1071	1074	1074	1089	1114	1151	1166	1186	1175	1158	1151	1134	1101	1059	1048	1025	1097
25	1025	1028	1055	1059	1064	1068	1066	1074	1080	1074	1071	1064	1066	1067	1074	1081	1094	1114	1110	1101	1100	1097	1095	1092	1091	1077
26	1091	1091	1085	1086	1087	1091	1091	1091	1087	1082	1075	1073	1077	1086	1101	1127	1184	1194	1204	1190	1159	1134	1107	1086	1086	1112
27	1086	1094	1096	1095	1083	1050	1041	1063	1075	1078	1083	1085	1086	1094	1096	1099	1102	1107	1110	1107	1105	1103	1100	1098	1097	1089
28	1097	1098	1097	1096	1095	1096	1095	1094	1091	1089	1083	1077	1075	1081	1093	1095	1102	1101	1098	1096	1095	1095	1093	1092	1089	1093
29	1090	1091	1093	1094	1092	1082	1083	1081	1082	1080	1079	1080	1081	1084	1086	1092	1104	1114	1116	1112	1107	1104	1100	1099	1099	1093
30	1099	1098	1099	1100	1101	1101	1099	1093	1088	1086	1080	1079	1076	1076	1083	1091	1098	1098	1096	1098	1097	1096	1095	1093	1092	1092
31	1093	1088	1092	1096	1095	1088	1085	1087	1087	1082	1078	1077	1074	1079	1085	1095	1100	1102	1101	1100	1099	1098	1097	1096	1095	1091
Mean	1071	1069	1066	1062	1061	1061	1062	1067	1071	1067	1067	1066	1067	1073	1082	1092	1101	1107	1109	1105	1100	1089	1082	1077	1072	1078

XX.—AUXILIARY OBSERVATIONS IN ABSOLUTE MEASURE; DAILY VALUES OF TEMPERATURE IN THE EAST ROOM OF MAGNETIC HOUSE; MAGNETIC NOTES FOR THE MONTH.

Eskdalemuir. **May, 1919.**

Date	Time G.M.T. From	Time G.M.T. To	Horizontal Force.	Declination.	Dip.	Temperature in Magnet House.	Magnetic Character of day (0–2).	Date.
May	h. m.	h. m.	γ	° ′ ″	° ′	a 280+		
						1·9	2	1
						1·9	2D	2
						2·0	2D	3
						2·0	1	4
						2·0	1	5
						2·1	1	6
7	11 5	11 32	16699	16 59 5	69 40·4	2·1	0C	7
						2·1	0C	8
9	8 15	8 50	16710	16 54 13	69 39·2	2·1	0	9
						2·1	0	10
						2·1	0C	11
						2·2	1	12
13	11 19	11 48	16688	17 5 28	69 41·4	2·2	2D	13
						2·2	1	14
						2·2	1	15
						2·3	1	16
						2·3	1	17
						2·4	1	18
						2·4	1	19
20	10 19	11 14	16675	17 3 3	69 41·8	2·5	1	20
						2·5	2D	21
						2·6	1	22
						2·6	1	23
						2·7	2D	24
						2·7	1	25
						2·7	1	26
27	10 20	11 6	16683	16 58 31	69 41·2	2·8	1	27
						2·8	0C	28
						2·8	0C	29
						3·0	0	30
						2·9	0	31

MAGNETIC NOTES.

May, 1919.

This month was characterised by its large average daily range, there being no less than 9 days on which the range of N. exceeded 160 γ. Comparatively quiet periods intervened from 6th to 12th and 28th to 31st. The principal disturbance of the month began with an unusually well marked sudden commencement at 1d. 22h. 56m., which shewed the characteristic fall in N. and W. before the larger rise. The actual amounts were: N., −10 γ, +83 γ; W., −4 γ, +32 γ; V., −11 γ. It was followed immediately by considerable disturbance. As is usual with storms whose sudden commencement is near midnight, there was no increase in V., but a sharp fall after midnight. This latter motion was accompanied by an inverted bay on N. and a double oscillation on W. The V. trace on 2nd to 3rd was of the usual form, the p.m. maximum occurring sharply at 2d. 17h. 3m., after which the minimum about 3d. 3h. 10m. (trace off sheet for a few minutes at that time) was reached in four sharp falls in value. A period of comparative quiescence on N. and W. is noted between 22h. and 24h. on 2nd, and this was accompanied (as has been observed at other times) by a gradual recovery in-V. towards its undisturbed value. Intense oscillatory activity observed from 5h. to 16h. on 3rd; also prominent tooth-like projection on N. and W. centering at 3d. 21h. 18m. Other moderate disturbances began at 13d. 4h. and 24d. 4h.

XXI.—TERRESTRIAL MAGNETIC FORCE: NORTH COMPONENT.

Eskdalemuir. (X.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **June, 1919.**

15,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1017	1016	1017	1018	1018	1016	1011	1001	992	982	992	993	992	993	992	996	1005	1018	1033	1033	1035	1042	1028	1025	1022	1011
2	1023	1016	1017	1014	1018	1018	1009	1000	992	985	979	978	982	983	992	1001	1017	1038	1055	1042	1041	1032	1032	1019	1015	1012
3	1015	1019	1021	1028	1027	1022	1013	1010	1003	998	987	978	975	979	997	1009	1014	1037	1033	1038	1037	1028	1026	1022	1019	1013
4	1020	1018	1018	1018	1020	1020	1016	1009	999	992	979	975	981	988	995	1006	1024	1015	1027	1029	1028	1027	1023	1024	1023	1011
5	1023	1023	1023	1027	1028	1026	1015	1009	1004	997	979	967	965	973	989	1009	1033	1033	1043	1044	1033	1029	1027	1020	1019	1013
6	1020	1021	1021	1020	1019	1021	1019	1014	1006	995	990	989	997	992	995	996	1007	1024	1033	1043	1036	1035	1029	1023	1014	1014
7	1014	1015	1015	1012	1012	1019	1014	1006	997	991	983	978	975	983	992	999	1015	1026	1031	1029	1028	1025	1024	1021	1018	1009
8	1019	1020	1016	1019	1019	1019	1013	1007	996	987	985	981	989	997	1001	1006	1008	1014	1021	1030	1031	1037	1033	1030	1031	1012
9	1031	1031	1032	1036	1034	1033	1024	1009	1007	998	996	993	987	992	997	1032	1015	999	1009	1020	1026	1025	1040	1022	1011	1016
10	1012	1002	1003	969	1003	1005	989	971	953	933	947	964	977	987	1011	1015	1029	1022	997	1017	1038	1030	1013	1012	1012	996
11	1012	1019	1001	964	990	1002	988	969	968	972	949	953	959	987	994	1006	1014	1021	1036	1049	1032	1041	1007	1002	987	997
12	987	1007	987	978	1001	997	964	962	958	948	942	949	957	966	987	982	992	1004	1022	1024	1037	1026	1026	999	1002	988
13	1003	994	999	998	1002	1003	1001	989	975	969	949	954	974	963	1004	993	1009	1013	1020	1030	1024	1017	1013	1013	1008	996
14	1008	1003	1004	1008	1008	1005	998	989	981	983	978	967	963	965	978	986	993	1007	1015	1018	1019	1018	1022	1018	1018	997
15	1018	1010	1006	1003	1002	1010	1018	1015	1003	994	968	964	970	983	990	998	1004	1012	1018	1023	1023	1021	1018	1013	1006	1003
16	1006	1011	1005	1007	1007	1000	1001	998	1003	992	978	973	968	967	974	986	1008	1009	1023	1027	1024	1026	1013	1006	1005	1000
17	1006	921	1005	1002	1013	1020	1024	1011	985	969	969	966	965	977	979	969	998	1008	1019	1020	1021	1019	1019	1014	1006	996
18	1006	1005	1008	995	1014	1008	1002	993	989	979	963	958	962	968	980	995	995	1010	1015	1023	1024	1022	1015	1015	1006	998
19	1006	1008	1009	1011	1013	1017	1021	1018	1016	1005	986	974	965	972	984	994	1005	1013	1024	1026	1026	1022	1016	1014	1012	1006
20	1013	1010	1010	1011	1013	1016	1016	1015	1008	994	984	977	976	986	992	995	1010	1014	1021	1025	1028	1021	1020	1018	1015	1007
21	1015	1012	1013	1017	1025	1026	1021	1014	1005	994	982	978	980	989	995	998	1008	1029	1039	1036	1032	1022	1011	1009	1000	1010
22	1001	1001	1002	1005	1010	1011	1006	1001	991	984	980	978	980	991	997	1008	1019	1046	1030	1044	1030	1026	1022	999	997	1007
23	997	1010	1006	1002	1002	1012	1008	993	982	968	964	957	954	966	985	1012	1031	1035	1048	1044	1031	1030	992	985	994	1001
24	994	996	980	990	984	997	1001	996	982	968	963	968	975	988	1009	1033	1035	1031	1042	1015	1007	1005	1006	1011	1014	999
25	1015	1016	1015	1017	1019	1017	1011	1000	987	977	965	963	965	975	979	992	1019	1026	1039	1057	1055	1051	1051	993	983	1008
26	983	977	1004	1016	1016	1016	1023	1014	1005	985	967	957	961	978	988	996	1003	1020	1015	1014	1013	1015	1012	1010	1008	1000
27	1008	1008	1011	1009	1009	1006	997	984	974	967	959	953	959	972	996	1010	1015	1018	1031	1041	1031	1027	1030	1030	1035	1002
28	1035	1037	1042	1036	1038	1039	1028	1012	999	992	987	989	990	997	1007	1021	1025	1032	1042	1041	1030	1032	1026	1028	1017	1021
29	1018	1019	1027	1018	1029	1023	1028	1028	1008	998	994	980	979	980	979	988	1001	1009	1017	1026	1025	1022	1019	1014	1011	1009
30	1011	1009	1013	1015	1017	1013	1008	999	994	983	971	969	965	970	984	995	1004	1009	1013	1023	1021	1023	1023	1022	1021	1002
Mean	1011	1008	1011	1009	1014	1015	1010	1001	992	983	974	971	973	980	991	1001	1012	1020	1027	1031	1029	1027	1021	1014	1011	1005

XXII.—TERRESTRIAL MAGNETIC FORCE: WEST COMPONENT.

Eskdalemuir. (—Y.) *Mean Values of Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **June, 1919.**

4,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	892	890	889	887	879	869	857	850	851	860	872	890	909	919	922	923	917	909	904	900	902	902	888	891	893	891
2	893	891	888	883	880	870	859	856	860	865	880	899	919	925	925	919	921	930	931	922	913	913	902	887	869	897
3	869	863	870	862	862	856	849	852	856	862	869	881	889	902	915	922	921	924	910	909	902	897	893	890	883	885
4	883	878	876	873	870	861	855	846	847	860	866	885	898	905	913	915	921	908	913	909	904	900	896	894	892	887
5	892	890	890	883	878	871	867	867	866	871	882	892	901	909	910	913	917	914	910	910	909	895	897	893	888	893
6	888	883	881	871	866	856	850	851	855	859	877	893	914	918	922	917	909	905	902	905	902	904	899	888	894	888
7	894	892	888	884	882	870	853	846	848	857	876	893	909	921	924	917	913	905	898	896	898	898	898	897	898	890
8	898	892	888	881	865	858	856	856	859	872	886	898	909	916	915	909	904	904	909	912	906	905	901	893	885	891
9	885	882	883	879	880	872	851	845	840	855	878	887	905	927	940	951	936	914	907	902	900	889	862	865	840	888
10	841	832	842	852	867	846	825	841	845	860	884	901	924	942	943	948	935	933	918	908	889	868	880	863	869	883
11	869	873	851	857	875	856	845	836	847	857	872	891	900	917	913	914	920	911	897	905	899	897	879	868	868	881
12	868	895	871	877	863	859	851	862	847	841	863	885	907	926	930	923	916	905	903	894	894	890	896	897	868	886
13	868	888	877	873	876	855	838	831	840	845	866	889	916	924	920	910	919	908	899	893	894	894	896	894	888	884
14	888	884	882	881	874	867	855	854	854	858	866	881	902	922	931	927	920	914	902	894	891	893	889	882	881	888
15	881	873	873	883	878	866	851	846	851	851	862	878	900	921	926	925	920	915	909	900	893	890	888	875	874	885
16	874	873	872	870	864	866	860	852	854	856	864	870	889	901	906	914	918	914	910	903	897	889	875	882	878	882
17	878	876	859	874	871	856	857	845	836	844	864	883	900	914	920	914	920	914	905	900	897	894	894	885	889	884
18	889	889	893	885	900	873	862	862	858	861	862	872	889	905	911	918	909	900	894	893	894	896	891	883	877	887
19	877	882	891	893	888	878	869	867	867	863	861	871	888	901	909	909	907	899	894	890	889	888	886	884	884	886
20	885	884	885	884	880	875	869	865	860	859	867	874	890	906	912	916	917	910	907	901	899	895	894	900	896	889
21	896	893	890	884	875	870	868	859	858	859	869	885	903	916	921	921	925	917	907	900	901	900	895	885	880	891
22	880	880	876	869	864	859	858	859	852	849	858	874	890	906	914	916	918	921	901	905	909	909	912	872	863	885
23	863	864	845	843	856	847	841	840	839	841	857	877	908	916	921	927	932	929	926	915	885	884	883	883	877	880
24	877	856	843	856	863	868	863	856	851	853	873	891	915	933	944	938	932	923	915	899	908	903	898	895	898	890
25	898	898	877	869	858	853	848	847	846	843	857	873	892	903	912	915	916	915	917	907	901	907	890	853	867	882
26	867	829	859	877	878	871	863	848	850	857	861	868	884	897	906	911	904	900	894	891	895	895	892	890	885	879
27	885	883	879	875	871	860	848	842	847	852	869	885	900	909	929	930	921	913	910	910	904	901	900	893	894	888
28	894	884	868	865	861	854	852	859	865	862	872	879	894	905	915	920	916	908	903	900	895	894	885	884	858	884
29	859	856	859	860	856	868	868	856	855	862	875	892	919	938	942	941	937	922	908	901	894	891	892	890	886	890
30	886	884	883	883	876	869	859	853	849	853	869	886	906	924	930	928	922	912	906	901	898	895	891	888	886	890
Mean	881	878	874	874	872	863	855	852	852	856	869	884	902	916	921	922	919	913	907	903	899	896	891	885	880	887

XXIII.—TERRESTRIAL MAGNETIC FORCE: VERTICAL COMPONENT.

Eskdalemuir. (Z.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **June, 1919.**

44,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Mean	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1095	1094	1094	1095	1096	1098	1098	1096	1089	1082	1075	1067	1065	1068	1075	1083	1087	1088	1092	1093	1095	1093	1091	1090	1088	1087
2	1088	1089	1089	1091	1093	1094	1092	1088	1088	1084	1078	1076	1071	1073	1079	1085	1087	1088	1095	1104	1104	1102	1097	1095	1091	1089
3	1091	1088	1083	1082	1086	1090	1089	1085	1084	1081	1078	1073	1068	1067	1072	1079	1088	1089	1091	1092	1093	1093	1091	1088	1089	1084
4	1089	1088	1089	1091	1092	1093	1093	1092	1088	1079	1073	1068	1067	1068	1072	1075	1080	1088	1089	1089	1089	1089	1088	1088	1088	1084
5	1089	1089	1090	1092	1094	1097	1098	1094	1092	1088	1081	1076	1076	1080	1085	1089	1090	1093	1093	1096	1097	1098	1094	1093	1092	1090
6	1093	1092	1091	1094	1097	1098	1097	1090	1084	1079	1074	1070	1065	1069	1078	1087	1095	1103	1106	1103	1102	1098	1098	1098	1096	1090
7	1096	1095	1096	1097	1097	1096	1095	1092	1093	1089	1079	1072	1072	1072	1081	1090	1097	1102	1104	1100	1097	1098	1096	1095	1095	1092
8	1095	1094	1093	1092	1095	1096	1095	1091	1090	1087	1078	1072	1070	1077	1083	1090	1092	1092	1091	1090	1093	1093	1093	1094	1094	1089
9	1095	1092	1092	1092	1092	1091	1091	1094	1091	1090	1087	1084	1077	1082	1095	1106	1128	1134	1123	1114	1107	1107	1103	1088	1068	1098
10	1069	1062	1058	1040	1040	1065	1081	1085	1084	1083	1083	1075	1075	1088	1105	1117	1129	1124	1109	1106	1104	1108	1099	1089	1079	1087
11	1079	1064	1062	1053	1060	1082	1088	1097	1100	1099	1089	1080	1079	1083	1094	1107	1108	1115	1122	1119	1113	1100	1089	1087	1064	1090
12	1064	1063	1052	1035	1073	1090	1095	1092	1094	1093	1091	1088	1089	1094	1104	1109	1110	1112	1112	1109	1111	1112	1104	1077	1085	1091
13	1085	1073	1081	1090	1093	1094	1099	1095	1092	1089	1084	1080	1076	1082	1093	1100	1105	1110	1111	1116	1114	1110	1104	1093	1093	1095
14	1094	1101	1104	1104	1106	1108	1106	1105	1101	1096	1094	1090	1081	1085	1091	1093	1100	1105	1106	1108	1108	1106	1105	1103	1101	1100
15	1101	1102	1102	1101	1097	1096	1093	1093	1092	1086	1084	1079	1076	1082	1089	1094	1102	1105	1106	1108	1108	1107	1105	1105	1105	1097
16	1106	1101	1103	1104	1107	1107	1102	1099	1095	1095	1086	1079	1080	1080	1085	1091	1101	1105	1107	1110	1109	1108	1109	1106	1104	1099
17	1105	1099	1095	1099	1100	1102	1099	1096	1091	1086	1078	1074	1075	1086	1094	1105	1110	1114	1117	1117	1115	1111	1106	1105	1106	1099
18	1106	1106	1103	1100	1084	1084	1092	1097	1100	1096	1092	1088	1085	1087	1096	1100	1107	1110	1113	1116	1114	1113	1111	1110	1107	1100
19	1108	1105	1103	1101	1103	1104	1107	1108	1107	1105	1101	1095	1092	1099	1102	1108	1112	1115	1117	1117	1117	1115	1111	1109	1108	1107
20	1108	1108	1109	1110	1111	1111	1110	1109	1108	1103	1102	1100	1092	1093	1097	1101	1102	1106	1111	1113	1113	1112	1111	1108	1107	1106
21	1107	1107	1106	1107	1109	1110	1111	1110	1106	1102	1099	1095	1094	1094	1097	1099	1102	1107	1115	1124	1124	1120	1116	1112	1110	1107
22	1110	1106	1108	1109	1112	1113	1109	1110	1108	1103	1101	1095	1080	1080	1090	1099	1105	1111	1123	1127	1124	1119	1113	1096	1105	1106
23	1105	1097	1093	1088	1089	1095	1101	1104	1105	1105	1104	1096	1091	1093	1101	1109	1129	1142	1152	1154	1152	1139	1120	1113	1109	1112
24	1109	1100	1092	1087	1085	1078	1083	1088	1091	1093	1096	1096	1094	1101	1113	1133	1147	1148	1149	1147	1128	1117	1114	1112	1112	1108
25	1112	1105	1104	1108	1112	1115	1115	1113	1108	1101	1101	1099	1096	1096	1097	1098	1104	1109	1109	1124	1132	1125	1121	1100	1094	1108
26	1095	1090	1109	1112	1114	1116	1110	1116	1116	1117	1114	1110	1113	1116	1121	1126	1133	1135	1132	1126	1122	1119	1119	1118	1118	1117
27	1118	1118	1117	1118	1118	1119	1119	1118	1113	1108	1105	1108	1109	1113	1113	1115	1120	1120	1120	1121	1122	1121	1119	1119	1116	1116
28	1116	1112	1110	1116	1118	1118	1113	1113	1114	1109	1103	1099	1100	1102	1109	1113	1114	1116	1118	1119	1119	1120	1120	1117	1118	1113
29	1118	1116	1113	1111	1109	1104	1090	1091	1092	1094	1095	1089	1088	1093	1104	1112	1118	1127	1129	1125	1121	1119	1117	1117	1117	1108
30	1117	1117	1118	1117	1119	1119	1119	1117	1117	1116	1111	1102	1096	1097	1099	1108	1114	1124	1122	1120	1118	1118	1117	1116	1116	1114
Mean	1099	1096	1095	1095	1097	1099	1100	1099	1098	1095	1091	1086	1083	1087	1094	1101	1107	1111	1113	1114	1112	1110	1106	1101	1099	1099

XXIV.—AUXILIARY OBSERVATIONS IN ABSOLUTE MEASURE; DAILY VALUES OF TEMPERATURE IN THE EAST ROOM OF MAGNETIC HOUSE; MAGNETIC NOTES FOR THE MONTH.

Eskdalemuir. **June, 1919.**

Date	Time G.M.T. From	Time G.M.T. To	Horizontal Force.	Declination.	Dip.	Temperature in Magnet House.	Magnetic Character of day (0–2).	Date.
June	h. m.	h. m.	γ	° ′ ″	° ′	a 280+		
						3·0	1	1
						3·0	1	2
3	10 42	11 5	16709	16 59 3	69 39·7	3·0	0	3
						3·1	1	4
						3·2	1	5
						3·4	0	6
						3·4	0C	7
						3·4	0C	8
						3·5	2D	9
						3·5	2D	10
11	15 13	15 57	16758	17 4 23	69 38·0	3·6	1D	11
12	16 9	16 38	16727	17 3 49	69 39·2	3·6	1	12
						3·6	1	13
						3·7	0	14
						3·7	0	15
						3·8	0	16
						3·9	1	17
18	14 25	14 35	16736	17 5 25		3·9	0	18
19	10 32	10 46			69 39·9	3·9	0C	19
						4·0	0C	20
						4·0	0	21
						4·1	1	22
						4·1	1D	23
24	10 43	11 13	16705	17 3 7	69 40·5	4·1	1	24
						4·2	1	25
						4·3	1D	26
						4·4	1	27
						4·4	0	28
						4·4	1	29
						4·4	0C	30

MAGNETIC NOTES.

June, 1919.

The month was free from large disturbances, the 9th to 12th being the only days on which the departures from normal were noteworthy. This interval began with a series of oscillatory motions, different from the "sudden commencement" type, shortly before 9d. 6h. The only other feature of interest in the month was the curious inverted bay on the V. trace, beginning about 22h. on 22nd. It was accompanied by a tooth-like projection upwards on the N. trace, and a wave-like motion on W. (*See* also *Magnetic Notes*, December, 1919.)

XXV.—TERRESTRIAL MAGNETIC FORCE: NORTH COMPONENT.

Eskdalemuir. (X.) *Mean Values for Periods of* 60 *Minutes centred at the Hours of Greenwich Mean Time.* **July, 1919.**

15,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1021	1020	1019	1022	1027	1027	1024	1016	1005	997	985	977	974	983	995	1014	1030	1038	1043	1048	1043	1051	1060	1043	1053	1020
2	1053	1043	1036	1036	1032	1038	1033	1018	1010	999	990	983	976	979	986	1004	1017	1024	1037	1044	1038	1032	1026	1021	1023	1018
3	1024	1024	1019	1030	1034	1028	1033	1025	1017	997	961	948	944	984	999	1009	1019	1034	1030	986	987	981	1024	1024	1015	1007
4	1015	1015	1014	1020	1021	1009	1009	1015	1009	1000	984	978	972	979	996	999	1013	1013	1029	1026	1026	1023	1019	1021	1022	1009
5	1022	1014	1014	1009	1011	1008	1004	1006	1000	990	977	973	969	979	989	996	1007	1013	1018	1019	1019	1019	1017	1017	1015	1004
6	1016	1017	1019	1017	1018	1019	1017	1012	1007	997	983	971	972	981	994	1001	1015	1024	1030	1031	1029	1026	1025	1026	1025	1010
7	1025	1022	1021	1023	1027	1029	1027	1013	1003	1005	992	987	986	984	996	1006	1031	1040	1048	1039	1040	1035	1025	1020	1020	1018
8	1020	1015	1029	1030	1021	1025	1014	1001	994	977	971	961	967	958	972	981	1017	1030	1036	1042	1031	1032	1041	1020	996	1007
9	997	1021	1009	1012	1013	1010	1012	998	978	966	958	959	958	973	984	988	1009	1023	1020	1028	1032	1026	1049	1027	1011	1002
10	1011	1009	1012	1018	1012	1014	1013	1006	998	990	972	956	961	966	984	1005	1006	1032	1024	1024	1035	1025	1024	1021	1017	1005
11	1017	1015	1015	*	*	*	*	*	*	*	964	963	961	973	993	1023	1020	1016	1024	1033	1041	1036	1025	1016	1017	—
12	1018	1021	1007	*	*	*	*	*	*	*	973	963	963	967	983	1010	1022	1032	1032	1053	1043	1031	1023	1019	1013	—
13	1013	1013	1015	1015	1017	1016	1012	1003	993	984	975	966	969	982	980	1007	1026	1013	1030	1048	1043	1034	1034	1012	1010	1008
14	1010	1011	1016	1019	1015	1008	1003	1008	1006	992	973	985	961	960	971	992	1007	1019	1024	1022	1021	1019	1022	1016	1013	1003
15	1014	1013	1015	1011	1013	1019	1019	1016	1012	999	986	979	980	990	1004	1010	1014	1017	1021	1027	1028	1025	1025	1024	1024	1011
16	1024	1023	1023	1023	1024	1026	1024	1019	1013	1000	979	979	978	982	987	998	1016	1025	1025	1027	1031	1028	1026	1024	1021	1013
17	1022	1021	1026	1030	1033	1044	1047	1035	1044	1010	990	985	990	989	1000	1084	1089	1102	1093	1073	1020	1000	994	989	998	1029
18	998	992	959	999	1013	1014	987	993	993	973	940	945	950	965	981	987	998	1005	1009	1016	1016	1020	1014	1004	1003	991
19	1003	1003	1002	1004	1002	1006	1004	1000	995	987	976	970	968	977	994	1006	1015	1021	1023	1020	1021	1018	1012	1001	1003	1001
20	1004	1011	1012	1008	1011	1014	1010	1002	991	985	979	977	974	982	992	1012	1006	1016	1032	1027	1023	1021	1023	1015	1013	1005
21	1013	1022	1016	1014	1016	1022	1021	1016	1011	1004	988	980	979	990	1002	1010	1015	1015	1018	1021	1023	1025	1026	1023	1015	1011
22	1015	1007	1009	1010	1011	1012	1008	1005	1002	994	994	988	979	1000	992	987	1023	1014	1073	1036	1019	1033	1027	1047	1029	1012
23	1030	1057	1042	1016	949	990	1012	993	978	965	953	953	942	948	972	977	1002	1018	1006	1016	1016	1014	1016	1023	1010	995
24	1010	1010	997	975	994	1012	999	992	984	959	953	962	947	964	994	1006	1011	1018	1027	1015	1017	1018	1018	1021	1016	996
25	1017	1010	997	1000	1007	1014	1016	1006	997	990	986	980	984	992	1004	1022	1017	1021	1022	1023	1018	1021	1019	1017	1014	1007
26	1014	1014	1017	1008	‡	‡	‡	‡	‡	‡	988	982	977	980	993	1002	1008	1027	1029	1034	1026	1025	1023	1022	1018	—
27	1018	1018	1019	1021	1020	1019	1006	1007	1007	990	976	974	973	978	988	993	1000	1008	1022	1029	1027	1028	1023	1018	1017	1007
28	1018	1015	1016	1014	1022	1027	1025	1022	1010	993	981	975	980	988	992	998	1009	1015	1022	1023	1026	1025	1026	1025	1027	1010
29	1027	1027	1026	1032	1028	1030	1022	1014	1004	992	970	962	975	989	1002	1012	1011	1026	1023	1027	1032	1025	1026	1023	1028	1013
30	1029	1027	1019	1024	1025	1024	1024	1019	1009	997	990	988	983	989	994	988	1004	1023	1031	1032	1028	1030	1029	1029	1030	1014
31	1030	1030	1026	1025	1028	1024	1015	1007	997	982	960	950	969	989	997	1002	1014	1019	1028	1029	1030	1030	1027	1029	1027	1010
Mean †	1018	1018	1015	1016	1016	1019	1016	1010	1002	990	976	971	970	979	991	1003	1016	1024	1030	1029	1026	1024	1025	1021	1018	1008

* Burner choked. † Mean for 28 days only, 11th, 12th and 26th omitted. ‡ Gas failed.

XXVI.—TERRESTRIAL MAGNETIC FORCE: WEST COMPONENT.

Eskdalemuir. (—Y.) *Mean Values for Periods of* 60 *Minutes centred at the Hours of Greenwich Mean Time.* **July, 1919.**

4,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	886	885	880	880	875	866	863	856	852	850	855	872	895	916	927	930	928	928	923	922	911	909	908	900	890	892
2	890	876	872	869	867	863	854	847	842	843	858	881	904	921	926	929	922	907	901	905	902	902	899	896	891	887
3	891	886	879	890	891	886	874	860	856	849	854	873	897	912	920	918	912	908	900	895	896	896	893	891	887	889
4	887	890	890	873	872	872	868	857	851	854	859	867	885	904	914	918	916	909	910	901	901	899	894	902	892	887
5	892	874	874	886	880	874	872	859	852	850	858	872	887	896	906	910	910	905	901	895	891	892	893	892	891	884
6	891	890	885	877	875	875	868	858	847	841	848	859	882	906	919	918	917	912	904	897	895	895	894	891	890	885
7	890	890	886	888	885	872	859	848	840	847	865	883	901	911	923	923	933	930	924	913	912	895	874	884	889	891
8	890	878	888	847	843	844	838	834	835	846	869	883	902	917	934	933	930	912	920	914	906	905	884	866	882	884
9	882	873	863	866	865	865	865	853	840	852	875	894	908	915	921	915	918	911	909	906	900	901	892	877	862	886
10	862	876	877	881	876	868	857	860	860	862	861	870	885	904	920	924	916	913	900	896	896	891	891	888	883	885
11	883	879	883	882	878	866	860	851	848	839	852	867	882	898	913	928	913	906	900	900	903	892	892	893	892	884
12	892	878	881	882	880	877	860	855	855	860	892	882	900	918	923	928	923	917	902	894	897	895	892	883	885	890
13	885	880	886	872	861	855	855	855	855	856	865	879	902	918	918	923	921	909	906	903	898	897	883	876	884	886
14	884	881	877	871	870	864	855	866	863	865	876	880	882	891	896	907	909	906	900	893	892	891	892	887	885	883
15	885	886	890	892	882	874	866	861	855	855	864	876	892	906	918	919	913	902	892	887	892	892	889	888	891	887
16	891	889	884	882	876	868	865	859	855	856	875	893	910	923	927	921	919	915	908	903	903	901	896	891	887	892
17	887	886	878	880	880	886	891	906	873	860	865	879	902	918	933	969	980	1001	961	932	921	882	866	869	871	904
18	872	888	901	879	872	850	851	843	844	848	856	877	894	914	925	922	913	901	891	887	889	897	892	886	875	883
19	875	867	859	872	865	860	858	856	856	856	858	864	884	902	914	919	915	908	902	897	894	873	868	841	844	877
20	844	840	854	860	865	859	850	850	851	858	869	877	890	907	920	929	924	920	910	903	898	891	877	879	875	881
21	875	866	866	868	861	854	855	858	866	865	862	870	886	899	908	910	908	903	899	895	893	893	892	874	861	880
22	861	867	874	876	872	867	852	847	844	852	867	887	900	919	923	920	931	925	958	930	901	902	893	902	897	891
23	897	871	856	862	919	895	885	868	850	866	877	887	912	921	930	927	916	901	896	894	894	891	893	862	869	890
24	869	867	880	873	871	852	843	846	853	856	864	876	890	904	914	919	910	902	897	892	890	891	887	881	886	881
25	887	875	890	893	876	867	867	863	862	859	862	871	892	910	924	925	915	904	896	895	892	892	894	894	894	888
26	894	896	900	876	*	*	*	*	*	*	*	895	918	926	927	922	905	898	890	894	894	894	893	894	890	—
27	890	888	885	880	876	868	867	872	873	873	891	904	911	924	927	923	911	900	895	894	894	894	891	891	886	893
28	886	883	879	878	877	867	861	857	855	857	869	884	904	919	928	926	916	905	895	889	893	891	893	893	889	888
29	889	892	904	872	867	869	857	853	853	854	862	884	909	922	920	921	916	916	908	904	904	901	898	894	886	890
30	886	862	867	871	872	864	864	861	861	862	869	884	898	906	915	914	912	914	903	899	898	899	894	893	888	886
31	888	882	882	884	879	871	863	868	855	853	863	884	899	911	924	924	915	899	894	890	891	881	889	894	885	887
Mean †	883	878	879	876	874	867	862	858	854	855	865	879	897	911	921	923	919	913	907	901	898	894	890	885	883	887

* Gas failed. † Mean for 28 days only, 11th, 12th and 26th omitted.

XXVII.—TERRESTRIAL MAGNETIC FORCE: VERTICAL COMPONENT.

Eskdalemuir. (Z.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **July, 1919.**

44,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1117	1117	1118	1119	1119	1119	1117	1114	1110	1106	1104	1101	1094	1094	1094	1097	1105	1112	1119	1119	1119	1118	1114	1113	1109	1111
2	1109	1112	1114	1115	1118	1117	1119	1115	1112	1105	1098	1094	1090	1092	1095	1100	1108	1115	1118	1120	1119	1117	1115	1115	1115	1110
3	1115	1115	1117	1115	1116	1114	1109	1111	1110	1107	1102	1097	1106	1111	1109	1113	1122	1129	1131	1128	1125	1122	1121	1117	1117	1115
4	1117	1115	1109	1106	1109	1109	1108	1112	1113	1107	1102	1098	1096	1101	1109	1113	1120	1123	1123	1126	1124	1122	1119	1113	1098	1112
5	1098	1098	1105	1108	1109	1114	1113	1113	1114	1113	1111	1107	1098	1098	1106	1113	1117	1121	1123	1123	1121	1119	1118	1117	1117	1112
6	1117	1117	1115	1117	1119	1117	1118	1118	1112	1110	1109	1108	1102	1098	1102	1110	1111	1115	1117	1117	1117	1117	1115	1115	1115	1113
7	1116	1116	1116	1116	1115	1116	1120	1122	1115	1106	1106	1104	1097	1098	1100	1107	1111	1119	1128	1135	1135	1134	1126	1119	1117	1116
8	1117	1116	1099	1067	1074	1086	1097	1101	1103	1101	1104	1103	1101	1102	1107	1116	1127	1147	1143	1134	1127	1126	1116	1109	1106	1109
9	1106	1085	1092	1106	1112	1116	1116	1118	1117	1114	1102	1095	1091	1099	1107	1114	1115	1122	1123	1121	1123	1121	1114	1107	1110	1110
10	1111	1114	1117	1117	1115	1113	1113	1113	1112	1110	1109	1111	1111	1110	1110	1114	1121	1129	1136	1136	1129	1120	1114	1116	1118	1117
11	1118	1119	1120	1117	1119	1121	1120	1118	1116	1114	1113	1106	1101	1100	1101	1108	1121	1125	1124	1121	1120	1123	1120	1115	1111	1116
12	1111	1107	1104	1098	1104	1105	1109	1111	1113	1113	1105	1099	1096	1100	1104	1110	1114	1120	1128	1134	1131	1130	1127	1122	1121	1113
13	1121	1120	1115	1109	1115	1119	1115	1112	1108	1108	1111	1105	1101	1096	1102	1112	1121	1129	1131	1133	1133	1129	1120	1119	1119	1116
14	1119	1119	1117	1116	1116	1115	1112	1108	1110	1108	1105	1100	1105	1111	1106	1107	1113	1120	1127	1127	1124	1123	1121	1121	1119	1115
15	1119	1119	1118	1117	1118	1119	1121	1122	1121	1121	1117	1111	1104	1104	1102	1108	1113	1119	1121	1121	1121	1119	1118	1117	1117	1116
16	1117	1117	1118	1119	1121	1121	1121	1118	1116	1112	1107	1099	1098	1102	1108	1106	1107	1113	1119	1121	1121	1120	1119	1118	1117	1114
17	1118	1117	1114	1112	1114	1115	1114	1109	1112	1117	1113	1102	1095	1097	1102	1114	1160	1219	1231	1216	1191	1159	1138	1129	1126	1134
18	1126	1119	1077	1072	1082	1091	1108	1116	1117	1117	1117	1117	1117	1121	1131	1136	1138	1136	1135	1137	1136	1130	1129	1129	1130	1118
19	1130	1130	1123	1112	1121	1126	1129	1130	1130	1131	1126	1123	1121	1118	1120	1124	1129	1131	1131	1132	1134	1136	1133	1131	1119	1127
20	1119	1114	1111	1115	1119	1125	1127	1124	1119	1115	1109	1106	1101	1102	1109	1117	1119	1117	1119	1124	1128	1128	1125	1122	1122	1117
21	1122	1120	1117	1118	1120	1120	1121	1120	1119	1112	1109	1110	1109	1109	1111	1113	1115	1117	1120	1121	1122	1122	1122	1123	1121	1117
22	1121	1120	1120	1120	1122	1123	1124	1120	1113	1107	1097	1090	1089	1094	1104	1106	1108	1118	1126	1154	1165	1146	1132	1122	1089	1118
23	1090	1063	1065	1066	1048	1011	1038	1069	1094	1108	1115	1119	1121	1131	1142	1146	1150	1158	1153	1142	1136	1135	1133	1125	1118	1107
24	1118	1078	1113	1108	1108	1118	1121	1125	1125	1123	1122	1119	1116	1121	1122	1125	1130	1130	1137	1137	1136	1133	1131	1129	1125	1122
25	1125	1117	1114	1109	1115	1121	1122	1125	1129	1127	1129	1127	1123	1121	1125	1129	1136	1137	1134	1135	1134	1131	1130	1129	1126	1126
26	1126	1125	1117	*	*	*	*	*	*	*	1117	1114	1112	1112	1113	1117	1123	1129	1129	1126	1122	1121	1121	1121	1121	—
27	1121	1121	1121	1122	1121	1121	1121	1117	1113	1110	1109	1104	1100	1102	1108	1117	1126	1133	1134	1129	1125	1125	1125	1125	1125	1119
28	1125	1125	1125	1125	1125	1125	1123	1121	1121	1122	1113	1109	1109	1108	1114	1121	1126	1129	1129	1125	1122	1123	1122	1122	1122	1121
29	1122	1122	1117	1113	1118	1121	1121	1119	1119	1119	1117	1113	1110	1112	1117	1121	1126	1131	1133	1133	1131	1129	1127	1126	1122	1122
30	1122	1121	1122	1123	1125	1126	1125	1125	1121	1120	1112	1107	1102	1101	1109	1118	1121	1127	1129	1127	1125	1121	1121	1121	1121	1120
31	1121	1121	1121	1122	1122	1123	1121	1117	1117	1116	1108	1108	1107	1106	1106	1113	1120	1126	1128	1128	1125	1125	1122	1121	1121	1119
Mean†	1117	1113	1112	1110	1112	1113	1115	1115	1115	1113	1110	1107	1104	1106	1110	1115	1122	1129	1132	1132	1130	1127	1123	1120	1117	1117

* Gas failed.

† Mean for 28 days only, 11th, 12th and 26th omitted.

XXVIII.—AUXILIARY OBSERVATIONS IN ABSOLUTE MEASURE; DAILY VALUES OF TEMPERATURE IN THE EAST ROOM OF MAGNET HOUSE; MAGNETIC NOTES FOR THE MONTH.

Eskdalemuir. **July, 1919.**

Date	Time G.M.T. From	Time G.M.T. To	Horizontal Force.	Declination.	Dip.	Temperature in Magnet House.	Magnetic Character of day (0–2).	Date.
July	h. m.	h. m.	γ	° ′ ″	° ′	a 280+		
1	10 23	10 36			69 40·2	4·4	I	1
1	14 24	14 31	16731	17 7 17		4·4	I	2
						4·5	I	3
						4·5	0	4
						4·5	0C	5
						4·5	0C	6
						4·6	I	7
8	10 7	10 39	16680	16 59 42	69 40·6	4·5	ID	8
						4·6	I	9
						4·7	I	10
						4·7	I	11
						4·7	0	12
						4·7	I	13
						4·7	0	14
						4·7	0C	15
16	10 20	10 52	16718	17 0 18	69 40·1	4·8	0C	16
						4·8	2D	17
						4·8	ID	18
						4·8	0	19
						4·9	0	20
						4·7	0	21
						4·9	ID	22
23	15 51	16 19	16736	17 4 36	69 40·2	5·0	2D	23
						5·1	I	24
						5·1	0	25
						4·8	0	26
						4·9	0	27
						5·1	0C	28
29	10 56	11 2	16710	16 59 55		5·3	I	29
29	14 56	15 14			69 38·4	5·4	0	30
						5·5	0	31

MAGNETIC NOTES.

July, 1919.

The month was one of quite moderate activity, the most disturbed days being 17th and 23rd; the quietest, 5th, 15th, 21st, 27th, 30th. Two sharp movements are recorded on the horizontal traces on 1st, which resemble the sudden commencement type. The first was at 13h. 13m., the second, which was slower but larger, at 21h. 30m. Except that the N. trace was slightly agitated between these two times, and that V. showed some small irregular motions after the second, no disturbance was associated with them. A case of repetition occurs at 9d. 0h., 9d. 21h., and 10d. 19h., the movement being a bay-like projection on the N. trace. An inverted bay on the N. and W. traces at 13d. 14h. is noteworthy. The largest daily ranges were those of the disturbance which began with a feeble sudden commencement at 17d. 5h. 18m., and which included a notable rise in N. from 14h. to 20h. on 17th. In connection with the disturbance of the 22nd to the 23rd, the occurrence of hollows on the N. trace and peaks on the W. trace, coincident with rapid falls in the value of V. at 24h. and 4h., is noteworthy.

HOURLY VALUES FROM AUTOGRAPHIC RECORDS.

XXIX.—TERRESTRIAL MAGNETIC FORCE: NORTH COMPONENT.

Eskdalemuir. (X.) *Mean Values for Periods of* 60 *Minutes centred at the Hours of Greenwich Mean Time.* **August, 1919.**

15,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1027	1022	1018	1016	1023	1028	1027	1022	1013	996	976	976	953	975	989	1001	1038	1056	1019	1027	1019	1022	1016	1028	1019	1012
2	1020	1032	1009	1016	1014	1004	1015	1019	1015	1005	991	984	973	1027	994	998	1004	1020	1033	1036	1028	1020	1020	1010	1018	1012
3	1018	1004	1005	1001	1024	1018	1000	1005	1003	988	971	967	975	989	984	995	1011	1019	1015	1019	1024	1010	1015	1011	1009	1003
4	1010	1011	1011	1014	1015	1013	1010	1005	999	989	977	968	976	991	990	1001	1021	1020	1036	1026	1015	1013	1019	1011	1005	1006
5	1005	1005	1006	1007	1010	1010	1005	1000	995	988	979	970	978	972	1013	989	1000	1005	1006	1006	1018	1027	1020	1010	1015	1001
6	1015	1008	1005	1005	1007	1006	1000	989	995	988	982	978	983	987	994	996	1018	1015	1015	1015	1021	1017	1015	1015	1013	1003
7	1014	1016	1014	1014	1016	1014	1010	1007	998	984	977	970	972	983	1000	1012	1011	1013	1016	1027	1031	1015	1021	1020	1022	1007
8	1022	1013	1008	1010	1012	1007	1006	1004	997	983	969	970	971	978	1003	1006	1001	1003	1019	1022	1014	1016	1029	1020	1011	1003
9	1012	1004	1017	1011	1012	1013	1012	1009	1001	991	977	972	970	988	998	1004	1006	1019	1018	1022	1026	1018	1015	1013	1012	1005
10	1012	1011	1011	1012	1014	1017	1016	1010	1005	998	987	984	990	993	992	1001	1008	1013	1022	1036	1027	1023	1026	1027	1028	1010
11	1028	1033	1023	1022	1025	1028	995	*	*	*	841	926	932	947	1051	*	*	*	1054	1046	1027	994	999	996	912	—
12	913	944	743	944	955	1009	1029	1018	995	949	920	921	934	952	966	987	998	983	1008	957	967	963	962	960	960	958
13	960	964	964	965	969	968	965	959	951	940	931	925	927	936	950	963	973	976	980	985	985	983	979	978	975	962
14	976	975	975	975	975	976	975	970	959	950	945	946	953	965	972	980	981	987	996	1001	1000	996	993	995	999	976
15	999	996	995	995	995	995	995	991	982	975	965	960	956	957	970	979	989	1000	1003	1029	1011	1009	1009	996	1009	990
16	1010	1008	989	997	997	999	999	994	983	976	957	951	955	966	982	995	1005	1010	1021	1016	1004	1010	1001	1001	998	993
17	998	1018	998	1006	1010	1020	1014	1002	987	976	969	967	966	966	967	977	983	995	1006	1017	1014	1010	995	987	995	994
18	996	995	998	1001	1003	1007	1012	1002	992	993	970	958	949	967	969	973	993	1006	1021	1032	1027	1034	1035	1035	1009	999
19	1009	1008	1010	1002	995	1029	994	993	963	954	919	964	967	905	953	982	993	984	984	1009	1041	1017	999	1000	1007	986
20	1007	1005	983	1001	959	982	1002	993	964	952	942	943	940	957	977	1003	997	1010	1011	1011	1011	1006	996	991	996	985
21	997	996	985	993	998	1001	1001	994	979	968	959	961	967	978	984	992	1000	1002	998	999	1002	1004	1008	1012	1012	991
22	1012	1011	1012	1008	1006	998	1002	996	987	973	963	964	972	979	988	978	994	1002	1011	1012	1013	1017	1008	1007	1007	996
23	1007	1011	1007	999	1004	1005	1004	1000	989	978	964	973	973	969	1007	1013	997	984	1008	1007	1015	1013	1037	1017	1013	999
24	1013	992	995	993	999	1004	1007	992	990	988	976	971	973	982	989	1004	1012	1016	1016	1018	1017	1015	1015	1011	1002	999
25	1002	1012	1011	1010	1010	1011	1007	1000	989	978	973	978	981	987	997	1003	1009	1012	1018	1031	1017	1007	1007	1007	988	1002
26	989	1008	1009	1013	1018	1028	1019	1004	1008	984	960	955	970	969	963	1000	1013	1024	1003	984	1005	1008	1009	1011	1013	999
27	1013	1011	1010	1013	1018	1013	1012	988	994	984	979	966	978	984	994	999	995	1004	1009	1013	1009	1014	1011	1012	1010	1001
28	1010	1008	1007	1002	1003	1005	1004	1001	984	968	959	965	984	1004	996	989	994	1018	1017	1018	1025	1034	1032	1013	1004	1002
29	1004	1005	1004	1005	1008	1008	994	1002	984	963	934	941	965	970	980	989	1000	1006	1008	1010	1013	1013	1010	1013	1014	993
30	1014	1008	1014	1016	1005	1002	1005	999	998	994	981	974	973	979	980	995	998	1004	1005	1008	1010	1018	1019	1008	1004	1000
31	1004	1001	1000	1003	1007	1005	1006	992	987	977	964	964	965	979	983	993	998	1004	1008	1013	1009	1009	1009	1009	1005	995
Mean†	1003	1003	994	1002	1003	1007	1005	999	990	978	964	963	966	974	984	993	1001	1007	1011	1014	1014	1012	1011	1008	1006	996

* Light spot thrown off sheet during magnetic disturbance.

† Mean for 30 days only, 11th omitted.

XXX.—TERRESTRIAL MAGNETIC FORCE: WEST COMPONENT.

Eskdalemuir. (—Y.) *Mean Values for Periods of* 60 *Minutes centred at the Hours of Greenwich Mean Time.* **August, 1919.**

4,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	885	884	892	893	881	867	866	867	862	862	862	874	880	896	911	915	921	895	894	899	900	903	899	900	877	888
2	877	868	846	862	851	861	868	860	858	861	862	865	878	896	909	915	919	917	910	900	892	884	867	879	871	879
3	872	859	857	848	848	843	856	852	847	848	850	862	882	906	912	915	917	911	903	899	895	889	888	877	873	877
4	873	870	869	872	871	867	857	850	845	848	861	872	887	906	910	912	916	912	895	897	883	892	895	882	879	881
5	879	875	873	871	869	866	858	857	856	861	873	891	912	920	925	905	904	894	888	885	889	884	873	866	862	882
6	862	852	863	861	858	854	850	862	866	868	869	879	895	903	910	900	902	893	894	890	890	886	885	885	883	879
7	883	879	878	873	872	862	853	852	848	856	870	879	899	902	902	901	895	895	891	882	877	873	876	858	869	877
8	869	866	863	863	857	852	852	843	847	856	873	894	907	920	938	937	913	896	894	889	884	879	874	879	879	881
9	880	895	887	874	871	865	859	854	854	863	874	895	907	924	922	913	898	890	880	878	882	880	881	884	883	884
10	883	880	875	874	871	861	854	850	851	859	874	891	907	921	916	913	903	894	890	891	890	885	888	886	887	884
11	887	889	883	878	853	857	853	890	*	*	854	870	904	897	983	997	1002	1054	1012	958	939	900	875	895	928	—
12	928	863	839	897	799	761	772	795	806	848	855	875	899	909	911	918	919	903	911	872	869	864	865	864	864	863
13	864	864	863	858	854	853	848	847	847	848	854	868	879	881	880	874	864	862	865	869	870	869	867	864	862	863
14	862	859	858	858	857	852	846	839	838	842	849	864	890	907	906	898	890	885	880	878	874	872	869	869	869	869
15	869	871	858	862	862	857	849	841	837	837	852	868	890	908	919	912	903	896	888	895	885	890	868	854	843	873
16	843	822	818	851	858	864	854	853	853	855	864	879	897	912	916	912	905	900	900	896	886	871	874	874	867	874
17	868	850	838	852	860	849	843	838	845	850	858	871	891	909	915	907	896	885	881	881	876	871	865	854	858	869
18	858	865	870	870	871	865	858	864	871	865	867	872	886	907	912	906	897	886	882	888	893	895	891	877	842	880
19	842	839	841	873	904	870	875	855	856	854	859	891	892	881	901	913	911	896	881	881	849	862	860	874	885	874
20	885	864	864	855	863	873	854	851	827	844	855	866	887	896	902	902	885	881	875	873	859	870	871	875	882	870
21	882	881	898	866	859	855	848	839	833	833	845	868	888	904	902	891	880	871	872	875	876	878	881	881	881	871
22	881	883	876	865	864	865	874	851	848	853	874	890	901	908	908	892	888	880	870	877	883	886	876	881	884	878
23	884	880	865	859	855	852	848	848	852	860	876	896	906	907	920	902	889	876	886	887	887	881	881	871	860	877
24	860	864	869	868	865	860	855	858	857	857	865	876	896	908	907	899	891	881	883	884	884	881	880	876	876	876
25	876	871	870	870	870	865	854	845	839	839	859	885	901	908	908	902	892	881	881	887	884	881	864	843	848	873
26	848	842	849	844	839	839	854	854	855	859	865	891	925	938	945	941	923	908	897	886	876	879	871	875	870	880
27	871	872	869	871	856	845	850	868	871	866	880	883	901	908	910	908	893	892	887	887	885	882	876	877	874	880
28	874	874	872	875	875	865	855	850	849	855	868	877	897	921	927	930	920	908	903	900	897	869	851	845	825	881
29	825	857	865	857	851	840	844	844	842	850	871	902	915	924	921	908	896	882	877	882	882	882	882	877	872	875
30	872	872	876	869	875	876	860	856	855	860	875	887	901	913	906	898	890	883	877	879	882	877	872	861	871	878
31	871	871	867	877	867	865	860	856	860	860	872	892	909	922	913	907	890	885	883	881	879	876	876	876	867	880
Mean†	871	866	864	866	862	856	852	850	849	854	864	880	897	909	913	908	900	891	887	886	882	880	876	872	869	876

* Light spot thrown off sheet during magnetic disturbance.

† Mean for 30 days only, 11th omitted.

XXXI.—TERRESTRIAL MAGNETIC FORCE: VERTICAL COMPONENT.

Eskdalemuir. (Z.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **August, 1919.**

44,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1121	1122	1122	1121	1114	1115	1116	1114	1113	1114	1110	1102	1098	1102	1113	1123	1130	1152	1161	1155	1145	1135	1130	1121	1119	1123
2	1119	1106	1106	1117	1121	1121	1117	1120	1121	1119	1118	1115	1109	1107	1111	1119	1125	1129	1130	1132	1130	1129	1126	1123	1117	1120
3	1117	1104	1100	1089	1095	1102	1102	1101	1106	1110	1112	1110	1103	1098	1103	1110	1117	1122	1123	1123	1123	1126	1123	1122	1121	1110
4	1121	1119	1119	1117	1118	1120	1121	1120	1117	1114	1113	1107	1102	1098	1106	1110	1121	1130	1142	1139	1137	1129	1121	1121	1118	1119
5	1118	1118	1119	1118	1117	1117	1117	1117	1113	1110	1106	1103	1097	1099	1113	1125	1123	1121	1117	1116	1115	1118	1111	1102	1098	1113
6	1098	1102	1106	1110	1111	1111	1110	1107	1104	1103	1101	1097	1094	1095	1103	1110	1110	1116	1120	1121	1119	1117	1115	1113	1110	1108
7	1110	1110	1110	1111	1113	1113	1113	1113	1113	1109	1100	1098	1097	1104	1112	1117	1122	1125	1125	1127	1133	1130	1123	1112	1094	1114
8	1094	1082	1098	1104	1106	1108	1109	1113	1110	1106	1108	1103	1096	1092	1100	1117	1133	1137	1129	1122	1120	1119	1115	1113	1112	1110
9	1111	1112	1096	1098	1105	1111	1113	1113	1112	1109	1105	1102	1101	1105	1117	1125	1129	1127	1127	1124	1118	1116	1116	1114	1114	1113
10	1114	1115	1116	1116	1116	1117	1116	1116	1112	1108	1101	1097	1094	1093	1098	1102	1108	1110	1111	1110	1112	1113	1112	1112	1111	1109
11	1110	1108	1106	1096	1092	1092	1094	1096	1083	1085	1051	1060	1096	1123	1140	1306	*	*	1338	1271	1178	1169	1179	1061	932	—
12	932	1016	911	895	952	1059	1101	1111	1112	1121	1128	1131	1135	1132	1135	1140	1139	1141	1140	1143	1140	1139	1139	1139	1139	1093
13	1139	1139	1139	1139	1140	1139	1139	1138	1135	1131	1127	1123	1119	1125	1135	1137	1139	1140	1139	1137	1136	1135	1135	1135	1136	1135
14	1135	1135	1136	1135	1135	1136	1136	1135	1134	1129	1122	1118	1112	1113	1116	1124	1129	1134	1132	1131	1132	1130	1130	1130	1128	1129
15	1128	1126	1126	1130	1130	1131	1130	1129	1126	1123	1119	1118	1115	1114	1114	1116	1120	1126	1130	1130	1135	1134	1131	1125	1114	1125
16	1113	1099	1100	1110	1118	1122	1126	1126	1128	1125	1121	1117	1112	1111	1116	1125	1132	1134	1136	1135	1134	1133	1130	1128	1126	1122
17	1126	1111	1110	1113	1115	1115	1117	1117	1113	1111	1113	1108	1101	1099	1104	1113	1120	1126	1129	1127	1127	1130	1133	1133	1129	1117
18	1128	1124	1123	1123	1124	1125	1125	1124	1120	1118	1118	1116	1110	1105	1105	1110	1120	1132	1133	1128	1124	1122	1122	1116	1081	1120
19	1080	1082	1097	1105	1052	1028	1051	1071	1092	1104	1112	1117	1131	1151	1156	1108	1151	1156	1167	1163	1151	1123	1125	1123	1116	1113
20	1115	1090	1101	1105	1106	1099	1115	1120	1126	1128	1122	1122	1122	1119	1124	1137	1153	1151	1146	1140	1140	1134	1129	1127	1123	1124
21	1122	1121	1110	1113	1124	1129	1131	1132	1130	1127	1121	1114	1106	1107	1117	1122	1125	1127	1128	1125	1125	1125	1125	1125	1125	1122
22	1124	1122	1120	1120	1122	1121	1116	1120	1124	1123	1117	1113	1109	1116	1127	1130	1133	1137	1139	1135	1129	1126	1128	1128	1125	1124
23	1124	1119	1108	1115	1119	1123	1125	1125	1123	1116	1116	1115	1115	1115	1127	1155	1165	1159	1140	1132	1131	1134	1123	1111	1111	1126
24	1110	1114	1117	1121	1122	1123	1123	1122	1119	1115	1114	1110	1107	1107	1114	1120	1122	1122	1122	1121	1120	1121	1122	1122	1122	1118
25	1121	1121	1121	1121	1121	1121	1121	1123	1124	1119	1111	1103	1102	1109	1113	1121	1125	1126	1125	1121	1126	1130	1129	1109	1111	1119
26	1109	1108	1107	1107	1103	1103	1103	1104	1103	1103	1100	1097	1099	1115	1130	1143	1156	1163	1171	1167	1151	1139	1131	1123	1120	1123
27	1118	1117	1113	1105	1097	1102	1109	1110	1109	1113	1114	1113	1117	1123	1130	1141	1144	1141	1133	1129	1128	1125	1125	1122	1121	1120
28	1120	1121	1121	1120	1117	1118	1121	1121	1120	1120	1118	1112	1107	1108	1116	1124	1125	1129	1133	1128	1124	1125	1125	1116	1100	1120
29	1099	1111	1116	1119	1117	1111	1111	1108	1109	1103	1100	1095	1096	1103	1115	1124	1127	1124	1123	1119	1119	1119	1119	1119	1118	1117	1113
30	1115	1117	1115	1114	1113	1114	1116	1115	1112	1110	1109	1105	1102	1101	1106	1112	1119	1123	1126	1122	1121	1119	1113	1111	1113	1114
31	1111	1113	1115	1111	1111	1115	1115	1115	1112	1111	1107	1099	1095	1099	1108	1116	1124	1130	1127	1120	1120	1119	1119	1119	1119	1114
Mean†	1110	1110	1107	1107	1108	1112	1115	1117	1116	1115	1113	1109	1107	1109	1116	1123	1130	1133	1133	1131	1129	1126	1124	1120	1116	1118

* Light spot thrown off sheet during magnetic disturbance.

† Mean for 30 days only, 11th omitted.

XXXII.—AUXILIARY OBSERVATIONS IN ABSOLUTE MEASURE; DAILY VALUES OF TEMPERATURE IN

Eskdalemuir. THE EAST ROOM OF MAGNET HOUSE; MAGNETIC NOTES FOR THE MONTH. **August, 1919.**

Date	Time G.M.T. From	Time G.M.T. To	Horizontal Force.	Declination.	Dip.	Temperature in Magnet House.	Magnetic Character of day (0–2).	Date.
Aug.	h. m.	h. m.	γ	° ′ ″	° ′	a		
						280+		
						5·6	I	1
						5·7	I	2
						5·7	I	3
						5·8	I	4
						5·8	I	5
6	15 34	16 21	16765	17 0 28	69 37·9	5·8	0C	6
						5·8	0	7
						5·9	I	8
						6·0	0C	9
						6·0	0	10
						6·0	2D	11
						6·0	2D	12
13	14 45	15 17	16708	16 58 3	69 42·3	6·0	0C	13
						6·1	0C	14
						6·1	I	15
						6·1	0	16
						6·1	I	17
18	14 20	15 28	16712	17 5 47	69 40·3	6·2	I	18
						6·1	2D	19
						6·2	1D	20
						6·2	0	21
						6·2	0	22
						6·4	I	23
						6·4	0	24
						6·4	I	25
						6·4	I	26
27	10 10	10 35	16687	16 59 10	69 41·1	6·5	0	27
						6·5	1D	28
						6·6	0	29
						6·6	0	30
						6·9	0C	31

MAGNETIC NOTES.

August, 1919.

Except for the very large disturbance of 11th to 12th, the month was moderately quiet. The storm in question, which began at 11d. 6h. 58m., was one of the largest yet recorded at Eskdalemuir. In addition to the description given in *Nature*, 28th August, 1919, the following points may be noted. (1) The exceptionally large and rapid movements on N. in the "sudden commencement," much too rapid to be photographed; (2) the intense agitations on the horizontal traces except during the interval 20h. to 23h. on 11th; (3) the steadiness of V. during that interval; (4) The changes in V. which occurred during the first two hours of the storm and which were of a magnitude never recorded before at Eskdalemuir; (5) the rapid fall, 242 γ in 10 minutes, of V. beginning at 23h. on 11th; (6) the pulsations on the V. trace during the period (4h. to 8h. on 12th) of recovery to normal; (7) the sudden cessation of the storm soon after 19h. on 12th. The range of disturbance during this storm was, N., > 615 γ; W., > 438 γ; V., > 499 γ. Another storm of much less intensity began with a sudden commencement at 18d. 20h. 56m., near the end of which, at 20d. 15h. 11m., there is shewn a sharp rise in N. and W. which resembled a "sudden commencement." A similar movement, ushering in a slight disturbance, is also shown at 28d. 12h. 59m.

XXXIII.—TERRESTRIAL MAGNETIC FORCE: NORTH COMPONENT.

Eskdalemuir. (X.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **September, 1919.**

15,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1005	1005	1003	1003	1007	1006	1004	1003	996	993	981	979	981	985	988	990	995	1005	1008	1018	1014	1014	1009	1006	1005	1000
2	1005	1008	1004	1004	1004	1006	1004	1006	1004	995	984	979	984	1010	1012	1024	1029	1012	1023	1019	1033	1087	971	955	985	1006
3	985	994	993	999	978	979	990	985	979	971	964	961	964	970	984	999	1008	1018	1019	1003	988	980	974	989	970	986
4	970	984	1008	1009	1002	993	994	992	970	940	928	933	936	957	955	964	974	1000	1003	1004	1004	1014	999	997	999	981
5	999	1003	999	999	998	1001	1005	999	993	979	964	954	953	963	970	974	984	994	1004	1004	1004	1004	1004	1009	999	990
6	999	999	1010	1038	1032	1005	984	969	954	922	920	930	936	944	950	964	973	974	973	998	1004	977	964	943	939	972
7	939	953	999	1018	1008	993	991	988	979	969	964	964	975	994	994	994	979	985	998	999	1004	1000	999	1004	1001	988
8	1001	999	1000	998	1004	1000	998	989	979	974	970	975	980	998	1000	1000	1004	1011	1018	1004	1013	1011	994	999	998	997
9	998	1003	1004	1003	1000	1001	998	990	979	969	964	968	974	984	1005	1012	1032	1033	1018	1003	981	1003	974	984	981	995
10	981	985	984	988	989	985	985	984	975	964	954	957	961	968	983	980	989	998	994	1004	1013	1013	984	984	1012	984
11	1012	1008	1000	1004	1010	1008	1009	989	979	964	945	940	941	959	969	984	993	994	997	999	1000	1003	1001	1004	1005	988
12	1005	1000	995	999	1003	1004	1004	998	987	974	959	950	956	965	979	996	998	1004	1014	1014	1013	1013	1013	1011	1008	994
13	1008	1009	1008	1012	1012	1009	1008	1004	992	978	969	963	964	976	980	986	995	1003	1008	1000	1000	989	999	998	999	994
14	999	991	994	996	998	997	994	994	990	980	965	956	960	954	971	974	1004	1018	999	995	995	999	1004	1003	1001	989
15	1001	996	994	992	997	1010	1004	987	985	979	965	945	944	960	980	984	999	999	1003	998	1003	1018	1012	1011	1007	990
16	1007	1004	999	1016	983	992	1024	1013	996	989	969	955	956	974	960	997	988	1001	1004	999	994	995	998	1003	999	992
17	999	999	988	999	1000	1002	1004	989	985	978	960	936	963	971	979	979	989	1001	994	1005	1010	1005	1004	1004	1006	989
18	1006	1004	1011	1000	1009	1029	1005	1001	994	989	974	959	961	955	964	969	990	993	1003	1010	1018	1020	1023	1031	987	996
19	987	999	1018	985	1007	1008	998	979	944	935	929	932	931	964	994	1029	1033	1061	1009	990	936	956	895	896	909	974
20	909	857	962	986	960	940	935	935	931	921	930	946	935	944	968	963	976	989	979	974	974	960	959	973	988	952
21	988	974	941	1003	1000	1004	993	958	978	969	965	949	964	960	966	979	969	981	992	994	995	1013	1000	991	995	980
22	994	995	994	992	994	998	984	994	987	973	959	954	958	972	979	989	994	984	990	1001	1013	983	986	988	987	985
23	987	993	997	1002	1004	1007	1012	1007	1001	987	968	958	957	965	979	989	1011	999	1008	1004	1012	1017	1013	1006	1039	996
24	1039	1011	994	993	1003	1021	1026	992	992	997	979	963	956	967	977	987	985	988	980	1018	987	980	998	1005	1002	992
25	1002	1004	1003	972	997	1008	1001	975	970	969	957	965	969	963	982	968	962	986	998	1009	998	998	998	998	997	985
26	997	995	994	995	994	994	994	993	984	975	963	954	948	954	961	964	978	997	998	1003	998	1002	1004	1028	1017	987
27	1017	995	995	997	1003	992	1003	1003	997	987	972	957	957	962	968	977	983	993	1002	996	995	998	999	998	*998*	989
28	*	*	*	*	*	*	*	*	*	*	966	966	969	976	988	997	993	1002	1003	1004	1006	1011	1007	1000	998	—
29	998	*	*	*	*	*	*	*	*	*	961	959	959	965	973	983	990	993	997	999	1003	989	992	998	996	—
30	995	994	996	996	996	997	997	995	990	976	961	948	950	956	965	978	992	1001	1006	1009	1012	1011	1010	1008	1008	989
Mean†	993	991	996	1000	1000	1000	998	989	981	971	960	955	958	968	978	986	993	1001	1001	1003	1001	1002	992	994	994	988

* Sheet fogged.

† Mean for 27 days only, 27th, 28th and 29th omitted.

XXXIV.—TERRESTRIAL MAGNETIC FORCE: WEST COMPONENT.

Eskdalemuir. (—Y.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **September, 1919.**

4,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	867	867	866	865	861	854	854	852	855	861	870	879	894	900	898	897	897	892	885	888	881	879	882	877	872	876
2	872	871	866	867	866	861	861	862	866	871	872	878	891	916	918	928	929	924	919	882	903	823	827	813	780	877
3	780	833	844	844	846	855	855	850	851	853	860	876	899	920	927	924	914	909	898	881	860	840	840	849	843	868
4	843	815	819	824	850	861	856	856	860	867	877	896	908	915	915	908	896	877	870	866	861	856	856	859	866	868
5	866	861	866	860	868	866	860	855	855	856	866	878	893	903	903	898	888	876	875	876	879	876	871	860	855	873
6	855	874	888	847	861	871	882	874	856	856	859	885	897	913	914	911	903	903	882	866	876	876	839	828	859	876
7	859	789	800	819	843	849	847	842	844	847	860	878	892	903	908	903	886	877	876	844	871	876	876	876	876	861
8	876	876	871	862	862	861	856	851	850	850	862	887	897	902	898	887	885	883	884	864	883	860	855	861	861	872
9	861	866	866	866	863	859	851	845	840	845	860	886	909	914	919	914	918	899	856	861	839	860	824	819	844	868
10	844	858	855	850	839	847	839	839	834	835	846	873	893	903	908	891	882	876	875	883	889	871	824	859	861	863
11	861	853	858	861	861	860	856	850	850	859	865	881	899	908	903	892	882	875	874	876	875	872	871	875	872	872
12	872	866	871	872	871	866	860	852	848	846	859	876	892	902	903	899	886	881	882	886	882	881	879	876	877	875
13	877	876	866	866	864	863	861	855	850	848	859	876	897	913	911	909	908	898	861	864	869	866	861	856	844	873
14	844	869	866	864	866	860	853	855	851	861	862	881	898	895	908	900	876	881	886	879	865	867	876	871	872	873
15	872	866	870	871	871	871	860	866	871	865	871	893	894	903	909	909	908	898	903	866	872	879	871	864	865	880
16	865	877	864	824	860	900	886	877	877	868	868	871	882	898	893	904	888	877	872	866	871	860	867	866	866	874
17	866	867	886	872	873	866	850	846	860	861	865	872	885	894	898	886	882	882	875	866	871	868	871	871	873	872
18	873	876	886	861	882	887	850	852	850	849	861	871	887	887	893	886	883	886	882	876	876	872	852	816	828	870
19	828	834	827	813	833	862	886	892	893	877	894	899	908	928	929	965	944	903	908	822	823	813	808	718	774	866
20	774	812	780	807	838	860	850	860	850	851	856	866	887	892	899	902	888	882	882	876	866	857	844	839	834	856
21	834	818	876	839	851	862	887	897	862	849	860	868	888	892	892	892	872	876	872	876	873	855	842	839	846	866
22	846	845	849	855	859	861	876	861	855	854	865	882	898	898	898	891	881	867	866	871	841	855	838	845	824	864
23	824	857	869	865	865	866	861	856	851	849	854	869	887	903	904	898	905	892	897	887	849	875	876	867	865	873
24	865	764	770	807	860	850	860	880	902	852	861	871	877	902	930	926	887	920	914	860	877	876	871	865	859	869
25	859	862	815	860	838	855	858	845	854	855	876	879	894	892	913	908	897	891	877	863	876	875	865	865	862	870
26	862	855	857	857	857	860	860	857	855	854	863	868	888	892	897	898	885	880	874	877	876	876	872	867	863	870
27	863	857	857	854	867	853	859	856	855	855	*	*	*	*	*	*	*	*	*	*	*	*	871	904	903	—
28	903	866	866	866	867	866	866	859	847	845	*	*	*	*	*	*	*	*	*	*	875	874	866	845	839	—
29	839	847	866	866	861	860	862	854	846	844	851	866	882	892	897	896	891	889	888	890	874	855	869	864	859	869
30	859	863	867	867	866	866	862	859	852	850	855	864	880	893	897	892	888	887	885	882	880	876	873	872	872	873
Mean†	852	851	853	851	858	863	861	859	857	855	864	878	893	903	907	904	895	889	883	871	870	864	857	851	852	870

* Sheet fogged.

† Mean for 27 days only, 27th, 28th and 29th omitted.

XXXV.—TERRESTRIAL MAGNETIC FORCE: VERTICAL COMPONENT.

Eskdalemuir. (Z.) *Mean Values for Periods of* 60 *Minutes centred at the Hours of Greenwich Mean Time.* **September, 1919.**

44,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1117	1117	1117	1117	1115	1115	1116	1114	1114	1111	1105	1099	1097	1101	1106	1109	1113	1115	1116	1114	1117	1115	1114	1114	1114	1112
2	1112	1112	1112	1111	1111	1111	1111	1111	1108	1107	1103	1100	1099	1096	1099	1100	1107	1111	1120	1144	1134	1123	1067	1046	1004	1104
3	1001	1077	1104	1105	1100	1102	1108	1110	1109	1109	1112	1105	1100	1104	1110	1116	1129	1140	1148	1152	1148	1136	1124	1116	1070	1112
4	1069	1036	1064	1069	1088	1101	1110	1111	1104	1103	1096	1095	1096	1099	1105	1113	1124	1144	1144	1140	1134	1115	1105	1107	1107	1104
5	1105	1105	1105	1105	1106	1108	1109	1110	1110	1105	1103	1101	1101	1103	1110	1117	1118	1125	1122	1117	1113	1113	1113	1107	1101	1110
6	1099	1091	1064	1059	1059	1064	1073	1079	1089	1096	1109	1108	1109	1118	1127	1135	1151	1163	1175	1167	1148	1124	1087	1020	953	1102
7	950	1005	1065	1085	1096	1104	1108	1109	1109	1109	1104	1096	1092	1092	1096	1108	1117	1118	1116	1120	1112	1107	1106	1105	1105	1096
8	1103	1099	1094	1095	1098	1101	1102	1102	1102	1100	1098	1096	1095	1099	1098	1096	1100	1102	1105	1112	1105	1106	1106	1104	1104	1101
9	1101	1101	1099	1100	1099	1099	1100	1100	1100	1091	1084	1079	1079	1083	1087	1095	1111	1151	1168	1167	1151	1105	1073	1095	1099	1105
10	1097	1105	1109	1108	1107	1109	1109	1109	1107	1101	1098	1093	1089	1092	1101	1110	1109	1107	1102	1101	1105	1110	1109	1105	1098	1104
11	1096	1103	1103	1103	1100	1100	1099	1100	1097	1095	1094	1087	1083	1084	1092	1099	1103	1103	1098	1098	1099	1099	1100	1099	1096	1097
12	1095	1092	1095	1095	1095	1097	1099	1102	1102	1100	1094	1090	1086	1087	1090	1094	1096	1094	1091	1091	1094	1094	1094	1095	1095	1094
13	1093	1086	1083	1084	1086	1089	1092	1094	1094	1092	1088	1080	1074	1076	1084	1088	1093	1097	1120	1129	1123	1120	1106	1097	1096	1095
14	1094	1094	1095	1095	1094	1094	1094	1090	1085	1080	1076	1076	1079	1086	1090	1097	1112	1123	1122	1122	1122	1113	1102	1094	1094	1097
15	1092	1092	1092	1088	1082	1082	1086	1088	1085	1085	1084	1084	1085	1086	1089	1098	1115	1126	1126	1141	1124	1101	1085	1084	1084	1096
16	1083	1076	1056	1039	1052	1048	1044	1052	1059	1067	1075	1080	1087	1096	1099	1099	1101	1099	1101	1109	1108	1107	1103	1096	1093	1081
17	1091	1089	1081	1073	1074	1077	1079	1085	1083	1081	1080	1080	1073	1077	1081	1085	1086	1090	1094	1097	1093	1093	1090	1089	1086	1084
18	1084	1077	1059	1071	1071	1059	1060	1071	1076	1078	1079	1076	1075	1079	1084	1088	1096	1099	1099	1095	1091	1090	1087	1075	1054	1079
19	1052	1030	1005	1019	1016	992	998	1007	1017	1033	1046	1057	1071	1113	1161	1198	1256	1256	1204	1148	1085	1037	923	936	917	1066
20	915	868	892	957	964	966	1013	1055	1072	1079	1086	1104	1106	1110	1122	1142	1159	1158	1155	1150	1135	1115	1103	1080	1044	1065
21	1043	1043	1011	1025	1058	1064	1064	1059	1066	1074	1076	1078	1079	1084	1094	1103	1110	1101	1095	1094	1094	1091	1079	1078	1082	1074
22	1081	1081	1077	1080	1081	1079	1075	1069	1073	1073	1069	1065	1065	1069	1071	1075	1083	1089	1086	1086	1089	1083	1085	1077	1069	1077
23	1068	1073	1079	1080	1080	1079	1079	1081	1080	1076	1074	1070	1061	1058	1064	1072	1076	1078	1084	1088	1099	1092	1090	1088	1060	1078
24	1059	1039	1039	1047	1053	1063	1071	1071	1063	1061	1065	1071	1072	1071	1087	1136	1142	1130	1155	1163	1094	1099	1099	1090	1074	1085
25	1073	1069	1051	994	1035	1058	1063	1070	1072	1070	1067	1067	1066	1068	1072	1082	1090	1090	1101	1100	1094	1091	1091	1086	1085	1072
26	1084	1084	1085	1085	1084	1082	1081	1081	1079	1076	1072	1064	1067	1075	1079	1083	1086	1089	1089	1086	1085	1084	1083	1076	1059	1080
27	1058	1064	1073	1076	1069	1061	1064	1068	1070	1072	*	*	*	*	*	*	*	*	*	*	*	*	1083	1082	1082	—
28	1081	1080	1080	1082	1080	1080	1081	1083	1084	1083	*	*	*	*	*	*	*	*	*	*	*	1081	1083	1079	1076	—
29	1075	1077	1078	1078	1079	1080	1081	1082	1082	1081	1081	1075	1070	1067	1070	1074	1078	1082	1084	1086	1090	1094	1090	1086	1085	1080
30	1084	1081	1081	1082	1081	1080	1081	1081	1082	1080	1077	1074	1069	1069	1070	1074	1078	1077	1074	1074	1074	1076	1076	1075	1075	1077
Mean†	1072	1071	1071	1073	1077	1079	1082	1086	1087	1086	1086	1084	1084	1088	1095	1104	1113	1118	1119	1119	1110	1101	1089	1083	1071	1091

†Mean for 27 days only, 27th, 28th and 29th omitted. *Sheet fogged.

XXXVI.—AUXILIARY OBSERVATIONS IN ABSOLUTE MEASURE; DAILY VALUES OF TEMPERATURE IN THE EAST ROOM OF MAGNET HOUSE; MAGNETIC NOTES FOR THE MONTH.

Eskdalemuir. **September, 1919.**

Date	Time G.M.T. From	Time G.M.T. To	Horizontal Force.	Declination.	Dip.	Temperature in Magnet House.	Magnetic Character of day (0–2).	Date.
Sept.	h. m.	h. m.	γ	° ′ ″	° ′	a 280+		
						6·9	0C	1
						6·8	2D	2
3	10 33	10 50	16692	16 58 3	69 42·1	6·9	1	3
						6·9	1	4
						6·9	0C	5
						6·8	1D	6
						6·8	1	7
						6·8	0	8
						6·8	1	9
						6·9	1	10
11	10 33	11 4	16672	17 1 25	69 43·2	6·9	1	11
						6·9	0C	12
						6·9	1	13
						6·9	0	14
						7·0	1	15
						7·0	1	16
17	10 18	10 51	16662	16 58 53	69 41·7	7·0	1	17
						7·0	1	18
						7·0	2D	19
						7·0	2D	20
						7·0	1	21
						7·0	1	22
						7·0	1	23
						7·1	2D	24
						7·1	1	25
						7·1	1	26
						7·2	0	27
						7·3	0C	28
						7·4	0	29
						7·4	0C	30

MAGNETIC NOTES.

September, 1919.

The month was one of high average activity, but the contributions to this result were mainly confined to the 2nd, 6th to 7th, 19th to 20th, and 24th. The first disturbance showed a sudden commencement at 2d. 12h. 22m., a noticeable feature in this movement being that, on W., the first portion (directed eastwards) was nearly as large as the subsequent excursion westwards from the undisturbed value. N. shewed no similar phenomenon. The maximum on N. and V. and the minimum on W. occurred simultaneously about 2d. 21h. The rise in V. was late in beginning but the minimum was reached before 24h. on 2nd. The second and the largest storm of the month, began with a sudden commencement at 18d. oh. 9m., but the main portion did not develop until 19d. 17h. and lasted until 20d. 2h. Note quiescent interval centering at 19d. 20h. during which there was a check in the fall of V. The V. trace showed a much larger number of peaks than usual. Note also the occurrence of intense activity on N. about 24h. on 19th. A sharp movement on all three traces at 30d. 16h. 12m. simulates a sudden commencement. But whether it was associated with the large disturbance which began 24 hours later seems doubtful, for the traces were quiet in the interval.

XXXVII.—TERRESTRIAL MAGNETIC FORCE: NORTH COMPONENT.

Eskdalemuir. (X.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **October, 1919.**

15,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1008	1004	1002	1002	1005	1006	1009	1005	996	989	977	969	968	972	982	991	*	1053	1061	1030	992	911	957	821	<634	—
2	<634	771	840	889	936	967	955	948	947	948	943	937	929	942	953	958	976	982	968	974	972	977	982	978	977	<936
3	977	978	983	988	982	963	947	884	857	909	950	949	940	934	938	956	966	981	981	990	988	980	1022	1005	979	960
4	978	972	973	974	976	989	996	998	992	981	968	960	955	961	941	972	986	990	1003	999	989	981	937	977	983	977
5	983	996	951	953	965	981	983	967	983	988	989	987	981	990	1003	1021	1107	1162	1008	973	1016	1016	985	956	972	997
6	971	965	931	961	922	937	962	986	966	960	936	933	936	945	954	958	965	971	977	989	1014	1000	992	1003	980	964
7	980	977	972	966	975	981	980	981	971	963	961	956	955	966	965	984	985	997	986	995	1024	1018	1009	992	996	977
8	996	1001	965	975	989	991	993	991	990	985	975	960	945	961	976	982	987	990	991	994	995	996	1036	1025	980	987
9	979	985	986	989	984	989	993	988	993	974	960	930	942	933	975	965	982	992	980	997	1004	1014	996	996	995	981
10	995	995	989	987	989	992	991	991	988	974	939	930	956	965	969	977	982	988	991	993	994	1000	1013	990	1003	983
11	1002	992	983	970	995	1006	998	998	1005	988	978	964	958	965	973	974	983	988	990	992	997	998	999	1009	1004	988
12	1004	995	996	995	994	997	1000	1003	1002	993	981	967	964	964	979	983	988	993	998	1002	999	1008	1002	998	998	992
13	998	994	993	997	998	1000	1002	1000	988	977	962	961	964	969	978	987	990	989	989	990	994	1012	1003	999	998	989
14	997	997	999	1001	1002	1004	1008	1006	999	987	967	959	962	966	976	984	992	995	999	1003	1002	1006	1008	1007	1006	993
15	1006	1003	1001	1001	1006	1009	1007	999	998	994	987	978	971	965	965	978	992	993	991	999	997	1001	997	1001	1002	993
16	1001	993	1002	1005	1006	972	934	963	961	961	954	957	961	962	967	979	978	990	986	992	986	976	977	991	988	977
17	988	986	999	986	997	988	986	980	981	976	965	954	946	955	967	971	966	976	982	1006	957	966	968	986	985	976
18	984	997	985	992	999	991	960	980	968	961	955	951	941	952	953	956	973	973	974	976	987	989	997	989	989	974
19	989	987	985	988	987	989	997	995	977	970	958	960	955	955	956	960	961	976	990	992	992	996	1000	998	993	980
20	992	988	989	992	994	994	996	999	993	979	959	960	956	953	969	980	977	994	994	994	998	999	999	999	1003	986
21	1003	1008	998	994	996	1002	1003	1000	992	984	973	965	964	968	970	986	995	998	1000	1004	1004	1002	1004	1004	1004	992
22	1003	1003	1003	1005	1008	1012	1017	1017	1008	983	973	968	962	938	956	960	970	975	982	989	999	999	997	986	988	988
23	988	987	996	973	950	999	963	940	946	980	963	951	948	954	963	969	977	977	980	982	982	979	988	979	991	971
24	990	973	969	966	981	988	987	989	984	978	966	957	957	965	979	982	983	985	991	991	995	993	992	993	991	981
25	991	992	992	991	992	993	995	994	987	977	967	959	958	964	972	982	982	992	987	997	998	999	997	998	999	986
26	998	991	991	993	994	993	996	996	994	987	969	961	960	968	980	1015	1015	1016	1015	990	977	976	983	988	986	989
27	986	988	975	1014	979	989	991	973	983	976	953	946	948	959	975	985	988	989	992	991	991	991	999	991	997	977
28	996	990	995	990	995	1004	1002	960	996	990	966	927	935	950	952	969	978	972	971	992	1013	1030	968	974	991	980
29	991	970	985	992	987	989	991	983	962	950	952	941	942	954	963	960	966	963	970	983	983	985	985	989	988	972
30	987	985	986	979	983	990	994	991	987	973	958	958	956	954	968	976	982	984	991	987	976	998	976	978	983	979
31	983	984	987	1000	1001	978	982	982	982	971	959	956	956	958	964	972	978	983	985	984	984	988	988	985	986	979
Mean†	991	989	985	987	987	990	988	984	980	975	964	955	954	958	967	977	985	992	989	992	994	996	993	993	992	982

† Mean for 29 days only, 1st and 2nd omitted. * Light spot thrown off sheet during magnetic disturbance.

XXXVIII.—TERRESTRIAL MAGNETIC FORCE: WEST COMPONENT.

Eskdalemuir. (—Y.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **October, 1919.**

4,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	872	871	871	871	870	866	856	850	845	842	853	865	880	890	896	897	900	918	852	876	872	827	848	672	637	856
2	637	715	780	833	820	840	834	826	826	828	837	852	863	874	881	878	876	874	864	839	871	866	865	864	863	840
3	862	860	861	858	848	865	907	895	860	850	856	863	873	876	873	887	882	885	868	876	874	862	824	870	853	868
4	853	859	860	854	857	864	862	858	849	845	856	865	882	902	898	909	920	858	891	879	838	813	877	782	837	863
5	837	824	818	837	832	828	830	848	847	846	855	875	893	899	910	937	986	992	906	908	910	902	867	857	858	877
6	858	858	893	859	833	842	850	842	837	838	849	854	863	901	879	875	865	860	858	855	846	843	842	860	868	857
7	868	860	860	860	865	857	854	850	849	845	852	860	879	890	893	881	881	850	863	863	862	856	856	852	863	863
8	863	838	843	861	858	855	852	850	843	842	853	865	871	886	892	891	881	878	874	871	874	865	842	831	812	861
9	812	850	859	855	860	862	858	865	859	861	859	864	879	892	908	862	854	869	888	873	865	858	859	865	874	865
10	874	870	865	862	864	863	859	855	845	847	852	870	875	890	892	891	881	877	875	873	870	860	860	844	864	867
11	863	857	865	879	874	856	858	856	854	843	842	858	870	887	894	894	890	880	876	871	868	867	860	853	863	867
12	863	859	861	861	858	863	862	861	854	847	846	859	882	890	905	900	893	883	880	880	874	850	840	839	842	867
13	842	857	862	861	864	864	859	854	848	843	850	858	875	888	895	892	886	878	880	875	869	857	857	865	867	866
14	867	867	869	869	873	874	872	863	852	847	848	864	884	891	896	888	885	890	877	874	874	870	869	867	869	872
15	869	865	862	869	869	866	861	858	856	851	855	864	887	894	896	893	889	880	879	876	845	838	833	825	833	865
16	832	831	825	815	847	851	899	906	872	860	873	878	889	899	899	894	885	887	883	879	865	857	859	858	864	869
17	864	857	858	835	841	851	853	861	856	863	862	877	878	903	911	915	921	911	903	866	866	846	820	826	834	868
18	834	831	828	852	863	863	878	889	865	868	879	894	895	910	907	911	853	880	873	869	868	863	862	860	863	871
19	863	871	865	859	861	861	858	855	852	856	865	872	878	885	888	894	890	874	866	858	862	857	849	857	862	866
20	862	866	864	863	863	862	861	858	850	847	854	868	879	889	891	889	879	864	873	869	863	862	865	864	865	867
21	864	871	864	860	862	862	861	859	852	847	853	866	878	887	881	872	871	872	872	871	869	866	864	865	866	866
22	866	866	867	867	868	867	867	865	855	855	880	896	901	913	881	881	874	867	867	867	868	873	870	868	853	873
23	853	842	830	809	804	808	812	822	818	835	846	857	870	876	879	890	870	871	863	861	861	841	817	843	851	845
24	851	852	870	877	860	853	853	851	845	844	845	856	872	877	879	873	868	866	867	867	867	864	863	863	863	862
25	863	864	862	862	862	862	859	855	846	841	847	861	872	879	878	876	870	870	867	869	867	867	862	860	855	863
26	855	858	860	862	863	862	860	859	851	846	847	858	871	875	877	890	887	890	894	845	815	852	863	871	864	863
27	864	860	867	840	852	844	839	832	840	836	848	856	868	874	874	869	863	864	865	865	866	866	864	865	869	858
28	868	861	867	869	877	866	861	902	872	864	868	861	876	885	892	889	886	883	884	830	832	806	824	837	851	865
29	851	881	864	850	850	852	855	856	852	857	871	873	877	884	894	886	884	852	866	861	860	852	854	855	859	864
30	859	863	860	861	869	859	857	854	850	848	854	867	878	873	880	872	867	868	869	866	850	841	828	813	821	858
31	821	817	817	833	839	884	875	868	852	846	858	862	867	864	862	858	858	861	862	861	866	866	861	854	847	855
Mean†	855	856	857	855	856	857	860	860	851	849	856	866	878	888	890	888	883	878	875	868	863	856	852	851	855	865

† Mean for 29 days only, 1st and 2nd omitted.

XXXIX.—TERRESTRIAL MAGNETIC FORCE: VERTICAL COMPONENT.

Eskdalemuir. (Z.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **October, 1919.**

44,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1074	1074	1074	1072	1068	1068	1071	1072	1075	1072	1066	1064	1061	1061	1062	1064	1070	1084	1238	*	1195	1097	1152	1089	948	—
2	947	894	877	864	1025	1063	1085	1098	1103	1104	1103	1103	1105	1102	1102	1099	1097	1101	1111	1122	1108	1099	1095	1092	1091	1065
3	1091	1090	1089	1087	1083	1071	1040	1029	1041	1064	1073	1078	1082	1091	1098	1099	1095	1103	1104	1100	1099	1099	1087	1069	1074	1081
4	1073	1081	1081	1083	1084	1080	1080	1080	1082	1079	1078	1076	1076	1082	1094	1097	1110	1152	1139	1150	1158	1118	1085	1046	1042	1094
5	1042	1062	1063	1062	1050	1064	1070	1046	1041	1062	1070	1070	1072	1072	1070	1063	1121	1288	1316	1227	1161	1182	1155	1113	1093	1107
6	1093	1079	1045	1014	1016	1042	1071	1085	1094	1095	1089	1092	1093	1094	1094	1095	1098	1098	1098	1097	1092	1086	1080	1055	1058	1078
7	1057	1058	1065	1065	1067	1073	1079	1080	1080	1080	1078	1078	1080	1083	1087	1099	1099	1105	1099	1094	1082	1071	1064	1070	1067	1079
8	1068	1057	1049	1054	1066	1074	1078	1079	1080	1079	1079	1079	1080	1078	1078	1080	1082	1083	1081	1081	1082	1083	1081	1075	1063	1075
9	1063	1044	1048	1052	1068	1073	1076	1075	1074	1071	1071	1079	1082	1085	1091	1121	1136	1118	1100	1097	1092	1081	1078	1079	1077	1082
10	1077	1074	1078	1080	1080	1079	1080	1082	1084	1083	1085	1083	1076	1074	1078	1081	1082	1082	1078	1079	1079	1080	1075	1070	1066	1079
11	1066	1068	1066	1059	1058	1066	1068	1070	1070	1074	1074	1070	1072	1073	1075	1078	1081	1081	1079	1078	1078	1078	1078	1076	1070	1072
12	1070	1071	1074	1074	1074	1074	1073	1074	1075	1074	1073	1069	1064	1064	1066	1071	1075	1078	1078	1077	1078	1078	1077	1074	1074	1073
13	1075	1073	1074	1075	1075	1075	1075	1077	1079	1080	1076	1071	1065	1065	1071	1076	1081	1081	1084	1084	1083	1078	1075	1073	1074	1076
14	1074	1074	1074	1074	1073	1072	1072	1077	1081	1079	1073	1069	1065	1067	1071	1075	1077	1079	1077	1076	1075	1075	1073	1071	1069	1074
15	1069	1068	1070	1069	1069	1067	1068	1071	1070	1069	1063	1059	1057	1063	1065	1067	1072	1079	1082	1081	1082	1079	1065	1063	1060	1069
16	1060	1040	1020	995	991	985	980	987	1023	1040	1052	1059	1067	1071	1075	1079	1087	1085	1082	1081	1086	1092	1086	1080	1076	1050
17	1076	1075	1059	1053	1051	1059	1065	1068	1069	1071	1069	1067	1071	1071	1076	1086	1099	1111	1119	1147	1119	1114	1110	1095	1098	1084
18	1099	1091	1074	1056	1043	1044	1051	1045	1055	1058	1062	1065	1072	1080	1088	1096	1131	1111	1097	1093	1085	1080	1076	1074	1072	1076
19	1072	1070	1069	1069	1069	1069	1069	1071	1075	1072	1072	1070	1072	1074	1080	1084	1084	1078	1080	1081	1080	1080	1080	1077	1074	1075
20	1075	1073	1073	1072	1071	1070	1070	1071	1073	1073	1067	1065	1065	1069	1069	1072	1077	1079	1076	1077	1077	1077	1075	1073	1069	1072
21	1069	1061	1061	1064	1065	1064	1065	1065	1069	1067	1063	1061	1061	1065	1071	1073	1070	1069	1067	1066	1066	1067	1066	1067	1066	1066
22	1066	1066	1065	1064	1062	1060	1059	1059	1061	1062	1057	1056	1068	1087	1088	1083	1079	1076	1073	1070	1068	1069	1071	1074	1078	1069
23	1079	1076	1066	1048	1005	960	970	1001	1030	1054	1062	1062	1065	1068	1072	1074	1074	1074	1073	1072	1073	1081	1078	1073	1065	1053
24	1065	1066	1066	1062	1066	1068	1068	1069	1070	1070	1066	1066	1066	1072	1076	1076	1073	1070	1067	1067	1066	1067	1068	1067	1068	1068
25	1069	1069	1068	1067	1067	1066	1066	1066	1068	1067	1063	1059	1060	1064	1069	1071	1071	1070	1070	1068	1066	1065	1066	1067	1065	1067
26	1065	1067	1066	1066	1065	1064	1063	1062	1062	1062	1062	1060	1059	1061	1062	1062	1060	1058	1061	1108	1120	1089	1075	1071	1071	1069
27	1071	1067	1049	976	981	1005	1019	1014	1031	1048	1056	1058	1059	1061	1063	1065	1065	1064	1064	1063	1063	1063	1064	1064	1061	1047
28	1062	1064	1063	1062	1060	1057	1057	1056	1048	1053	1055	1062	1070	1074	1078	1079	1081	1082	1090	1091	1076	1057	1049	1050	1038	1065
29	1039	1035	1024	1046	1054	1056	1057	1058	1061	1059	1058	1063	1071	1073	1073	1078	1084	1103	1096	1087	1081	1078	1074	1069	1067	1066
30	1067	1066	1065	1064	1063	1066	1067	1068	1068	1068	1065	1064	1065	1071	1072	1072	1071	1070	1069	1071	1077	1057	1053	1060	1058	1066
31	1059	1055	1050	1042	1034	1033	1030	1035	1046	1054	1063	1069	1072	1073	1074	1075	1074	1072	1071	1072	1072	1070	1070	1070	1069	1060
Mean†	1069	1067	1063	1057	1056	1056	1058	1059	1064	1068	1068	1068	1070	1073	1077	1080	1086	1093	1092	1091	1087	1083	1077	1071	1068	1072

†Mean for 29 days only, 1st and 2nd omitted.

*Light spot thrown off sheet during magnetic disturbance.

XL.—AUXILIARY OBSERVATIONS IN ABSOLUTE MEASURE; DAILY VALUES OF TEMPERATURE IN THE EAST ROOM OF MAGNET HOUSE; MAGNETIC NOTES FOR THE MONTH

Eskdalemuir. **October, 1919.**

Date	Time G.M.T. From	Time G.M.T. To	Horizontal Force.	Declination.	Dip.	Temperature in Magnet House.	Magnetic Character of day (0–2).	Date.
Oct.	h. m.	h. m.	γ	° ′ ″	° ′	a 280+		
1	10 18	10 48	16691	16 55 23	69 40·6	7·3	2D	1
						7·3	2	2
						7·3	2D	3
						7·3	2D	4
						7·3	2D	5
						7·3	2	6
7	11 0	11 22	16683	16 57 30	69 41·6	7·3	1	7
						7·2	1	8
						7·2	1	9
						7·2	1	10
						7·3	0	11
						7·2	0C	12
						7·2	0C	13
14	10 40	11 11	16684	16 57 25	69 41·4	7·2	0C	14
						7·0	1	15
						6·9	1	16
						6·9	1	17
						6·9	1	18
						6·8	0	19
						6·7	0	20
21	11 1	12 2	16710	16 58 58	69 40·9	6·7	0C	21
						6·7	1	22
						6·6	2	23
						6·6	0	24
						6·5	0C	25
						6·5	2	26
						6·5	1	27
28	14 25	14 48	16694	17 1 30	69 41·3	6·4	1D	28
						6·4	1	29
						6·4	1	30
						6·4	1	31

MAGNETIC NOTES.

October, 1919.

The first five days, and the 28th, showed disturbance on a considerable scale; the quietest days were 14th, 20th, 21st, 24th, 25th. As a whole, the mean absolute daily range was higher than in any other month of the year, being N., 141 γ; W., 130 γ; V., 91 γ. With the exception of August, 1917, these are the highest mean daily ranges recorded for any month since January, 1911. The disturbance of 1st to 2nd has been referred to in the September *Magnetic Notes*. At the time it began a magnetograph scale test was in progress and there is some doubt as to whether the beginning constituted a "sudden commencement" or not. If it was, it may be put down as at 1d. 16h. 12m. It was followed immediately by a rapid rise in V. and by extensive oscillations on N. and W. The principal movement at about 1d. 22h. was in a direction +N., +W., +V., and was accompanied by rapid pulsationary activity. Comparatively quiet conditions were restored by 2d. 6h. and lasted for 24 hours after which there was a renewal of disturbance, ending in a prominent tooth-like projection on N., a corresponding depression in W., and a comparatively slow fall in V., about 3d. 22h. The next storm followed in a few hours with a sudden commencement at 4d. 4h. 31m., the largest motions being on the 5th. Intense activity is shown on N. and W. for 24 hours, beginning 5d. 8h. Numerous pulsations in V. were recorded while storm was passing away.

XLI.—TERRESTRIAL MAGNETIC FORCE: NORTH COMPONENT.

Eskdalemuir. (**X.**) *Mean Values for Periods of* 60 *Minutes centred at the Hours of Greenwich Mean Time.* **November, 1919.**

15,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	986	987	993	994	990	993	994	996	997	988	973	965	963	964	966	973	978	983	988	991	998	994	994	994	993	985
2	992	993	994	996	998	1001	1002	998	993	981	972	968	969	973	975	981	981	987	991	989	995	991	983	989	997	987
3	997	994	993	994	993	996	998	997	992	987	980	975	974	974	984	993	997	998	1002	1004	1011	1007	1005	1004	1004	994
4	1004	1003	1002	1006	1005	1002	1012	998	994	983	981	983	983	984	977	939	969	1018	934	958	965	967	968	969	975	983
5	974	972	974	972	970	972	972	*	*	*	945	943	956	960	967	972	975	978	981	981	981	981	981	981	982	—
6	982	982	980	980	982	985	987	983	982	977	969	965	965	972	977	982	984	984	985	988	990	989	992	992	990	982
7	989	989	990	991	991	990	991	991	988	981	970	966	971	975	981	990	992	994	995	997	997	996	996	993	996	988
8	996	995	996	992	996	997	1001	1004	1004	996	986	986	990	996	1000	1001	1004	1006	1009	1005	1007	1005	1001	1000	998	999
9	997	994	995	995	996	999	1000	1000	997	987	976	975	979	985	992	994	995	1000	1000	1002	1001	1002	1000	1000	997	994
10	997	999	998	1002	1007	1005	1004	1000	999	992	980	977	977	981	990	998	1002	1006	1008	1006	1004	1006	1001	1001	996	997
11	995	996	998	1001	1006	1008	1007	1010	1008	1000	984	971	971	980	980	992	984	966	956	956	972	989	990	992	992	988
12	992	991	1011	996	1009	986	972	966	960	960	966	965	954	961	969	958	977	981	980	987	987	988	991	991	991	979
13	991	990	990	991	994	998	1000	995	990	991	982	967	966	968	982	992	995	997	997	999	999	999	999	999	998	991
14	997	997	998	999	1001	1002	1004	1005	1002	998	991	987	987	987	992	997	998	1000	1000	1000	992	995	997	998	994	997
15	994	995	998	996	998	998	1000	1000	1002	996	991	983	975	978	986	991	989	996	999	998	1000	1013	1000	998	998	995
16	997	998	1000	1004	1010	1021	1024	1020	1008	992	984	993	994	998	1001	1004	998	971	987	992	1000	1005	998	978	990	999
17	990	975	972	958	970	984	981	977	974	976	976	969	969	974	973	965	982	988	996	992	1000	1024	975	981	972	980
18	972	967	987	987	982	983	984	991	992	986	975	972	969	977	982	977	984	977	994	982	981	989	992	988	991	982
19	990	988	987	988	992	993	993	993	989	984	975	971	971	976	984	991	995	997	998	998	997	995	992	992	994	989
20	994	995	994	996	996	998	1000	1002	998	993	986	985	981	987	997	1000	1000	1000	1000	998	1000	1001	1000	1000	999	996
21	999	1000	1000	1002	1003	1006	1006	1005	1001	995	981	974	979	986	996	1002	1004	1007	1005	1000	996	989	975	993	994	996
22	993	993	996	1012	995	1008	1009	989	977	973	965	959	943	967	942	928	945	982	961	972	985	985	985	983	981	977
23	981	981	981	985	989	991	990	990	989	984	970	967	967	975	975	979	985	990	985	995	989	991	998	999	984	984
24	984	988	989	991	985	994	999	994	980	985	979	970	974	981	985	985	972	995	987	990	1000	996	997	999	998	988
25	998	995	995	997	999	1006	1001	1002	1003	1001	994	987	982	985	983	984	991	995	995	995	992	992	990	994	995	994
26	994	1004	993	993	987	1005	1003	990	985	991	983	978	974	977	983	984	988	988	985	989	990	993	994	993	994	989
27	994	994	992	994	995	997	1004	1002	996	991	988	988	988	989	991	991	994	997	999	1002	1003	1003	1000	999	998	996
28	998	998	1000	998	1000	1003	1004	1003	998	994	988	979	981	988	989	994	996	996	992	986	987	990	993	994	998	994
29	998	998	997	1000	1003	1007	1007	1004	1001	996	989	985	985	984	988	991	996	993	993	998	994	1002	1003	1004	1001	997
30	1001	999	1001	1003	1003	1014	1013	1011	1011	1007	995	989	984	982	975	969	973	964	963	983	993	984	984	988	991	991
Mean†	993	992	994	995	996	999	1000	997	993	988	980	976	975	979	983	984	988	992	989	991	994	996	993	993	993	990

†Mean for 29 days only, 5th omitted. *Burner sooted up.

XLII.—TERRESTRIAL MAGNETIC FORCE: WEST COMPONENT.

Eskdalemuir. (**—Y.**) *Mean Values for Periods of* 60 *Minutes centred at the Hours of Greenwich Mean Time.* **November, 1919.**

4,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	847	846	850	852	857	863	862	859	857	851	857	862	867	873	872	872	867	866	866	864	859	867	866	864	863	861
2	863	864	864	865	865	863	858	856	852	849	855	871	877	877	873	871	869	871	871	869	870	859	851	869	849	864
3	849	861	858	859	859	859	859	856	854	853	861	873	882	887	884	879	876	873	874	873	872	869	867	867	866	867
4	866	866	864	866	864	876	868	860	862	856	869	882	893	913	954	946	972	941	871	845	851	846	845	844	850	880
5	850	845	846	840	849	847	851	850	846	845	848	867	871	870	867	863	862	862	862	859	858	856	856	855	856	855
6	856	856	855	856	856	857	855	852	850	846	847	856	865	866	862	859	860	859	858	859	859	859	860	860	859	857
7	859	858	858	859	859	857	855	852	851	848	855	864	869	870	871	870	869	869	867	866	864	861	863	861	861	862
8	861	861	861	858	861	862	862	860	859	856	862	872	879	885	883	878	879	878	876	873	869	863	862	861	859	868
9	859	854	856	860	861	862	861	859	856	854	856	869	877	877	873	868	867	866	867	866	866	865	862	861	860	863
10	859	861	860	858	853	858	859	855	854	852	860	869	876	879	880	877	872	875	872	872	868	867	862	855	859	865
11	859	860	864	867	870	869	871	877	865	859	859	865	879	881	888	892	910	886	866	848	837	835	813	844	847	865
12	847	861	808	815	831	852	886	869	860	860	864	870	872	876	876	864	859	876	871	861	854	852	855	853	853	858
13	853	856	858	860	862	863	862	856	862	861	868	872	876	877	875	870	866	863	862	863	862	861	860	860	859	864
14	859	860	860	861	863	863	863	863	860	859	862	867	873	876	874	871	870	870	867	866	863	864	865	862	860	865
15	860	862	860	859	856	860	861	862	863	860	864	874	879	883	879	874	872	871	869	867	851	854	862	864	862	865
16	862	863	862	865	866	867	867	868	865	869	876	878	885	882	882	891	908	915	915	889	860	853	840	797	819	871
17	810	834	853	864	867	854	856	851	845	849	854	862	869	874	884	875	872	876	863	860	801	786	832	847	855	853
18	855	850	855	855	853	855	852	852	853	851	857	864	870	872	883	876	860	862	786	836	846	855	857	855	864	855
19	864	859	860	860	858	858	857	855	852	851	859	867	871	871	869	868	865	862	860	860	860	860	859	860	860	861
20	860	860	861	861	862	862	861	861	859	854	852	862	870	874	874	871	870	868	866	861	860	860	860	860	860	863
21	860	863	865	862	865	866	862	861	858	855	857	866	876	882	880	877	874	874	874	870	848	791	834	860	863	862
22	863	865	865	868	858	855	857	867	880	885	890	879	881	886	899	893	874	838	859	861	857	855	854	854	854	868
23	855	855	860	862	861	861	859	859	857	855	853	861	869	879	872	871	866	869	871	834	859	856	854	844	848	860
24	848	850	856	855	858	855	857	858	864	867	873	877	879	879	878	880	860	865	871	868	857	861	857	852	851	864
25	851	859	863	866	866	867	869	863	862	862	859	863	871	880	871	871	867	866	864	864	861	852	847	851	846	863
26	846	855	849	845	862	867	860	861	861	863	868	870	871	877	873	871	867	866	863	862	859	859	857	858	861	862
27	861	861	861	863	863	862	862	864	868	862	864	867	877	875	871	867	867	866	865	864	862	861	860	860	861	865
28	861	862	863	862	862	865	861	860	856	855	861	867	877	878	877	875	871	873	873	870	864	853	850	857	861	865
29	861	863	866	866	867	867	866	866	868	861	863	866	871	878	875	875	876	876	861	866	864	861	863	866	865	867
30	865	865	866	867	871	877	871	865	865	862	864	874	879	883	886	905	891	882	872	856	854	845	845	839	844	868
Mean†	859	858	858	859	861	862	862	860	859	857	862	869	875	879	880	878	876	873	866	863	857	853	854	855	856	864

†Mean for 29 days only, 5th omitted.

XLIII.—TERRESTRIAL MAGNETIC FORCE: VERTICAL COMPONENT.

Eskdalemuir. (Z.) *Mean Values of Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **November, 1919.**

44,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1070	1066	1062	1060	1063	1062	1061	1062	1063	1065	1064	1063	1063	1063	1067	1069	1071	1071	1069	1068	1069	1066	1067	1067	1067	1065
2	1067	1066	1065	1065	1064	1064	1063	1065	1067	1067	1065	1064	1067	1067	1067	1069	1070	1069	1068	1069	1069	1071	1072	1061	1059	1067
3	1060	1061	1064	1064	1064	1064	1064	1064	1068	1070	1067	1066	1067	1065	1064	1063	1062	1063	1063	1063	1062	1065	1064	1063	1062	1064
4	1062	1062	1061	1060	1060	1060	1056	1059	1062	1065	1059	1054	1052	1054	1066	1108	1154	1285	1216	1147	1117	1102	1090	1084	1064	1092
5	1065	1057	1069	1073	1073	1074	1073	1073	1075	1075	1077	1075	1077	1076	1077	1076	1074	1073	1072	1072	1072	1072	1072	1072	1072	1073
6	1073	1073	1072	1070	1070	1069	1068	1068	1070	1073	1071	1069	1069	1070	1070	1070	1069	1068	1068	1068	1068	1067	1067	1068	1068	1069
7	1069	1068	1068	1067	1067	1067	1066	1065	1066	1069	1068	1067	1067	1069	1071	1069	1067	1065	1063	1063	1064	1065	1066	1067	1067	1067
8	1068	1068	1067	1067	1064	1062	1062	1060	1059	1062	1060	1058	1058	1062	1062	1062	1061	1060	1060	1060	1060	1062	1064	1064	1065	1062
9	1065	1067	1067	1065	1065	1063	1062	1062	1063	1065	1063	1064	1065	1065	1066	1067	1066	1064	1062	1062	1062	1061	1060	1062	1063	1064
10	1064	1063	1063	1063	1063	1061	1061	1062	1062	1063	1061	1060	1061	1062	1063	1064	1065	1064	1063	1062	1063	1063	1064	1064	1064	1063
11	1065	1064	1063	1061	1059	1059	1058	1054	1055	1057	1058	1059	1060	1062	1066	1067	1071	1098	1114	1116	1108	1087	1076	1062	1056	1071
12	1057	1043	1018	1021	1016	1019	1022	1036	1052	1057	1057	1059	1065	1070	1075	1083	1090	1083	1079	1078	1078	1074	1071	1069	1067	1057
13	1068	1068	1067	1066	1064	1064	1064	1063	1063	1063	1060	1062	1067	1067	1070	1072	1074	1072	1070	1068	1066	1066	1064	1064	1065	1066
14	1066	1065	1065	1063	1063	1063	1063	1063	1063	1065	1063	1062	1063	1064	1067	1066	1065	1064	1064	1065	1067	1066	1065	1063	1063	1064
15	1063	1062	1059	1059	1059	1059	1059	1060	1059	1061	1059	1059	1061	1065	1065	1065	1065	1066	1065	1065	1068	1062	1061	1061	1061	1062
16	1062	1061	1059	1058	1057	1053	1052	1052	1053	1053	1053	1051	1055	1057	1060	1060	1064	1086	1101	1110	1105	1102	1107	1085	1078	1069
17	1079	1061	1059	1063	1061	1067	1067	1071	1075	1075	1069	1070	1071	1071	1075	1082	1080	1075	1076	1076	1082	1073	1065	1065	1059	1071
18	1061	1065	1066	1065	1065	1066	1065	1067	1067	1068	1065	1065	1065	1067	1072	1075	1083	1082	1093	1081	1079	1070	1068	1069	1065	1070
19	1066	1066	1066	1066	1065	1066	1066	1066	1066	1066	1063	1066	1066	1066	1068	1070	1069	1068	1067	1066	1066	1065	1066	1066	1064	1066
20	1065	1065	1064	1063	1063	1062	1062	1062	1063	1063	1060	1059	1060	1063	1063	1064	1063	1063	1063	1063	1064	1063	1063	1062	1063	1063
21	1064	1062	1061	1060	1060	1060	1060	1060	1061	1064	1061	1057	1060	1063	1064	1064	1064	1063	1063	1064	1069	1082	1076	1066	1065	1064
22	1066	1065	1064	1054	1053	1051	1053	1054	1056	1058	1060	1062	1069	1081	1093	1119	1129	1125	1116	1105	1089	1082	1076	1073	1073	1077
23	1075	1075	1075	1073	1072	1071	1071	1070	1070	1071	1071	1071	1069	1071	1075	1078	1076	1075	1075	1082	1076	1073	1073	1065	1067	1073
24	1067	1067	1064	1061	1064	1067	1067	1066	1067	1064	1061	1060	1064	1067	1071	1076	1083	1080	1079	1079	1075	1073	1071	1069	1068	1069
25	1068	1066	1066	1065	1065	1063	1061	1060	1059	1060	1063	1060	1057	1060	1065	1066	1068	1068	1067	1067	1068	1070	1069	1067	1067	1064
26	1068	1054	1058	1061	1060	1046	1051	1056	1059	1062	1062	1064	1065	1065	1067	1068	1071	1072	1072	1071	1071	1069	1068	1068	1065	1064
27	1066	1066	1066	1066	1066	1065	1064	1063	1062	1061	1061	1061	1061	1061	1062	1066	1066	1066	1065	1064	1063	1062	1061	1061	1060	1064
28	1061	1062	1061	1061	1061	1060	1060	1061	1061	1059	1056	1055	1055	1059	1063	1065	1065	1066	1067	1069	1070	1070	1069	1065	1059	1063
29	1059	1060	1060	1061	1061	1061	1060	1060	1060	1062	1060	1060	1060	1061	1063	1066	1064	1065	1068	1066	1068	1067	1063	1062	1061	1062
30	1062	1061	1061	1061	1061	1057	1057	1059	1058	1057	1054	1055	1058	1061	1065	1065	1073	1086	1094	1093	1086	1085	1081	1077	1071	1068
Mean†	1066	1064	1062	1062	1061	1060	1060	1061	1062	1064	1062	1061	1063	1065	1068	1072	1075	1080	1079	1076	1074	1072	1070	1067	1065	1067

†Mean for 29 days only, 5th omitted.

XLIV.—AUXILIARY OBSERVATIONS IN ABSOLUTE MEASURE; DAILY VALUES OF TEMPERATURE IN THE EAST ROOM OF MAGNET HOUSE; MAGNETIC NOTES FOR THE MONTH.

Eskdalemuir. **November, 1919.**

Date	Time G.M.T. From	Time G.M.T. To	Horizontal Force.	Declination.	Dip.	Temperature in Magnet House.	Magnetic Character of day (0–2)	Date.
Nov.	h. m.	h. m.	γ	° ′ ″	° ′	a 280+		
						6·4	0	1
						6·4	0	2
						6·4	0	3
4	10 43	11 7	16694	16 58 10	69 39·7	6·3	ID	4
						6·3	0	5
						6·3	0	6
						6·2	OC	7
						6·2	0	8
						6·2	OC	9
						6·1	0	10
						6·0	ID	11
12	10 53	11 20	16684	16 57 36	69 40·8	6·0	I	12
						5·9	0	13
						6·0	OC	14
						5·9	0	15
						5·8	ID	16
						5·8	ID	17
18	10 47	11 16	16700	16 56 45	69 40·4	5·8	I	18
						5·7	OC	19
						5·7	OC	20
						5·6	I	21
						5·7	ID	22
						5·7	I	23
						5·7	I	24
25	10 43	11 11	16709	16 55 25	69 38·8	5·6	I	25
						5·6	0	26
						5·6	0	27
						5·3	0	28
						5·3	0	29
						5·3	0	30

MAGNETIC NOTES.

November, 1919.

The month was one of the two quietest in the year, and included the two (14th and 27th) quietest days in the year. There were only two slightly disturbed intervals, the first of which began with a sudden commencement at 4d. 9h. 20m., but only lasted 10 hours. The V. trace showed a considerable rise, beginning at 4d. 11h., but the subsequent fall went very little below the undisturbed value. Another moderate disturbance began soon after noon on 16th and continued till 21h. on 18th.

XLV.—TERRESTRIAL MAGNETIC FORCE: NORTH COMPONENT.

Eskdalemuir. (X.) *Mean Values of Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **December, 1919.**

15,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	990	992	997	998	1002	1002	1002	1003	997	993	992	989	988	991	*991*	992	992	994	995	992	991	992	999	996	994	995
2	994	994	994	994	995	997	997	998	997	996	992	992	992	995	993	995	997	1000	997	996	991	987	988	995	995	994
3	995	993	992	997	1001	1009	1015	1014	1012	1010	999	993	983	998	1005	1007	1013	1011	1009	1000	987	977	968	984	991	999
4	990	993	983	984	990	987	1000	998	996	993	986	980	980	982	986	988	991	996	992	991	988	991	991	994	995	990
5	995	990	994	984	985	994	996	996	993	987	972	972	967	971	977	986	986	997	995	998	997	998	992	1011	994	989
6	994	995	992	991	997	1007	1006	996	994	989	986	986	982	988	993	992	996	997	996	991	991	993	992	996	990	993
7	989	992	999	997	1000	1001	1001	999	995	997	990	990	986	989	993	995	996	995	990	997	995	997	997	996	1004	995
8	1004	998	997	997	999	1001	1003	1005	1003	1002	999	994	995	1000	1005	1005	1005	1006	995	993	989	992	980	984	985	998
9	985	985	993	990	993	996	1001	1002	998	990	985	985	985	986	990	995	993	996	991	1000	994	995	1005	996	995	993
10	994	996	995	995	998	1000	1003	1006	1008	1009	1004	997	994	994	989	960	996	1004	1004	1000	998	995	996	993	1003	997
11	1003	997	995	994	994	1000	1004	1002	1004	1002	999	993	987	979	973	979	969	982	984	989	995	991	991	994	999	992
12	998	998	998	996	998	1002	1005	1007	999	988	983	983	975	965	970	967	976	993	997	998	998	998	995	1018	1006	992
13	1006	987	992	990	994	1012	1019	1014	1005	1013	1003	988	980	983	988	993	984	992	987	986	994	990	996	989	991	995
14	991	988	988	991	993	998	988	962	959	959	953	951	955	970	975	963	965	965	1006	988	984	990	988	987	983	977
15	983	981	984	983	984	989	984	975	954	818	807	880	909	906	930	922	943	944	946	957	958	962	976	959	958	943
16	957	957	959	958	961	964	967	970	967	961	954	956	957	961	968	976	978	980	978	982	977	976	979	977	977	968
17	977	976	977	977	979	985	987	987	987	982	973	974	977	977	980	987	992	990	992	987	988	987	988	987	984	983
18	984	985	983	984	988	994	997	997	997	992	983	980	979	982	987	992	997	997	994	988	979	976	977	1012	972	988
19	972	966	973	992	986	987	989	991	996	996	986	978	977	973	977	977	981	988	992	992	993	993	994	993	1008	986
20	1007	1006	982	981	982	987	995	997	992	991	988	987	986	984	985	990	984	974	963	984	986	982	983	986	1000	987
21	1000	1000	986	974	997	997	997	994	984	961	953	969	972	978	980	981	981	981	976	997	973	985	987	990	986	983
22	985	983	985	984	986	993	995	998	996	991	965	956	965	976	980	971	971	960	971	974	965	979	981	991	982	979
23	982	974	979	980	980	985	990	990	980	959	972	970	972	975	975	971	966	971	979	980	988	1000	993	986	982	979
24	982	990	986	984	990	1000	987	975	985	982	974	972	964	979	979	957	955	975	972	985	981	1004	1006	966	980	980
25	979	987	974	975	984	993	989	979	985	985	978	973	973	976	978	974	985	984	986	984	994	989	982	984	989	982
26	989	985	984	984	985	990	991	991	989	984	978	980	980	979	983	986	989	989	990	990	990	991	992	991	990	987
27	990	995	991	989	994	998	999	1004	998	989	983	983	979	974	973	977	973	984	992	991	989	994	989	989	988	988
28	987	986	985	990	996	994	991	993	998	996	988	976	966	964	964	967	973	979	983	981	977	988	991	990	989	984
29	989	990	990	991	993	995	994	997	995	993	987	980	979	985	984	987	988	989	993	993	989	990	993	993	997	990
30	997	998	988	984	989	998	999	996	998	995	987	982	973	975	978	984	989	990	992	994	993	990	994	994	998	990
31	998	993	994	998	997	998	998	994	993	991	987	982	982	983	987	988	993	995	997	998	998	997	997	999	998	993
Mean	990	989	987	987	991	995	996	995	992	984	977	976	975	978	981	981	984	987	988	990	987	989	990	991	990	987

XLVI.—TERRESTRIAL MAGNETIC FORCE: WEST COMPONENT.

Eskdalemuir. (—Y.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **December, 1919.**

4,000 γ +

Hour G.M.T.	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	844	851	852	856	857	857	860	861	861	861	866	875	881	883	*885*	887	883	880	877	871	861	857	856	851	860	866
2	860	862	866	866	863	863	864	862	861	861	863	867	871	874	872	871	874	876	861	868	862	855	841	855	857	864
3	857	860	876	861	860	861	861	864	864	867	868	872	875	880	879	877	878	877	877	877	880	876	829	840	840	867
4	840	825	843	854	842	852	853	853	850	856	855	861	870	877	881	882	887	893	878	876	864	860	851	856	854	861
5	854	840	828	846	864	861	861	861	855	856	855	870	866	886	879	883	874	867	869	866	862	862	854	829	855	860
6	855	857	857	859	863	861	859	861	862	862	860	859	876	875	874	871	870	870	871	871	861	861	856	851	847	863
7	847	859	858	857	867	866	866	862	864	866	861	862	866	871	873	871	867	866	860	863	861	861	858	857	861	863
8	861	861	858	857	859	860	861	862	861	861	868	871	872	877	878	873	871	877	871	872	872	840	862	834	843	864
9	843	845	854	861	860	862	866	866	862	857	856	862	871	872	874	874	874	880	871	849	848	855	859	850	855	862
10	855	861	865	866	866	866	866	865	863	863	866	869	874	877	882	868	872	874	874	871	866	855	850	851	847	866
11	847	850	861	866	867	866	867	867	866	864	861	866	869	870	878	877	870	868	866	861	857	855	850	850	841	863
12	841	852	860	863	866	870	866	866	865	861	869	874	877	892	894	893	880	870	867	866	861	854	855	843	824	867
13	824	843	850	855	866	866	877	873	872	871	867	881	874	874	888	884	883	867	872	872	864	855	842	853	863	866
14	863	861	861	861	862	863	869	934	913	888	876	879	866	876	882	886	903	887	872	861	857	844	848	852	851	873
15	851	859	837	848	851	850	845	856	888	845	889	874	868	883	883	901	912	876	824	841	827	809	818	834	850	857
16	850	850	845	841	845	845	850	855	854	855	851	866	866	865	861	856	855	857	855	855	854	850	845	850	854	853
17	854	855	856	857	857	855	855	855	853	850	856	860	862	869	869	867	866	863	864	861	859	856	855	855	855	859
18	856	857	860	862	863	863	862	862	861	856	856	862	867	874	877	872	867	867	867	865	856	840	835	820	794	858
19	794	839	862	866	853	856	854	857	860	856	862	862	875	877	878	872	862	866	865	862	861	861	862	860	861	861
20	861	822	851	855	856	862	867	868	867	861	862	869	872	877	879	877	877	876	852	850	858	852	845	847	867	861
21	867	855	841	856	851	862	871	877	871	855	856	867	862	864	872	868	852	848	836	817	845	839	847	851	852	855
22	852	857	871	971	868	862	862	865	861	857	863	877	879	883	881	856	825	876	834	825	836	839	830	815	830	856
23	830	845	853	860	867	867	867	863	862	850	861	867	868	873	877	873	867	851	858	856	846	835	841	815	829	856
24	829	845	841	854	861	871	878	889	893	877	873	872	867	875	880	879	872	876	846	850	856	815	793	815	827	859
25	827	841	858	866	861	867	867	862	857	856	853	856	862	870	868	863	865	862	860	856	839	852	851	846	851	857
26	851	862	859	858	861	863	861	860	856	851	856	866	868	868	872	868	864	864	863	862	862	861	860	860	860	862
27	860	861	856	862	862	862	865	865	862	862	870	870	872	872	874	873	867	868	866	862	855	850	851	856	857	863
28	857	861	862	868	861	864	864	867	862	861	856	857	861	871	880	884	875	869	867	863	858	856	856	852	856	864
29	856	861	860	861	861	862	866	867	861	857	862	867	867	872	871	869	867	867	865	864	861	856	857	857	863	863
30	863	862	856	867	861	866	864	863	868	866	867	871	867	872	867	868	866	865	862	862	860	855	856	852	861	864
31	861	861	863	858	860	856	858	857	856	858	865	865	867	872	873	872	868	867	867	864	864	862	862	862	862	863
Mean	849	852	855	859	860	862	863	866	865	860	863	868	870	875	877	875	871	870	862	860	857	851	848	846	849	862

Workmen repairing gas pipe between 13h·30m and 14h·10m on the 1st.

XLVII.—TERRESTRIAL MAGNETIC FORCE: VERTICAL COMPONENT.

Eskdalemuir. (Z.) *Mean Values for Periods of 60 Minutes centred at the Hours of Greenwich Mean Time.* **December, 1919.**

44,000 γ +

Hour G.M.T	0	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Mean
Day	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	1072	1067	1063	1063	1063	1064	1063	1062	1062	1062	1062	1062	1061	1062	*1063*	1065	1066	1068	1070	1072	1073	1074	1068	1067	1065	1065
2	1066	1064	1064	1064	1064	1064	1064	1064	1064	1064	1062	1061	1061	1063	1067	1066	1066	1066	1068	1068	1072	1077	1078	1075	1069	1066
3	1070	1068	1061	1063	1064	1063	1061	1062	1060	1059	1060	1060	1060	1059	1060	1060	1060	1061	1061	1066	1072	1091	1104	1098	1087	1067
4	1087	1072	1070	1069	1068	1068	1064	1060	1061	1062	1064	1063	1064	1064	1065	1066	1067	1067	1073	1076	1080	1084	1087	1080	1075	1070
5	1076	1071	1062	1060	1064	1066	1065	1066	1062	1063	1064	1061	1064	1066	1069	1071	1073	1073	1070	1069	1069	1069	1073	1074	1069	1067
6	1070	1068	1067	1066	1061	1058	1058	1058	1061	1061	1061	1063	1064	1065	1066	1069	1069	1066	1066	1067	1070	1070	1071	1070	1072	1065
7	1073	1067	1063	1064	1063	1062	1061	1060	1059	1057	1058	1059	1060	1059	1059	1063	1067	1067	1068	1066	1066	1066	1066	1067	1065	1063
8	1066	1065	1065	1065	1064	1062	1060	1060	1059	1059	1059	1060	1059	1060	1063	1064	1066	1064	1064	1065	1069	1076	1071	1076	1074	1064
9	1075	1073	1070	1068	1068	1067	1065	1064	1064	1064	1964	1062	1064	1065	1065	1069	1070	1070	1072	1076	1072	1071	1068	1066	1067	1068
10	1068	1066	1063	1063	1064	1963	1063	1063	1062	1059	1058	1058	1059	1062	1068	1078	1074	1069	1065	1065	1066	1068	1069	1068	1063	1065
11	1064	1063	1060	1061	1062	1063	1062	1062	1061	1059	1056	1057	1059	1063	1067	1071	1075	1075	1075	1074	1071	1070	1070	1067	1064	1065
12	1065	1062	1062	1063	1064	1062	1063	1062	1061	1064	1064	1065	1068	1069	1072	1076	1077	1076	1073	1072	1071	1071	1071	1067	1064	1067
13	1065	1061	1058	1058	1058	1053	1047	1045	1047	1049	1052	1056	1056	1056	1059	1064	1070	1073	1075	1079	1079	1078	1077	1072	1068	1062
14	1068	1067	1066	1066	1065	1065	1065	1049	1048	1054	1060	1064	1076	1077	1079	1101	1109	1118	1090	1093	1092	1086	1081	1078	1077	1076
15	1078	1073	1070	1066	1066	1066	1066	1058	1042	1062	1090	1096	1129	1100	1109	1143	1131	1147	1157	1138	1153	1093	1074	1065	1061	1094
16	1062	1062	1070	1076	1077	1078	1079	1081	1081	1080	1081	1081	1082	1083	1087	1087	1083	1081	1079	1079	1081	1081	1081	1079	1078	1079
17	1079	1077	1077	1077	1077	1076	1077	1077	1078	1080	1080	1080	1079	1076	1077	1077	1076	1076	1076	1076	1076	1076	1076	1076	1076	1077
18	1076	1075	1075	1073	1072	1072	1072	1072	1073	1073	1072	1072	1071	1069	1069	1072	1072	1072	1072	1073	1080	1088	1091	1071	1064	1074
19	1065	1065	1058	1037	1052	1062	1067	1068	1069	1071	1072	1072	1072	1073	1077	1078	1081	1078	1076	1074	1073	1073	1072	1072	1068	1069
20	1069	1059	1063	1066	1066	1066	1066	1067	1069	1069	1067	1067	1069	1067	1070	1074	1075	1079	1091	1088	1082	1081	1081	1078	1063	1072
21	1063	1053	1054	1047	1034	1047	1053	1057	1061	1066	1069	1073	1075	1078	1079	1082	1082	1086	1086	1085	1080	1077	1073	1070	1070	1068
22	1070	1070	1065	1059	1059	1062	1065	1065	1066	1067	1070	1069	1066	1066	1073	1092	1102	1097	1105	1098	1098	1082	1077	1043	1042	1074
23	1043	1058	1062	1066	1067	1067	1067	1067	1070	1072	1074	1072	1074	1073	1074	1079	1086	1090	1087	1083	1081	1077	1072	1068	1065	1073
24	1066	1061	1053	1040	1028	1032	1036	1036	1040	1048	1057	1063	1070	1072	1075	1084	1092	1090	1096	1091	1084	1081	1068	1060	1060	1063
25	1060	1056	1056	1063	1069	1071	1069	1072	1075	1073	1071	1072	1072	1072	1077	1080	1078	1077	1077	1077	1077	1076	1076	1075	1074	1072
26	1075	1070	1072	1074	1074	1073	1073	1073	1073	1073	1072	1069	1069	1069	1074	1077	1078	1077	1074	1073	1073	1073	1072	1072	1072	1073
27	1073	1070	1070	1071	1071	1071	1071	1070	1071	1070	1069	1069	1070	1071	1074	1075	1077	1075	1075	1077	1077	1077	1077	1074	1073	1073
28	1073	1073	1071	1069	1070	1070	1070	1070	1070	1070	1070	1070	1074	1074	1076	1081	1082	1081	1081	1081	1082	1081	1077	1074	1073	1075
29	1074	1074	1074	1073	1072	1072	1071	1070	1072	1072	1072	1071	1071	1068	1069	1071	1074	1074	1074	1074	1075	1075	1074	1072	1067	1072
30	1068	1064	1064	1067	1068	1069	1070	1071	1072	1072	1072	1073	1073	1072	1076	1076	1076	1076	1075	1075	1075	1076	1073	1071	1068	1072
31	1068	1067	1067	1066	1066	1067	1067	1068	1070	1071	1070	1071	1070	1069	1069	1068	1069	1069	1069	1069	1069	1069	1069	1068	1067	1069
Mean	1069	1066	1065	1064	1064	1065	1065	1064	1064	1065	1067	1067	1070	1069	1072	1077	1078	1079	1079	1078	1079	1077	1075	1071	1068	1070

XLVIII.—AUXILIARY OBSERVATIONS IN ABSOLUTE MEASURE; DAILY VALUES OF TEMPERATURE IN THE EAST ROOM OF MAGNET HOUSE; MAGNETIC NOTES FOR THE MONTH.

Eskdalemuir. **December, 1919.**

Date	Time G.M.T. From	Time G.M.T. To	Horizontal Force.	Declination.	Dip.	Temperature in Magnet House.	Magnetic Character of day (0–2).	Date.
Dec.	h. m.	h. m.	γ	° ′ ″	° ′	a 280+		
						5·3	0C	1
						5·3	0	2
3	10 55	11 23	16720	16 57 18	69 38·3	5·3	1D	3
						5·2	1	4
						5·2	1	5
						5·2	0	6
						5·1	0	7
						5·1	1	8
9	10 45	11 12	16711	16 55 43	69 39·4	5·1	0	9
						5·0	0	10
						5·0	0	11
						4·9	1	12
						4·9	1	13
						4·9	1D	14
						4·9	2D	15
16	11 2	11 28	16681	16 56 4	69 42·3	4·8	1	16
						4·8	0C	17
						4·8	1	18
						4·7	1	19
						4·7	1	20
						4·8	1	21
						4·6	1D	22
23	11 11	11 33	16692	17 2 28	69 40·3	4·6	1	23
						4·7	1D	24
						4·7	1	25
						4·8	0C	26
						4·7	0	27
						4·7	0	28
29	10 50	11 19	16706	17 1 54	69 39·3	4·7	0C	29
						4·7	0	30
						4·6	0C	31

MAGNETIC NOTES.

December, 1919.

This was the quietest month of the year. The 17th was particularly quiet. The only disturbance recorded began shortly before 12d. 23h., in the course of which there occurred a notable fall in the value of N., beginning about 15d. 8h., and amounting to 259γ. A sharp inverted tooth-like movement on N., centering at 16d. 21h. 6m., is also noted. The changes in V. were almost wholly on the positive side of the undisturbed value and were unlike the usual changes in an ordinary storm. Mention may be made of an isolated bay occurring on the traces, beginning about 20h. 0m. It bears a strong resemblance to that mentioned in the *Magnetic Notes* for June, 1919. The vector diagrams drawn to represent it in the three co-ordinate planes are similar in form.

XLIX.-LI.—DIURNAL INEQUALITIES OF THE GEOGRAPHICAL COMPONENTS OF MAGNETIC FORCE.

(Not corrected for the effect of the North Force on the West Magnetograph, or *vice versa*, or for the effect of the Horizontal Force on the V.F. Balance.)

Mean Hourly Values, Greenwich Mean Time, for the Months, Year, and Seasons.

XLIX.—NORTH COMPONENT (*all days except Feb. 17, 18, Mar. 19, 20, 21, 28, April 7, July 11, 12, 26, Aug. 11, Sept. 27, 28, 29, Oct. 1, 2, Nov. 5.*)

Eskdalemuir. **1919.**

Month and Season.	Hour 1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.
	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
J.	3·3	2·5	− 1·6	3·5	6·2	7·1	x 7·6	3·5	− 0·2	− 7·4	−11·9	n̄12·9	−11·6	− 7·4	− 2·3	− 3·3	− 1·4	1·2	4·3	6·5	3·9	4·1	0·9	5·5
F.	2·2	0·5	− 0·9	3·1	7·0	2·4	3·1	1·7	− 5·5	−11·2	−16·9	n̄18·3	−12·6	− 8·8	− 3·6	− 2·2	3·5	7·1	10·3	9·7	5·6	x12·4	6·0	5·1
M.	2·8	3·0	3·5	5·5	8·8	8·4	4·9	0·5	− 8·3	−20·6	−28·4	n̄31·3	−21·4	−13·3	− 3·2	2·0	10·6	7·2	x14·3	12·1	11·3	9·5	12·3	10·3
A.	8·2	7·5	7·6	5·0	7·6	7·2	4·9	1·7	−10·3	−25·4	n̄36·7	−34·2	−27·4	−17·9	−10·6	3·7	11·3	17·6	x19·0	17·4	15·1	10·2	9·9	8·6
M.	5·2	8·6	3·1	5·7	− 3·4	− 2·1	− 7·4	−13·8	−22·6	−31·4	n̄34·4	−34·1	−26·5	−14·7	− 1·4	12·9	25·9	x33·4	30·9	25·9	17·7	10·9	6·9	4·8
J.	3·2	5·8	3·5	8·4	9·4	4·4	− 3·9	−13·1	−22·6	−31·3	n̄34·4	−32·3	−24·9	−13·7	− 4·3	6·7	14·6	21·9	x26·0	23·8	21·5	16·2	9·3	5·9
J.	9·7	6·7	7·8	7·4	10·4	7·2	1·1	− 6·1	−18·7	−32·7	−37·4	n̄38·5	−29·2	−17·7	− 5·1	7·3	15·4	x21·7	20·1	17·3	15·3	16·5	12·3	9·3
A.	8·6	− 1·1	6·6	7·6	11·3	9·5	3·2	− 6·1	−18·0	−32·0	n̄33·1	−29·8	−21·7	−12·2	− 3·2	4·8	10·4	14·2	16·7	x16·9	14·9	13·8	10·3	8·3
S.	3·8	8·5	12·5	12·0	12·2	10·3	1·5	− 6·6	−17·1	−28·2	n̄33·3	−30·3	−20·1	−10·5	− 2·3	5·4	12·9	13·2	x14·7	12·3	14·2	3·9	5·3	5·8
O.	7·1	3·2	5·2	5·4	8·3	6·3	2·2	− 1·3	− 7·0	−18·3	−26·6	n̄27·6	−23·6	−14·9	− 5·4	3·3	10·1	6·7	9·8	12·1	x14·2	11·1	10·4	9·4
N.	2·5	3·9	4·6	5·8	9·1	x 9·8	7·2	3·5	− 1·5	− 9·6	−14·1	n̄15·3	−10·5	− 7·4	− 6·4	− 2·2	1·6	− 0·9	1·4	3·9	5·8	2·8	3·2	3·0
D.	2·3	0·9	0·8	4·1	8·7	x 9·9	7·9	5·5	− 3·0	− 9·7	−10·2	n̄11·3	− 8·7	− 5·6	− 6·0	− 3·0	0·2	1·4	2·7	0·5	2·4	2·8	4·0	3·4
Y.	4·9	4·2	4·4	6·1	8·0	6·7	2·7	− 2·6	−11·2	−21·5	n̄26·5	−26·3	−19·9	−12·0	− 4·5	3·0	9·6	12·1	x14·2	13·2	11·8	9·5	7·6	6·6
W.	2·6	2·0	0·7	4·1	x 7·8	7·3	6·5	3·5	− 2·5	− 9·5	−13·3	n̄14·4	−10·9	− 7·3	− 4·6	− 2·7	1·0	2·2	4·7	5·2	4·4	5·5	3·5	4·3
Eq.	5·5	5·5	7·2	7·0	9·2	8·0	3·4	− 1·4	−10·7	−23·2	n̄31·3	−30·9	−23·1	−14·2	− 5·4	3·6	11·2	11·2	x14·5	13·5	13·7	8·7	9·5	8·5
S.	6·7	5·0	5·3	7·3	6·9	4·8	− 1·8	− 9·8	−20·5	−31·9	n̄34·8	−33·6	−25·6	−14·6	− 3·5	7·9	16·6	22·8	x23·4	21·0	17·3	14·3	9·7	7·1

L.—WEST COMPONENT (*all days except Feb. 17, 18, Mar. 19, 20, 21, 28, April 7, July 11, 12, 26, Aug. 11, Sept. 27, 28, 29, Oct. 1, 2, Nov. 5*).

Eskdalemuir. **1919.**

	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
J.	− 9·3	− 9·7	− 4·9	− 3·5	− 3·6	− 1·0	3·7	1·5	− 1·3	3·7	7·6	13·2	17·9	x18·1	16·7	11·4	3·7	5·8	0·5	−14·9	n̄17·8	−16·9	−12·1	− 8·7
F.	−10·3	n̄12·2	− 7·9	− 7·1	− 7·3	− 5·1	0·3	1·6	2·1	5·9	12·1	16·2	x21·5	20·4	14·3	8·5	− 3·1	− 3·6	− 5·8	− 7·6	− 4·6	− 8·8	−11·1	− 8·5
M.	n̄12·4	−10·2	− 9·6	−10·0	− 7·8	− 5·4	− 4·9	−11·9	−14·4	− 7·7	1·7	15·3	28·9	x30·9	25·2	15·2	9·1	5·3	− 3·5	− 7·5	− 3·9	− 8·2	− 9·4	− 4·7
A.	− 7·0	− 8·3	−12·2	−11·9	−11·0	−12·2	−15·6	−19·1	n̄20·2	−12·0	− 1·7	15·6	27·6	x33·5	30·6	24·2	17·8	12·9	4·8	− 0·3	− 7·5	− 7·5	− 9·7	−10·8
M.	−11·5	−14·6	−15·3	−21·1	−15·4	−18·3	−23·4	n̄25·3	−24·1	−13·5	− 0·9	14·5	26·8	x32·3	30·6	28·8	25·0	19·9	15·5	7·5	− 0·6	− 4·7	− 5·1	− 7·1
J.	− 9·0	−12·7	−13·1	−15·0	−23·6	−32·0	n̄35·2	−35·1	−30·6	−17·6	− 2·7	15·5	28·8	34·6	x34·9	32·7	26·5	20·3	15·8	12·0	9·2	4·7	− 1·9	− 6·4
J.	− 8·9	− 8·2	−11·2	−13·1	−20·0	−25·5	−29·1	n̄33·4	−31·8	−22·1	− 8·0	9·6	24·3	33·5	x35·8	32·5	26·1	20·3	14·2	11·2	7·5	2·7	− 1·9	− 4·4
A.	−11·0	−13·1	−11·0	−15·4	−21·4	−24·5	−26·9	n̄27·6	−22·8	−12·3	3·6	20·4	32·5	x36·5	32·0	24·2	15·3	11·4	9·8	6·2	4·1	0·0	− 3·4	− 6·6
S.	−19·4	−17·6	n̄19·6	−11·9	− 7·2	− 9·5	−11·5	−13·1	−15·1	− 6·3	7·6	22·9	32·7	x36·6	34·1	24·4	18·3	12·2	0·2	− 0·6	− 6·0	−13·7	n̄19·6	−18·1
O.	− 9·0	− 8·0	− 9·6	− 8·3	− 7·2	− 4·9	− 4·4	−13·5	n̄15·7	− 8·6	1·7	13·5	23·7	x25·3	23·7	18·9	13·5	11·0	3·8	− 1·9	− 8·6	−12·3	−13·7	− 9·5
N.	− 5·7	− 6·0	− 4·7	− 3·4	− 1·8	− 1·9	− 3·6	− 4·6	− 6·4	− 2·1	4·8	11·4	15·2	x16·2	14·1	12·0	9·4	2·5	− 1·2	− 6·6	n̄10·9	− 9·8	− 9·0	− 7·8
D.	− 9·3	− 6·1	− 2·3	− 1·6	− 0·1	− 1·3	4·3	3·2	− 1·5	1·1	5·8	7·8	13·0	x15·0	12·8	9·5	8·1	0·5	− 2·0	− 4·8	−11·1	−14·5	n̄16·3	−12·8
Y.	−10·2	−10·6	−10·1	−10·2	−10·5	−11·6	−12·2	−14·8	n̄15·2	− 7·6	2·6	14·6	24·4	x27·7	25·4	20·2	14·1	9·9	4·3	− 0·6	− 4·2	− 7·4	− 9·4	− 8·8
W.	− 8·6	− 8·5	− 5·0	− 3·9	− 3·2	− 1·7	1·2	0·4	− 1·8	2·1	7·6	12·2	16·9	x17·4	14·5	10·3	4·5	1·3	− 2·1	− 8·5	−11·1	n̄12·5	−12·1	− 9·5
Eq.	−12·0	−11·0	−12·7	−10·5	− 8·3	− 8·0	− 9·1	−14·4	n̄16·4	− 8·7	2·3	16·8	28·2	x31·6	28·4	20·7	14·7	10·4	1·3	− 2·6	− 6·5	−10·4	−13·1	−10·8
S.	−10·1	−12·1	−12·7	−16·1	−20·1	−25·1	−28·7	n̄30·4	−27·3	−16·4	− 2·0	15·0	28·1	x34·2	33·3	29·6	23·2	17·9	13·8	9·2	5·0	0·7	− 3·1	− 6·1

LI.—VERTICAL COMPONENT (*all days except Feb. 17, 18, Mar. 19, 20, 21, 28, April 7, July 11, 12, 26, Aug. 11, Sept. 27, 28, 29, Oct. 1, 2, Nov. 5*).

Eskdalemuir. **1919.**

	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
J.	− 7·7	− 7·9	n̄11·0	−10·3	− 8·8	− 8·2	− 8·2	− 7·1	− 5·7	− 4·6	− 3·5	− 2·2	− 0·6	3·2	5·8	10·5	15·1	15·2	x15·4	13·7	11·6	4·9	− 2·2	− 7·5
F.	− 8·5	− 9·7	−10·9	n̄11·2	−10·1	− 8·3	− 7·4	− 5·8	− 4·9	− 4·3	− 4·0	− 3·1	0·5	5·5	8·1	10·1	x14·9	13·4	14·2	10·2	9·0	7·8	− 0·2	− 5·0
M.	−18·2	n̄19·3	−18·5	−14·4	−12·0	− 8·2	− 5·5	− 1·7	− 1·8	− 4·0	− 5·5	− 5·3	− 2·2	4·9	14·2	19·3	21·8	x22·3	20·3	16·6	9·0	1·9	− 2·2	−11·8
A.	− 9·8	− 9·9	− 8·6	n̄11·2	−10·6	− 7·7	− 4·9	− 4·7	− 5·7	− 7·1	− 9·1	− 9·8	− 7·0	− 0·6	6·4	13·7	20·4	x21·3	x21·3	17·0	10·3	4·4	− 1·5	− 6·6
M.	− 8·5	−12·0	−15·8	−17·4	n̄17·4	−16·1	−10·7	− 7·3	−11·2	−10·5	−12·0	−11·2	− 5·4	3·9	13·6	23·0	29·1	x30·7	26·7	21·8	10·6	3·6	− 0·9	− 6·5
J.	− 3·5	− 4·0	− 4·8	− 2·6	0·1	0·3	− 0·1	− 1·6	− 4·8	− 8·9	−13·6	n̄16·4	−12·8	− 5·7	1·2	7·7	11·7	13·3	x14·0	12·6	10·1	6·4	1·8	− 0·5
J.	− 3·6	− 5·0	− 6·6	− 4·8	− 3·9	− 2·0	− 1·3	− 1·7	− 3·5	− 6·7	−10·1	n̄12·7	−11·1	− 6·9	− 1·5	5·1	12·5	15·2	x15·4	13·5	10·0	6·0	3·5	0·3
A.	− 4·8	− 8·3	− 7·8	− 7·0	− 3·5	− 0·5	0·4	− 0·2	− 1·8	− 4·4	− 8·1	n̄10·9	− 9·1	− 2·1	4·0	10·8	14·0	x14·1	11·1	9·0	6·3	3·7	− 0·3	− 4·7
S.	−19·7	n̄20·0	−18·0	−13·7	−12·3	− 8·5	− 5·3	− 4·2	− 4·4	− 5·0	− 6·4	− 7·1	− 2·7	4·5	13·6	22·9	27·1	x28·4	28·3	19·6	11·1	− 1·4	− 7·5	−19·2
O.	− 5·8	−10·1	−15·5	n̄17·0	−16·1	−14·3	−13·1	− 8·2	− 4·5	− 4·2	− 3·9	− 2·3	1·1	4·6	8·2	13·8	x21·1	20·1	19·0	14·9	10·7	5·3	− 0·5	− 3·4
N.	− 3·5	− 4·9	− 5·6	− 6·0	− 6·8	n̄ 7·0	− 6·0	− 4·7	− 3·4	− 5·1	− 5·5	− 4·1	− 2·1	1·0	4·9	8·0	x13·7	12·3	9·6	7·7	5·3	3·4	0·4	− 1·7
D.	− 4·2	− 5·7	− 6·7	n̄ 6·7	− 6·0	− 6·0	− 6·7	− 6·5	− 5·2	− 3·7	− 3·0	− 0·6	− 1·2	1·6	6·5	8·0	8·5	8·6	8·0	x 8·6	7·0	5·4	1·5	− 1·5
Y.	− 8·2	− 9·7	n̄10·8	−10·2	− 8·9	− 7·2	− 5·7	− 4·5	− 4·7	− 5·7	− 7·1	− 7·2	− 4·4	1·2	7·1	12·7	17·5	x17·9	16·9	13·8	9·2	4·3	− 0·7	− 5·7
W.	− 6·0	− 7·1	n̄ 8·6	n̄ 8·6	− 7·9	− 7·4	− 7·1	− 6·0	− 4·8	− 4·4	− 4·0	− 2·5	− 0·9	2·8	6·3	9·2	x13·1	12·4	11·8	10·0	8·2	5·4	− 0·1	− 3·9
Eq.	−13·4	−14·8	n̄15·1	−14·1	−12·7	− 9·7	− 7·2	− 4·7	− 4·1	− 5·1	− 6·3	− 6·1	− 2·7	3·4	10·6	17·4	22·6	x23·1	22·2	17·0	10·3	2·5	− 2·9	−10·2
S.	− 5·1	− 7·3	− 8·8	− 8·0	− 6·2	− 4·6	− 2·9	− 2·7	− 6·3	− 7·6	−11·0	n̄12·8	− 9·6	− 2·7	4·3	11·6	16·8	x18·3	16·8	14·2	9·2	4·9	1·0	− 2·8

x and n̄ mark respectively the mean maximum and minimum hourly values in each month or season.

LII.-LIV.—DIURNAL INEQUALITIES OF THE MAGNETIC COMPONENTS, DECLINATION, INCLINATION, AND HORIZONTAL FORCE.

Mean Hourly Values, Greenwich Mean Time, for the Months, Year, and Seasons.

LII.—DECLINATION (measured positive towards the West) (*all days except Feb. 17, 18, Mar. 19, 20, 21, 28, April 7, July 11, 12, 26, Aug. 11, Sept. 27, 28, 29, Oct. 1, 2, Nov. 5*).

Eskdalemuir. **1919.**

Month and Season.	Hour 1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.
	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′
J.	−2·03	−2·07	−0·87	−0·89	−1·09	−0·63	0·27	0·09	−0·25	1·17	2·22	3·39	*x*4·22	4·00	3·43	2·45	0·80	1·06	−0·15	−3·32	*n*3·75	−3·57	−2·44	−2·04
F.	−2·16	−2·44	−1·49	−1·59	−1·86	−1·15	−0·12	0·20	0·75	1·84	3·41	4·29	*x*4·99	4·55	3·03	1·80	−0·82	−1·15	−1·76	−2·07	−1·23	−2·48	*n*2·55	−1·99
M.	−2·61	−2·19	−2·09	−2·31	−2·06	−1·58	−1·25	−2·38	−2·34	−0·28	2·05	4·89	*x*6·98	6·89	5·16	2·87	1·15	0·61	−1·55	−2·21	−1·44	−2·18	*n*2·60	−1·55
A.	−1·88	−2·08	−2·86	−2·65	−2·62	−2·84	−3·36	*n*3·87	−3·36	−0·83	1·87	5·12	7·08	*x*7·68	6·67	4·55	2·83	1·47	−0·20	−1·11	−2·39	−2·09	−2·51	−2·65
M.	−2·58	−3·40	−3·19	*n*4·50	−2·84	−3·48	−4·16	−4·15	−3·39	−0·76	1·90	4·91	6·88	*x*7·24	6·12	4·90	3·36	1·91	1·19	−0·08	−1·17	−1·58	−1·42	−1·68
J.	−1·97	−2·83	−2·79	−3·45	−5·19	−6·53	*n*6·67	−6·09	−4·65	−1·57	1·53	4·97	7·14	*x*7·61	7·10	6·00	4·31	2·65	1·54	0·93	0·51	−0·04	−0·93	−1·61
J.	−2·32	−2·01	−2·67	−3·00	−4·55	−5·42	−5·77	*n*6·19	−5·11	−2·38	0·67	4·18	6·52	*x*7·64	7·31	5·94	4·20	2·68	1·57	1·15	0·55	−0·47	−1·11	−1·43
A.	−2·68	−2·50	−2·55	−3·48	−4·89	−5·40	*n*5·49	−5·08	−3·41	−0·50	2·68	5·80	7·70	*x*7·93	6·50	4·49	2·39	1·39	0·93	0·20	−0·10	−0·83	−1·28	−1·80
S.	−4·04	−3·97	*n*4·60	−3·05	−2·16	−2·49	−2·34	−2·19	−1·94	0·45	3·50	6·31	7·65	*x*7·83	6·85	4·49	2·82	1·62	−0·85	−0·86	−2·02	−2·93	−4·17	−3·91
O.	−2·21	−1·76	−2·19	−1·95	−1·92	−1·35	−1·00	−2·59	−2·67	−0·60	1·92	4·31	*x*6·08	5·87	5·00	3·53	2·05	1·78	0·16	−1·10	−2·54	−3·09	*n*3·32	−2·44
N.	−1·26	−1·41	−1·21	−1·01	−0·89	−0·95	−1·14	−1·12	−1·18	0·16	1·79	3·16	3·62	*x*3·63	3·15	2·49	1·76	0·55	−0·32	−1·53	*n*2·50	−2·10	−1·97	−1·72
D.	−1·97	−1·26	−0·50	−0·56	−0·55	−0·34	0·37	0·30	−0·12	0·80	1·76	2·21	3·09	*x*3·28	2·88	2·05	1·58	0·02	−0·56	−0·98	−2·34	−3·01	*n*3·45	−2·73
Y.	−2·31	−2·33	−2·25	−2·37	−2·55	−2·68	−2·56	*n*2·75	−2·31	−0·21	2·11	4·46	6·00	*x*6·18	5·27	3·80	2·20	1·22	0·00	−0·91	−1·53	−2·03	−2·31	−2·13
W.	−1·86	−1·79	−1·02	−1·01	−1·10	−0·77	−0·16	−0·13	−0·20	0·99	2·29	3·26	*x*3·98	3·86	3·12	2·20	0·83	0·12	−0·70	−1·97	−2·45	*n*2·79	−2·60	−2·12
Eq.	−2·68	−2·50	−2·94	−2·49	−2·19	−2·07	−1·99	−2·75	−2·58	−0·31	2·34	5·16	6·95	*x*7·07	5·92	3·86	2·21	1·37	−0·61	−1·32	−2·10	−2·57	*n*3·15	−2·64
S.	−2·39	−2·69	−2·80	−3·61	−4·37	−5·21	*n*5·52	−5·38	−4·14	−1·30	1·70	4·97	7·06	*x*7·60	6·76	5·33	3·56	2·16	1·31	0·55	−0·05	−0·73	−1·18	−1·63

LIII.—INCLINATION (*all days except Feb. 17, 18, Mar. 19, 20, 21, 28, April 7, July 11, 12, 26, Aug. 11, Sept. 27, 28, 29, Oct. 1, 2, Nov. 5*).

Eskdalemuir. **1919.**

	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′
J.	−0·22	−0·17	−0·08	−0·41	−0·54	−0·64	*n*0·76	−0·43	−0·11	0·29	*x*0·53	0·52	0·38	0·20	−0·04	0·24	0·39	0·19	0·10	0·22	0·39	0·19	0·13	−0·37
F.	−0·15	−0·03	−0·06	−0·34	*n*0·56	−0·26	−0·39	−0·28	0·19	0·50	0·74	*x*0·78	0·40	0·30	0·15	0·22	0·20	−0·05	−0·20	−0·22	−0·05	−0·43	−0·17	−0·28
M.	−0·39	−0·47	−0·50	−0·51	*n*0·71	−0·64	−0·35	0·16	0·77	1·38	*x*1·65	1·58	0·75	0·37	0·07	0·06	−0·32	−0·01	−0·35	−0·22	−0·42	−0·40	−0·66	−0·86
A.	−0·63	−0·57	−0·46	−0·37	−0·53	−0·41	−0·13	0·15	0·92	1·69	*x*2·16	1·64	1·04	0·48	0·24	−0·37	−0·56	*n*0·85	−0·78	−0·69	−0·57	−0·40	−0·48	−0·50
M.	−0·32	−0·56	−0·29	−0·39	0·08	0·10	0·67	1·20	1·64	*x*2·01	1·92	1·62	1·04	0·41	−0·17	−0·82	−1·42	*n*1·76	−1·62	−1·26	−0·86	−0·51	−0·37	−0·33
J.	−0·12	−0·22	−0·09	−0·31	−0·13	0·35	0·94	1·49	1·93	*x*2·13	1·92	1·35	0·71	0·06	−0·38	−0·88	−1·16	−1·47	*n*1·62	−1·45	−1·30	−0·97	−0·52	−0·27
J.	−0·54	−0·39	−0·45	−0·34	−0·37	−0·01	0·47	1·00	1·73	*x*2·36	2·30	1·96	1·12	0·31	−0·41	−0·98	−1·18	*n*1·41	−1·18	−0·99	−0·88	−0·96	−0·67	−0·50
A.	−0·46	0·12	−0·40	−0·36	−0·39	−0·15	0·31	0·93	1·56	*x*2·18	1·85	1·24	0·53	0·01	−0·32	−0·52	−0·62	−0·79	−0·98	*n*0·99	−0·88	−0·79	−0·60	−0·52
S.	−0·36	−0·70	−0·86	−0·88	*n*0·95	−0·68	0·00	0·57	1·28	1·81	*x*1·83	1·32	0·59	0·07	−0·18	−0·25	−0·51	−0·38	−0·24	−0·29	−0·52	−0·01	−0·14	−0·49
O.	−0·42	−0·30	−0·53	−0·61	*n*0·79	−0·67	−0·38	0·15	0·65	1·24	*x*1·57	1·46	1·08	0·58	0·09	−0·24	−0·38	−0·14	−0·23	−0·37	−0·48	−0·34	−0·41	−0·50
N.	−0·14	−0·26	−0·34	−0·46	−0·72	*n*0·76	−0·54	−0·25	0·14	0·53	*x*0·68	0·66	0·33	0·18	0·26	0·11	0·06	0·30	0·17	0·07	−0·03	0·10	−0·02	−0·08
D.	−0·07	−0·08	−0·17	−0·40	−0·71	*n*0·81	−0·76	−0·57	0·09	0·51	0·47	*x*0·56	0·28	0·11	0·30	0·21	0·04	0·12	0·06	0·27	0·24	0·24	0·10	−0·01
Y.	−0·32	−0·30	−0·35	−0·45	−0·53	−0·38	−0·08	0·34	0·90	1·39	*x*1·47	1·22	0·69	0·26	−0·03	−0·27	−0·46	−0·52	*n*0·57	−0·49	−0·45	−0·36	−0·32	−0·39
W.	−0·14	−0·13	−0·16	−0·40	*n*0·63	−0·62	−0·61	−0·39	0·08	0·46	0·60	*x*0·63	0·35	0·20	0·17	0·20	0·17	0·14	0·03	0·09	0·14	0·03	0·01	−0·18
Eq.	−0·45	−0·51	−0·59	−0·59	*n*0·75	−0·60	−0·22	0·26	0·90	1·53	*x*1·80	1·50	0·87	0·37	0·05	−0·20	−0·45	−0·35	−0·40	−0·39	−0·50	−0·29	−0·42	−0·59
S.	−0·36	−0·26	−0·31	−0·35	−0·20	0·07	0·60	1·15	1·72	*x*2·17	2·00	1·54	0·85	0·20	−0·32	−0·80	−1·10	*n*1·36	−1·35	−1·17	−0·98	−0·81	−0·54	−0·40

LIV.—HORIZONTAL FORCE (*all days except Feb. 17, 18, Mar. 19, 20, 21, 28, April 7, July 11, 12, 26, Aug. 11, Sept. 27, 28, 29, Oct. 1, 2, Nov. 5*).

Eskdalemuir. **1919.**

	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
J.	0·4	− 0·5	− 3·0	2·3	4·8	6·5	*x* 8·4	3·8	− 0·6	− 6·0	*n* 9·2	− 8·5	− 5·9	− 1·8	2·7	0·2	− 0·3	2·9	4·2	1·8	− 1·5	− 1·1	− 2·7	2·7
F.	− 0·9	− 3·1	− 3·2	0·9	4·6	0·8	3·0	2·1	− 4·6	− 9·0	−12·6	*n*12·7	− 5·7	− 2·4	0·7	0·4	2·5	5·7	8·2	7·0	4·0	*x* 9·2	2·5	2·4
M.	− 1·0	− 0·2	0·6	2·3	6·1	6·4	3·2	− 3·0	−12·2	−22·0	*n*26·7	−25·5	−12·0	− 3·7	4·3	6·3	*x*12·8	8·4	12·7	9·4	9·7	6·7	9·0	8·4
A.	5·7	4·8	3·7	1·3	4·0	3·3	0·2	− 4·0	−15·8	−27·8	*n*35·6	−28·1	−18·2	− 7·3	− 1·1	10·6	16·0	*x*20·6	19·6	16·6	12·3	7·6	6·6	5·0
M.	1·6	3·9	− 1·5	− 0·7	− 7·7	− 7·4	−13·9	−20·5	−28·7	*n*34·0	−33·2	−28·3	−17·5	− 4·6	7·6	20·8	32·0	*x*37·7	34·1	26·9	16·7	9·0	5·1	2·5
J.	0·4	1·8	− 0·5	3·7	2·1	− 5·2	−14·0	−22·8	−30·5	*n*35·1	−33·7	−26·3	−15·4	− 3·0	6·1	16·0	21·7	26·9	*x*29·4	26·3	23·2	16·8	8·4	3·8
J.	6·7	4·0	4·2	3·2	4·1	− 0·5	− 7·5	−15·6	−27·2	−37·7	*n*38·1	−34·0	−20·8	− 7·1	5·6	16·5	22·3	*x*26·7	23·3	19·8	16·8	16·5	11·2	7·6
A.	5·0	− 4·9	3·1	2·8	4·5	2·0	− 4·8	−13·9	−23·9	*n*34·2	−30·6	−22·5	−11·3	− 1·0	6·3	11·7	14·4	17·0	*x*18·8	18·0	15·5	13·2	8·8	6·0
S.	− 2·0	3·0	6·2	8·0	9·6	7·1	− 1·9	−10·1	−20·8	−28·8	*n*29·7	−22·3	− 9·7	0·6	7·7	12·2	*x*17·7	16·2	14·1	11·6	11·8	− 0·3	− 0·7	0·3
O.	4·2	0·7	2·2	2·8	5·8	4·6	0·8	− 5·2	−11·3	−20·0	*n*24·9	−22·5	−15·7	− 6·9	1·8	8·6	*x*13·6	9·6	10·5	11·1	11·1	7·1	5·9	6·2
N.	0·7	2·0	3·1	4·6	8·2	*x* 8·8	5·8	2·0	− 3·3	− 9·9	*n*12·1	−11·3	− 5·7	− 2·4	− 2·0	1·4	4·2	− 0·2	1·0	1·8	2·4	− 0·2	0·4	0·6
D.	− 0·6	− 0·9	0·1	3·5	8·3	*x* 9·8	8·8	6·1	− 3·3	*n* 8·9	− 8·1	− 8·5	− 4·6	− 1·0	− 2·0	− 0·1	2·6	1·4	2·0	− 0·9	− 0·9	− 1·6	− 0·9	− 0·4
Y.	1·7	0·9	1·3	2·9	4·5	3·0	− 1·0	− 6·8	−15·2	−22·8	*n*24·5	−20·9	−11·9	− 3·4	3·1	8·7	13·3	14·4	*x*14·8	12·5	10·1	6·9	4·5	3·8
W.	− 0·1	− 0·6	− 0·7	2·8	6·5	6·5	*x* 6·5	3·5	− 2·9	− 8·5	*n*10·5	−10·3	− 5·5	− 1·9	− 0·2	0·5	2·3	2·5	3·9	2·5	1·0	1·6	− 0·2	1·3
Eq.	1·8	2·1	3·2	3·6	6·4	5·4	0·6	− 5·6	−15·0	−24·7	*n*29·2	−24·6	−13·9	− 4·3	3·2	9·5	*x*15·0	13·7	14·2	12·2	11·2	5·3	5·2	5·0
S.	3·4	1·2	1·3	2·2	0·7	− 2·8	−10·1	−18·2	−27·6	*n*35·2	−33·9	−27·8	−16·3	− 3·9	6·4	16·2	22·6	*x*27·1	26·4	22·7	18·1	13·9	8·4	5·0

x and *n* mark respectively the mean maximum and minimum hourly values in each month or season.

Note.—The corrections formerly applied on account of the effect of the N. Force on the W. Magnetograph, etc., have been ignored this year as insignificant.

LV.-LVII.—INTERNATIONAL QUIET DAYS—DIURNAL INEQUALITIES OF THE GEOGRAPHICAL COMPONENTS OF MAGNETIC FORCE.

Mean Hourly Values, Greenwich Mean Time, for the Months, Year, and Seasons.

Eskdalemuir. LV.—NORTH COMPONENT (*Quiet Days*). **1919.**

Month and Season.	Hour 1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt
	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
J.	1·4	0·5	1·2	2·7	4·8	6·7	x 8·0	6·3	1·0	− 5·9	−11·7	n̄14·8	−13·9	− 8·6	− 3·5	− 0·2	2·7	4·2	5·3	4·8	3·3	2·6	1·1	2·1
F.	1·0	0·1	4·9	6·5	x 8·2	8·0	5·6	2·2	− 2·5	− 7·5	−12·9	n̄15·5	−13·4	− 8·4	− 4·0	− 1·6	− 2·1	− 0·7	4·3	7·9	6·5	5·8	4·6	3·0
M.	6·2	5·4	7·0	7·0	8·4	8·9	8·3	6·9	− 1·7	−15·9	n̄26·1	−26·0	−20·6	−12·8	− 5·4	− 1·0	− 1·2	5·5	7·3	7·1	7·9	x 8·9	7·9	8·0
A.	9·0	7·3	8·4	7·8	8·5	9·1	10·4	5·5	− 5·9	−21·0	−28·8	n̄34·9	−31·5	−23·2	−12·2	− 4·5	6·0	x16·4	13·5	15·0	12·4	11·5	10·7	10·6
M.	6·6	5·8	5·3	4·7	7·6	6·8	2·5	− 1·1	− 8·0	−17·6	−22·9	n̄24·5	−24·2	−22·2	− 9·3	0·9	6·2	x16·3	16·3	15·1	10·2	8·8	9·1	7·5
J.	8·3	8·2	8·9	9·8	11·5	8·8	3·2	− 3·9	−14·4	−24·9	−31·2	n̄33·3	−25·9	−17·2	−10·3	0·0	6·5	13·0	x17·4	17·3	15·8	13·1	10·6	8·7
J.	8·4	9·3	6·5	9·2	11·2	9·1	6·1	− 0·7	−13·4	−28·2	n̄34·1	−33·9	−25·8	−16·8	− 9·5	2·0	8·4	12·7	14·7	x15·8	13·6	12·7	11·9	11·0
A.	5·5	7·0	6·3	8·2	7·5	5·2	− 3·0	− 8·5	−18·2	−27·9	n̄31·0	−28·7	−17·6	− 9·5	− 2·0	5·7	10·4	13·3	16·7	x17·4	13·5	10·8	10·3	8·8
S.	9·0	6·6	7·5	9·0	9·9	10·2	6·3	− 1·1	−12·3	−26·7	n̄35·4	−33·3	−26·2	−18·1	− 9·3	− 1·7	6·9	12·7	x16·8	16·1	16·0	14·0	13·4	9·7
O.	7·9	6·2	6·1	6·8	9·5	11·8	10·7	3·6	− 6·5	−20·2	n̄28·1	−28·0	−24·3	−15·6	− 6·3	− 1·4	2·5	3·6	8·1	8·2	x14·1	11·4	9·7	9·4
N.	1·1	1·2	2·1	3·4	4·5	5·6	x 6·0	2·5	− 3·8	−12·9	n̄15·8	−14·9	−10·8	− 3·7	1·4	2·9	5·0	5·3	5·5	3·8	4·1	3·2	2·7	2·0
D.	− 0·5	0·5	1·5	3·0	5·6	x 5·8	5·7	3·3	− 0·5	− 5·8	n̄ 8·4	− 8·4	− 6·7	− 4·9	− 2·1	0·6	1·0	2·8	1·3	0·3	0·3	2·6	1·8	1·0
Y.	5·3	4·8	5·5	6·5	8·1	8·0	5·8	1·3	− 7·2	−17·9	−23·9	n̄24·7	−20·1	−13·4	− 6·0	0·1	4·4	8·8	10·6	x10·7	9·8	8·8	7·8	6·8
W.	0·7	0·6	2·4	3·9	5·8	x 6·5	6·3	3·6	− 1·4	− 8·0	−12·2	n̄13·4	−11·2	− 6·4	− 2·1	0·4	1·7	2·9	4·1	4·2	3·5	3·5	2·5	2·0
Eq.	8·1	6·4	7·2	7·7	9·1	10·0	8·9	3·7	− 6·6	−21·0	−29·6	n̄30·6	−25·6	−17·4	− 8·3	− 2·1	3·6	9·6	11·4	11·6	x12·6	11·5	10·4	9·4
S.	7·2	7·6	6·7	8·0	9·4	7·5	2·2	− 3·5	−13·5	−24·6	−29·8	n̄30·1	−23·4	−16·4	− 7·8	2·1	7·9	13·8	16·3	x16·4	13·3	11·4	10·5	9·0

Eskdalemuir. LVI.—WEST COMPONENT (*Quiet Days*). **1919.**

	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
J.	− 3·6	− 1·7	− 2·8	− 4·3	− 3·7	− 3·6	− 3·5	− 5·2	− 6·8	− 4·1	1·6	6·8	13·1	x14·4	8·1	5·5	4·2	2·9	2·4	0·2	− 2·3	− 4·4	n̄ 7·1	− 6·0
F.	− 4·1	− 2·4	− 1·5	− 3·3	− 6·0	− 6·5	− 6·6	− 8·0	n̄ 8·2	− 4·0	3·3	9·1	x16·0	14·1	8·2	3·6	1·1	1·8	0·7	0·1	− 0·4	− 1·3	− 3·0	− 2·6
M.	− 2·7	− 4·8	− 6·4	− 7·3	− 7·9	− 6·2	− 8·4	−14·7	n̄19·1	−14·0	− 4·0	8·7	18·7	x21·0	18·0	10·5	5·1	4·4	1·0	1·1	4·1	3·4	1·4	− 1·9
A.	− 2·9	− 2·9	− 6·6	− 8·2	− 9·7	−11·1	−15·9	−22·4	n̄23·0	−18·9	− 9·3	4·1	18·2	x25·4	24·1	15·9	13·0	10·0	5·0	6·7	5·7	2·6	0·8	− 0·5
M.	− 2·3	− 3·1	− 5·6	− 8·6	−12·3	−21·5	−26·2	n̄28·2	−23·1	−15·1	− 5·2	8·2	19·5	x22·3	20·8	18·6	15·5	13·5	10·6	9·6	6·1	5·7	1·6	− 1·0
J.	− 1·5	− 1·3	− 3·4	−10·3	−18·6	−27·4	−31·3	n̄32·2	−28·1	−17·1	− 4·6	11·3	24·4	x28·8	26·5	23·2	16·5	13·3	10·4	8·3	6·4	4·2	2·5	− 0·2
J.	− 2·5	− 4·5	− 3·9	− 9·0	−15·4	−20·6	−28·2	−34·3	n̄35·3	−24·3	−10·3	7·9	22·8	x32·5	31·6	27·8	20·5	12·7	6·9	7·5	6·8	5·6	3·6	2·2
A.	− 4·3	− 5·1	− 7·3	−11·7	−15·5	−20·9	n̄22·1	−20·9	−17·9	−10·7	5·1	21·3	x32·4	31·0	23·0	13·2	7·2	4·4	3·0	2·6	0·0	− 1·2	− 1·4	− 4·4
S.	− 8·6	− 5·5	− 7·1	− 6·7	−10·3	−14·5	−19·1	n̄21·2	−20·6	−11·5	0·2	15·5	25·2	x25·8	21·9	15·0	9·2	6·8	7·9	5·3	2·7	0·8	− 4·3	− 6·7
O.	− 3·3	− 3·3	− 4·3	− 3·1	− 1·9	− 4·3	− 8·5	−16·5	n̄21·9	−18·1	− 5·3	11·3	20·1	x24·1	18·7	14·1	11·7	8·3	6·9	3·7	− 4·9	− 8·5	− 7·7	− 7·1
N.	− 4·6	− 3·8	− 2·6	− 2·2	− 2·4	− 3·4	− 4·8	− 7·2	n̄ 9·6	− 6·0	3·0	9·2	x10·8	9·4	7·0	5·4	4·2	2·6	1·0	− 0·2	− 0·8	− 1·0	− 2·0	− 2·6
D.	− 1·4	− 1·7	− 2·0	− 1·1	− 2·0	− 0·9	− 1·1	− 4·0	− 6·3	− 1·0	4·3	6·4	10·0	x10·9	9·2	5·9	4·2	2·9	− 0·1	− 3·4	− 6·7	− 7·4	n̄ 8·7	− 6·0
Y.	− 3·5	− 3·3	− 4·5	− 6·3	− 8·8	−11·7	−14·7	−17·9	n̄18·3	−12·1	− 1·8	10·0	19·3	x21·6	18·1	13·2	9·4	7·0	4·6	3·5	1·4	− 0·1	− 2·0	− 3·1
W.	− 3·4	− 2·4	− 2·2	− 2·7	− 3·5	− 3·6	− 4·0	− 6·1	n̄ 7·7	− 3·8	3·1	7·9	x12·5	12·2	8·1	5·1	3·4	2·6	1·0	− 0·8	− 2·6	− 3·5	− 5·2	− 4·3
Eq.	− 4·4	− 4·1	− 6·1	− 6·3	− 7·5	− 9·0	−13·0	−18·7	n̄21·2	−15·6	− 4·6	9·9	20·5	x24·1	20·7	13·9	9·7	7·4	5·2	4·2	1·9	− 0·4	− 2·5	− 4·0
S.	− 2·6	− 3·5	− 5·0	− 9·9	−15·4	−22·6	−27·0	n̄28·9	−26·1	−16·8	− 3·8	12·2	24·8	x28·6	25·5	20·7	15·0	11·0	7·7	7·0	4·8	3·6	1·6	− 0·9

Eskdalemuir. LVII.—VERTICAL COMPONENT (*Quiet Days*). **1919.**

	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
J.	− 0·3	− 1·0	− 1·8	− 2·1	n̄ 2·4	− 2·3	− 1·8	− 1·5	− 0·4	0·5	− 0·6	− 0·9	− 2·2	− 0·7	− 1·8	1·7	1·3	1·0	1·7	1·8	2·3	x 2·6	2·1	1·2
F.	1·7	1·7	− 0·1	− 0·1	− 0·1	− 0·1	− 0·1	− 0·5	− 1·7	− 3·3	− 4·3	n̄ 4·3	− 1·7	0·9	1·7	x 2·1	1·5	1·3	1·3	1·1	1·1	1·1	1·1	0·9
M.	0·7	− 0·1	− 1·3	− 1·2	− 0·8	− 1·3	0·1	1·6	− 0·6	− 4·8	− 7·9	−10·3	n̄11·0	− 6·8	0·1	5·9	x 7·5	6·4	6·4	6·3	4·5	3·6	2·2	0·8
A.	2·8	4·2	5·0	4·9	4·7	3·5	3·2	1·4	− 2·0	− 5·5	−10·3	−14·3	n̄16·2	−11·2	− 4·8	0·1	2·5	5·1	x 6·2	5·0	4·4	4·5	3·7	3·1
M.	4·1	4·4	4·6	2·9	0·5	0·4	− 1·0	− 3·1	− 6·3	−11·4	−14·8	n̄15·5	−11·3	− 6·2	− 2·0	3·5	7·1	7·8	x 8·2	6·9	7·3	6·2	4·6	2·7
J.	1·9	2·0	1·6	3·2	3·5	3·5	1·7	1·4	− 1·6	− 7·4	−13·4	n̄17·1	−13·9	− 9·1	− 2·0	2·0	6·5	x 7·7	6·7	6·4	6·0	4·4	3·3	2·9
J.	1·0	1·9	2·8	3·9	4·6	4·5	3·6	1·9	0·6	− 3·7	− 8·4	−13·1	n̄13·4	− 9·1	− 4·0	− 0·9	3·6	x 5·9	5·4	4·3	3·4	2·1	1·4	1·1
A.	1·6	− 0·3	− 0·2	1·5	3·4	3·5	2·3	0·0	− 2·9	− 7·2	−11·9	n̄15·6	−12·5	− 4·2	2·3	6·0	x 9·1	8·6	6·0	4·3	2·6	2·1	1·2	0·3
S.	− 1·2	− 0·3	0·1	− 0·2	0·7	2·1	2·8	3·2	0·3	− 3·7	− 7·3	n̄ 9·9	− 8·0	− 3·8	0·8	3·8	x 5·4	3·6	2·0	2·7	2·8	2·8	1·4	0·1
O.	− 2·3	− 1·6	− 1·0	− 0·9	− 1·4	− 1·3	0·4	3·0	2·1	− 1·6	− 5·4	n̄ 8·1	− 6·0	− 1·3	2·4	4·0	x 4·7	4·6	3·7	3·1	2·2	1·1	0·2	− 0·6
N.	0·4	0·3	− 0·8	− 0·9	− 1·2	− 1·5	n̄ 1·6	− 0·9	0·6	− 1·5	− 1·2	− 0·6	0·7	2·4	x 2·7	1·6	0·5	− 0·4	− 0·3	0·6	0·1	0·2	0·3	0·4
D.	− 2·2	n̄ 2·4	− 2·2	− 2·3	− 2·1	− 2·1	− 2·1	− 1·0	− 0·2	− 0·4	− 0·8	− 1·3	− 2·3	− 0·5	0·9	2·1	2·4	2·4	2·8	3·4	x 3·7	2·3	1·7	0·3
Y.	0·7	0·7	0·6	0·7	0·8	0·7	0·6	0·5	− 0·9	− 4·0	− 7·1	n̄ 9·2	− 8·4	− 4·4	− 0·1	2·6	4·4	x 4·5	4·2	3·8	3·4	2·8	1·9	1·1
W.	− 0·1	− 0·4	− 1·2	− 1·3	− 1·4	− 1·5	− 1·4	− 0·9	− 0·1	− 0·8	− 1·5	− 1·8	n̄ 2·0	− 0·1	1·6	1·8	1·6	1·1	1·4	1·8	x1·8	1·5	1·3	0·7
Eq.	0·0	0·5	0·7	0·7	0·8	0·7	1·6	2·3	− 0·1	− 3·9	− 7·7	n̄10·7	−10·3	− 5·8	− 0·4	3·5	x 5·0	4·9	4·6	4·3	3·5	3·0	1·9	0·9
S.	2·2	2·0	2·2	2·9	3·0	3·0	1·7	0·1	− 2·6	− 7·4	−12·1	n̄15·3	−12·8	− 7·1	− 1·4	2·7	6·6	x 7·5	6·6	5·5	4·8	3·7	2·6	1·8

x and n̄ mark respectively the mean maximum and minimum hourly values in each month or season.

LVIII.–LX.—INTERNATIONAL QUIET DAYS—DIURNAL INEQUALITIES.

Mean Hourly Values, Greenwich Mean Time, for the Months, Years, and Seasons.

LVIII.—DECLINATION (measured positive towards the West) *Quiet Days.*

Eskdalemuir. **1919.**

Month and Season.	Hour 1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.
	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′
J.	−0·80	−0·37	−0·62	−1·00	−1·02	−1·11	−1·17	−1·39	−1·40	−0·45	1·03	2·22	x3·41	3·36	1·81	1·09	0·66	0·32	0·16	−0·26	−0·66	−1·02	n̄1·46	−1·30
F.	−0·86	−0·48	−0·60	−1·03	−1·68	n̄1·77	−1·64	−1·70	−1·47	−0·34	1·42	2·74	x3·96	3·28	1·85	0·82	0·34	0·39	−0·13	−0·45	−0·47	−0·61	−0·87	−0·68
M.	−0·91	−1·27	−1·69	−1·86	−2·07	−1·75	−2·16	−3·31	n̄3·67	−1·80	0·78	3·29	x4·92	4·91	3·87	2·13	1·07	0·54	−0·25	−0·21	0·33	0·14	−0·21	−0·85
A.	−1·11	−1·02	−1·80	−2·09	−2·41	−2·74	−3·77	n̄4·74	−4·18	−2·45	−0·10	2·90	5·48	x6·40	5·48	3·40	2·21	0·98	0·17	0·42	0·37	−0·17	−0·49	−0·73
M.	−0·84	−0·97	−1·41	−1·98	−2·87	−4·65	−5·30	n̄5·50	−4·06	−1·92	0·36	3·08	5·30	x5·72	4·66	3·60	2·69	1·68	1·12	0·98	0·60	0·59	−0·23	−0·65
J.	−0·78	−0·75	−1·20	−2·60	−4·33	−5·91	n̄6·33	−6·07	−4·63	−1·86	0·97	4·22	6·35	x6·67	5·81	4·55	2·85	1·82	0·99	0·60	0·32	0·03	−0·15	−0·56
J.	−0·99	−1·44	−1·16	−2·30	−3·69	−4·58	−5·90	n̄6·67	−6·11	−3·07	0·02	3·57	6·02	x7·36	6·76	5·32	3·52	1·73	0·47	0·52	0·52	0·34	−0·01	−0·24
A.	−1·17	−1·42	−1·81	−2·79	−3·50	n̄4·42	−4·18	−3·61	−2·44	−0·44	2·86	5·91	x7·46	6·69	4·66	2·27	0·80	0·08	−0·41	−0·54	−0·81	−0·89	−0·90	−1·40
S.	−2·24	−1·48	−1·84	−1·87	−2·63	−3·46	n̄4·14	−4·11	−3·32	−0·66	2·15	5·05	x6·53	6·16	4·87	3·06	1·39	0·58	0·55	0·07	−0·43	−0·69	−1·65	−1·91
O.	−1·13	−1·03	−1·22	−1·02	−0·95	−1·56	−2·32	−3·47	n̄3·93	−2·36	−0·62	3·90	5·41	x5·68	4·06	2·86	2·15	1·42	0·87	0·23	−1·81	−2·36	−2·10	−1·97
N.	−0·97	−0·82	−0·63	−0·63	−0·74	−1·00	−1·30	−1·57	n̄1·66	−0·41	1·54	2·71	x2·78	2·08	1·30	0·90	0·53	0·20	−0·13	−0·26	−0·40	−0·39	−0·55	−0·63
D.	−0·25	−0·37	−0·49	−0·40	−0·73	−0·52	−0·57	−0·99	−1·22	0·15	1·35	1·77	2·37	x2·43	1·93	1·13	0·77	0·41	−0·10	−0·69	−1·34	−1·61	n̄1·82	−1·24
Y.	−1·00	−0·95	−1·21	−1·63	−2·22	−2·79	−3·23	n̄3·59	−3·17	−1·30	1·08	3·45	5·00	x5·06	3·92	2·59	1·58	0·85	0·28	0·04	−0·32	−0·55	−0·87	−1·01
W.	−0·72	−0·51	−0·58	−0·77	−1·04	−1·10	−1·17	−1·41	n̄1·44	−0·26	1·34	2·36	x3·13	2·79	1·72	0·98	0·58	0·33	−0·05	−0·42	−0·72	−0·91	−1·18	−0·96
Eq.	−1·35	−1·20	−1·64	−1·71	−2·02	−2·38	−3·10	n̄3·91	−3·77	−1·82	0·86	3·79	5·59	x5·79	4·57	2·86	1·71	0·88	0·33	0·13	−0·39	−0·77	−1·11	−1·36
S.	−0·94	−1·14	−1·39	−2·42	−3·60	−4·89	−5·43	n̄5·46	−4·31	−1·83	1·05	4·19	6·28	x6·61	5·47	3·94	2·47	1·33	0·54	0·39	0·16	0·02	−0·32	−0·71

LIX.—INCLINATION (*Quiet Days*).

Eskdalemuir. **1919.**

	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′
J.	−0·03	−0·03	−0·07	−0·14	−0·29	−0·41	n̄0·49	−0·34	0·06	0·47	0·70	x0·79	0·58	0·25	0·11	−0·05	−0·22	−0·30	−0·34	−0·26	−0·11	−0·01	0·12	0·01
F.	0·06	0·08	−0·29	−0·35	−0·41	−0·39	−0·23	0·02	0·31	0·52	0·68	x0·71	0·44	0·22	0·12	0·08	0·16	0·05	−0·26	n̄0·48	−0·38	−0·32	−0·21	−0·12
M.	−0·33	−0·25	−0·35	−0·34	−0·41	−0·48	−0·36	−0·12	0·47	1·17	x1·55	1·24	0·68	0·24	−0·01	0·00	0·16	−0·28	−0·33	−0·32	−0·48	n̄0·55	−0·48	−0·45
A.	−0·45	−0·31	−0·28	−0·22	−0·24	−0·28	−0·27	0·13	0·78	1·58	1·77	x1·80	1·26	0·71	0·19	−0·02	−0·58	n̄1·13	−0·81	−0·97	−0·80	−0·67	−0·61	−0·59
M.	−0·28	−0·20	−0·12	−0·06	−0·23	−0·01	0·33	0·54	0·81	1·14	x1·20	1·02	0·89	0·83	0·14	−0·34	−0·52	n̄1·11	−1·05	−0·98	−0·59	−0·52	−0·50	−0·39
J.	−0·45	−0·45	−0·46	−0·35	−0·29	0·06	0·45	0·92	1·43	1·75	x1·75	1·48	0·84	0·32	0·09	−0·41	−0·58	−0·90	n̄1·15	−1·11	−0·99	−0·81	−0·65	−0·49
J.	−0·47	−0·46	−0·27	−0·31	−0·30	−0·06	0·25	0·76	1·56	x2·19	2·18	1·69	0·87	0·21	−0·11	−0·69	−0·85	−0·91	−0·94	n̄1·05	−0·92	−0·87	−0·80	−0·72
A.	−0·23	−0·36	−0·27	−0·26	−0·09	0·16	0·68	0·95	1·45	x1·82	1·59	1·04	0·19	−0·10	−0·27	−0·47	−0·58	−0·72	−0·98	n̄1·06	−0·80	−0·62	−0·60	−0·47
S.	−0·44	−0·33	−0·34	−0·45	−0·42	−0·32	0·04	0·57	1·20	1·84	x2·08	1·59	0·99	0·56	0·19	−0·09	−0·49	−0·86	n̄1·18	−1·07	−1·01	−0·85	−0·74	−0·49
O.	−0·50	−0·38	−0·33	−0·40	−0·61	−0·71	−0·51	0·16	0·90	1·61	x1·77	1·38	1·02	0·50	0·10	−0·09	−0·27	−0·28	−0·57	−0·52	n̄0·76	−0·54	−0·47	−0·48
N.	0·03	0·01	−0·10	−0·20	−0·27	−0·33	−0·34	−0·05	0·44	0·91	x0·92	0·76	0·50	0·12	−0·16	−0·25	−0·39	n̄0·40	−0·38	−0·23	−0·25	−0·18	−0·13	−0·07
D.	0·01	−0·06	−0·12	−0·23	−0·37	n̄0·41	−0·40	−0·16	0·15	0·38	x0·43	0·38	0·18	0·09	−0·03	−0·10	−0·09	−0·18	−0·01	0·13	0·20	0·04	0·10	0·06
Y.	−0·26	−0·23	−0·25	−0·28	−0·33	−0·27	−0·07	0·28	0·80	1·28	x1·39	1·16	0·70	0·33	0·03	−0·20	−0·35	−0·59	n̄0·67	−0·66	−0·57	−0·49	−0·41	−0·35
W.	0·02	0·00	−0·14	−0·23	−0·34	n̄0·39	−0·36	−0·13	0·24	0·57	x0·68	0·66	0·42	0·17	0·01	−0·08	−0·13	−0·21	−0·25	−0·21	−0·13	−0·12	−0·03	−0·03
Eq.	−0·43	−0·32	−0·33	−0·35	−0·42	−0·45	−0·28	0·19	0·84	1·55	x1·80	1·50	0·99	0·50	0·12	−0·05	−0·29	−0·64	−0·72	−0·72	n̄0·76	−0·65	−0·58	−0·50
S.	−0·36	−0·37	−0·28	−0·25	−0·23	0·04	0·43	0·79	1·31	x1·72	1·68	1·31	0·70	0·32	−0·04	−0·48	−0·63	−0·91	−1·03	n̄1·05	−0·83	−0·70	−0·64	−0·52

LX.—HORIZONTAL FORCE (*Quiet Days*).

Eskdalemuir. **1919.**

	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
J.	0·3	0·0	0·4	1·3	3·5	5·4	x 6·6	4·5	− 1·1	− 6·9	−10·7	n̄12·1	− 9·4	− 4·0	− 1·0	1·4	3·8	4·9	5·8	4·6	2·4	1·2	− 1·1	0·3
F.	− 0·3	− 0·6	4·2	5·2	6·1	5·8	3·4	− 0·3	− 4·8	− 8·3	−11·4	n̄12·2	− 8·1	− 3·9	− 1·4	− 0·5	− 1·6	− 0·1	4·3	x 7·6	6·1	5·2	3·5	2·1
M.	5·1	3·8	4·8	4·6	5·8	6·7	5·5	2·3	− 7·2	−19·3	n̄26·1	−22·3	−14·2	− 6·1	0·1	2·2	0·4	6·5	7·2	7·1	8·8	x 9·5	8·0	7·1
A.	7·8	6·1	6·1	5·1	5·3	5·5	5·3	− 1·4	−12·4	−25·6	−30·2	n̄32·2	−24·7	−14·8	− 4·6	0·4	9·5	x18·6	14·4	16·3	13·5	11·7	10·5	10·0
M.	5·6	4·7	3·4	2·0	3·7	0·3	− 5·3	− 9·3	−14·4	−21·2	n̄23·4	−21·0	−17·5	−14·7	− 2·8	6·3	10·4	x19·5	18·7	17·3	11·5	10·1	9·2	6·9
J.	7·5	7·4	7·5	6·4	5·6	0·4	− 6·1	−13·2	−22·0	−28·8	n̄31·1	−28·5	−17·7	− 8·1	− 2·1	6·8	11·1	16·3	x19·6	18·9	17·0	13·7	10·9	8·3
J.	7·3	7·5	5·1	6·1	6·2	2·6	− 2·4	−10·6	−23·1	−34·0	n̄35·6	−30·1	−18·0	− 6·6	0·1	10·0	14·0	15·8	16·1	x17·2	15·0	13·7	12·4	11·1
A.	4·0	5·2	3·9	4·4	2·6	− 1·2	− 9·3	−14·2	−22·6	n̄29·8	−28·2	−21·3	− 7·4	− 0·1	4·8	9·3	12·0	14·0	16·9	x17·5	12·9	10·0	9·5	7·1
S.	6·2	4·8	5·1	6·7	6·5	5·6	0·5	− 7·3	−17·8	−28·9	n̄33·8	−27·3	−17·8	− 9·8	− 2·5	2·7	9·2	14·1	x18·4	17·0	16·0	13·7	11·6	7·3
O.	6·6	5·0	4·6	5·6	8·6	10·1	7·8	− 1·3	−12·6	−24·6	n̄28·4	−23·5	−17·4	− 7·9	− 0·6	2·8	5·8	5·9	9·8	9·0	x12·1	8·5	7·1	7·0
N.	− 0·3	0·0	1·2	2·6	3·6	4·3	4·4	0·3	− 6·4	−14·1	n̄14·2	−11·6	− 7·2	− 0·8	3·4	4·3	x 6·0	5·8	5·6	3·6	3·7	2·8	2·0	1·2
D.	− 0·9	0·0	0·9	2·5	4·8	x 5·3	5·1	2·0	− 2·3	− 5·9	n̄ 6·8	− 6·1	− 3·5	− 1·5	0·7	2·3	2·2	3·6	1·2	− 0·7	− 1·6	0·3	− 0·8	− 0·7
Y.	4·1	3·7	3·9	4·4	5·2	4·2	1·3	− 4·0	−12·2	−20·6	n̄23·3	−20·7	−13·6	− 6·5	− 0·5	4·0	6·9	10·4	x11·5	11·3	9·8	8·4	6·9	5·6
W.	− 0·3	− 0·2	1·7	2·9	4·5	x 5·2	4·9	1·6	− 3·6	− 8·8	n̄10·8	−10·5	− 7·1	− 2·6	0·4	1·9	2·6	3·5	4·2	3·8	2·7	2·4	0·9	0·7
Eq.	6·4	4·9	5·1	5·5	6·5	6·9	4·7	− 1·9	−12·5	−24·6	n̄29·6	−26·3	−18·5	− 9·7	− 1·9	2·0	6·2	11·3	12·4	12·3	x12·6	10·9	9·3	7·8
S.	6·1	6·2	5·0	4·7	4·5	0·5	− 5·8	−11·8	−20·5	−28·5	n̄29·6	−25·2	−15·1	− 7·3	0·0	8·1	11·9	16·4	x17·8	17·7	14·4	11·9	10·5	8·4

x and *n̄* mark respectively the mean maximum and minimum hourly values in each month or season.

Note—The corrections formerly applied on account of the effect of the N. Force on the W. Magnetograph, etc., have been ignored this year as insignificant.

LX*a*.-LX*c*.—SELECTED DISTURBED DAYS—DIURNAL INEQUALITIES OF THE GEOGRAPHICAL COMPONENTS OF MAGNETIC FORCE.

Mean Hourly Values, Greenwich Mean Time, for the Months, Year, and Seasons.

Eskdalemuir. LX*a*.—NORTH COMPONENT (*Disturbed Days*). **1919.**

Month and Season.	Hour 1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Mid
	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
J.	− 2·3	0·7	n13·1	− 3·1	5·0	8·0	11·5	1·2	− 3·8	− 4·1	− 4·9	− 5·8	− 0·4	4·1	2·6	− 5·2	− 7·3	− 0·5	5·6	x19·7	− 0·9	0·0	− 7·4	0·
F.	3·4	2·9	−13·1	4·6	8·3	−11·7	−3·6	− 0·1	−13·0	−14·2	−22·1	n29·4	−14·7	−10·9	0·0	− 2·5	17·4	17·9	x23·1	16·4	6·1	10·2	11·4	13·
M.	− 6·6	−10·0	−11·6	− 5·2	14·2	1·6	4·6	− 9·4	−10·6	−24·6	−36·8	n47·8	−15·4	− 3·2	10·6	5·8	24·8	18·6	x34·8	23·0	13·6	20·8	1·8	6·
A.	− 3·7	− 4·3	− 0·8	− 5·4	16·1	0·3	−14·0	− 6·2	−20·3	−36·5	n46·8	−31·8	−14·9	− 6·7	− 3·2	24·0	28·7	24·5	x31·6	29·4	22·9	3·9	12·0	1·
M.	0·6	8·1	−19·0	− 7·2	−37·9	−27·7	−43·8	−54·8	n57·1	−52·8	−41·0	−35·1	−14·1	3·2	14·2	45·1	74·2	x85·2	55·1	36·7	29·8	15·3	14·7	8·
J.	3·9	5·5	− 6·1	5·7	10·5	3·5	−11·5	−19·5	−31·1	n37·6	−37·2	−34·2	−19·6	− 6·3	11·0	17·4	18·6	20·4	x28·4	27·8	28·2	13·0	6·5	2·
J.	7·1	2·1	6·5	− 4·7	7·4	4·4	− 3·4	− 6·2	−24·2	−38·0	−40·8	n41·2	−34·4	−22·6	− 2·4	20·6	29·1	x39·1	32·7	16·9	16·7	15·7	14·3	5·
A.	5·3	−40·4	1·4	− 4·7	19·2	14·2	−43·1	−62·2	n78·0	−71·5	−43·2	−34·8	−32·5	3·8	75·2	60·1	x83·4	33·0	27·1	33·8	23·2	18·7	13·8	− 1·
S.	−15·2	8·6	13·1	14·1	9·9	4·2	− 8·0	−18·3	−28·3	n32·9	−30·4	−31·0	−12·6	2·8	16·9	23·7	x30·3	19·2	27·2	15·2	21·3	−12·3	−14·4	− 3·
O.	−26·2	−30·2	−26·4	−20·0	−12·8	−10·8	n32·3	−27·1	−17·3	−15·5	−23·9	−23·3	−14·5	− 9·5	12·3	44·5	x68·5	44·9	40·1	46·0	33·2	26·6	2·6	−29·
N.	1·5	2·6	5·8	7·4	15·4	x17·9	10·7	4·7	− 2·2	− 8·4	−10·8	−13·2	− 4·0	− 9·5	−17·9	− 7·3	2·7	n15·0	− 7·2	3·8	14·0	3·7	1·7	3·
D.	7·5	7·9	9·0	12·4	x19·7	16·1	7·4	4·2	−24·7	n36·7	−25·6	−20·4	− 9·5	− 1·1	−10·6	− 4·8	− 2·9	7·3	7·6	2·2	9·9	11·7	5·6	7·
Y.	− 2·1	− 3·9	− 4·5	− 0·5	6·2	1·7	−10·5	−16·2	−25·9	n31·1	−30·3	−29·0	−15·6	− 4·7	9·1	18·5	x30·6	24·5	25·5	22·6	18·2	10·6	5·2	1·
W.	2·5	3·5	− 2·9	5·3	x12·1	7·6	6·5	2·5	−10·9	−15·8	−15·8	n17·2	− 7·2	− 4·3	− 6·5	− 5·0	2·4	2·4	7·3	10·5	7·3	6·4	2·9	6·
Eq.	−12·9	− 9·0	− 6·4	− 4·1	6·8	− 1·2	−12·4	−15·2	−19·1	−27·4	n34·5	−33·5	−14·3	− 4·2	9·2	24·5	x38·1	26·8	33·4	28·4	22·8	9·8	0·5	− 6·
S.	4·2	− 6·2	− 4·3	− 2·7	− 0·2	− 1·4	−25·5	−35·7	−47·6	n50·0	−40·5	−36·3	−25·2	− 5·5	24·5	35·8	x51·3	44·4	35·8	28·8	24·5	15·7	12·3	3·

Eskdalemuir. LX*b*.—WEST COMPONENT (*Disturbed Days*). **1919.**

	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
J.	−16·3	−33·8	−12·6	− 4·2	0·2	2·0	7·1	9·1	9·7	21·5	21·3	30·9	x34·6	31·2	26·2	10·2	− 4·0	11·4	8·7	n54·3	−39·3	−17·5	−29·5	−12·
F.	−13·7	n34·3	−23·2	−13·2	− 8·5	1·9	17·2	17·4	12·1	13·5	20·8	19·6	x31·5	31·5	28·2	12·6	− 2·1	−26·5	−31·2	−32·6	− 9·5	− 0·7	− 7·6	− 3·
M.	−11·3	−23·6	−30·6	−15·3	− 0·2	− 3·1	2·6	− 4·5	− 2·3	6·2	14·1	23·2	40·3	x49·6	35·4	21·5	7·8	− 3·7	n35·2	−22·5	− 3·3	−31·6	−12·9	− 0·
A.	−15·9	−13·5	− 7·9	− 1·6	0·4	− 6·4	−10·4	− 3·2	− 9·2	1·4	8·6	29·4	38·6	x45·0	44·8	31·0	18·5	14·5	− 2·9	− 9·9	−41·9	n45·3	−30·9	−33·
M.	−21·6	−40·7	−30·9	n51·8	−11·9	−15·0	−23·2	−18·1	−23·4	− 6·7	1·3	16·0	29·5	41·3	37·6	x46·1	43·2	37·2	26·7	6·8	− 2·1	−13·8	−13·0	−13·
J.	−25·1	−25·2	−19·7	−10·3	−23·2	−36·7	n39·8	−37·7	−28·0	−11·8	2·5	21·8	37·3	42·0	x47·5	42·5	34·4	25·3	21·0	10·3	3·2	− 4·4	− 9·9	−16·
J.	−13·6	−12·1	−22·6	−14·1	−22·8	−27·7	−31·3	n41·6	−36·3	−23·8	− 7·9	11·6	27·5	38·8	x44·1	44·0	38·1	35·5	21·8	12·7	6·0	− 3·7	−12·2	−10·
A.	−15·1	−20·9	− 4·8	−21·3	−34·7	−37·8	−31·1	n60·1	−48·2	−20·3	− 2·5	17·8	23·1	47·3	x54·8	50·5	51·7	40·0	20·7	6·7	− 2·6	−10·9	− 4·5	2·
S.	−45·7	n49·7	−47·0	−22·9	−12·9	− 5·2	1·4	1·9	− 9·4	− 1·7	10·5	23·4	42·4	50·9	x60·0	44·6	41·5	36·8	− 2·3	6·3	−13·0	−23·5	−47·9	−38·
O.	−34·1	−31·5	−27·0	−25·8	−22·7	−15·2	− 5·7	−19·5	−22·6	−12·3	− 1·9	15·2	26·9	32·5	44·6	x57·7	52·3	21·4	23·1	16·6	− 4·4	3·7	n38·5	−32·
N.	−13·8	− 9·4	− 4·6	− 5·2	− 5·7	− 5·7	− 4·5	− 5·4	− 4·8	1·6	5·5	14·1	20·3	34·8	33·2	x41·4	25·7	9·7	− 4·1	−23·2	n29·0	−26·8	−26·1	−17·
D.	−10·8	− 9·6	− 7·3	− 5·5	− 4·0	− 2·0	17·1	19·7	3·2	10·6	12·1	8·7	17·6	x19·6	18·9	17·5	18·4	− 9·0	− 8·3	− 7·5	−21·6	n34·2	−26·1	−17·
Y.	−19·7	n25·4	−19·9	−15·9	−12·2	−12·6	− 8·4	−11·8	−13·3	− 1·8	7·0	19·3	30·8	38·7	x39·6	35·0	27·1	16·1	3·2	− 7·5	−13·1	−17·4	−21·6	−16·
W.	−13·6	−21·8	−11·9	− 7·0	− 4·5	− 1·0	9·2	10·2	5·0	11·8	14·9	18·3	26·0	x29·3	26·6	20·4	9·5	− 3·6	− 8·8	n29·4	−24·9	−19·8	−22·3	−12·
Eq.	−26·7	−29·6	−28·1	−16·4	− 8·9	− 7·5	− 3·0	− 6·3	−10·9	− 1·6	7·8	22·8	37·1	44·5	x46·2	38·7	30·0	17·3	− 4·3	− 2·4	−15·7	−24·2	n32·6	−26·
S.	−18·9	−24·7	−19·5	−24·4	−23·1	−29·3	−31·4	n39·4	−34·0	−15·6	− 1·6	16·8	29·4	42·4	x46·0	45·8	41·9	34·5	22·5	9·1	1·1	− 8·2	− 9·9	− 9·

Eskdalemuir. LX*c*.—VERTICAL COMPONENT (*Disturbed Days*). **1919.**

	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
J.	−15·7	−15·6	n29·0	−25·2	−19·5	−15·1	−13·6	−11·8	−10·7	−11·3	− 9·7	− 7·0	0·0	4·3	8·9	24·3	45·4	x45·6	38·1	27·1	23·8	3·0	−13·6	−22·
F.	−15·5	−22·2	−28·4	n29·2	−27·8	−23·8	−22·4	−14·5	− 8·5	− 3·3	− 0·7	4·5	9·3	12·7	19·4	24·8	x30·8	28·4	31·8	22·9	16·1	10·3	0·5	−15·
M.	n49·6	−44·0	−34·8	−35·5	−35·6	−18·7	−10·2	− 1·9	0·7	− 1·4	− 0·2	11·4	31·6	41·8	x55·1	50·3	46·6	39·8	29·7	6·3	− 8·5	−16·9	−23·4	−32·
A.	−42·7	−40·5	−35·5	−49·4	n51·8	−33·4	−19·2	−15·5	− 9·9	− 4·7	− 0·1	10·4	21·0	25·0	34·0	53·9	x63·3	54·9	49·7	31·6	17·8	− 3·4	−26·0	−29·
M.	−18·4	−38·5	−64·9	−78·9	n79·7	−72·7	−49·1	−29·5	−38·5	−14·9	− 8·1	0·7	14·7	35·1	57·6	75·2	x85·4	85·2	70·4	52·8	13·2	− 2·8	3·6	2·
J.	−20·1	−18·3	n24·0	−22·0	−11·1	− 6·7	− 1·6	− 1·6	− 2·0	− 5·3	−11·7	−13·6	− 8·2	2·7	12·5	24·9	x29·6	27·2	23·5	19·3	14·4	5·8	− 1·2	−12·
J.	−10·3	−22·3	−29·9	−29·3	n32·0	−21·0	−14·2	− 9·4	− 7·2	− 8·0	−11·0	−12·6	− 8·2	0·0	6·5	19·5	38·5	x40·5	39·5	33·9	22·1	12·5	5·7	− 3·
A.	−31·3	−47·9	−51·4	n52·2	−37·2	−20·5	−13·5	−11·1	− 6·6	−12·4	−10·6	− 1·3	6·7	13·9	42·2	61·2	62·6	x62·7	46·5	23·7	14·6	15·6	−11·0	−42·
S.	−79·1	n82·6	−64·4	−60·3	−59·7	−43·7	−30·2	−23·0	−15·5	− 6·9	1·4	6·8	19·0	38·7	63·7	86·6	89·2	x89·5	84·1	50·9	33·4	− 8·4	−27·7	−61·
O.	−27·8	−26·7	−26·3	−29·3	−29·1	−32·2	n38·0	−36·0	−26·1	−22·3	−19·3	−16·3	−11·2	− 5·6	− 4·5	11·8	59·5	96·3	x97·7	59·1	33·2	29·4	− 1·6	−34·
N.	−13·7	−15·0	−17·0	−18·2	−18·1	n18·9	−18·1	−15·8	−14·4	−16·2	−16·7	−14·5	−10·9	− 3·8	11·4	23·8	x58·1	48·9	35·1	24·6	13·6	7·2	− 1·7	− 9·
D.	− 9·4	−14·0	−18·0	−20·2	−18·8	−17·6	−21·9	n24·5	−17·5	− 7·9	− 4·7	5·3	0·1	4·7	21·7	24·7	x28·7	28·2	23·8	26·6	13·6	8·0	− 3·8	− 7·
Y.	−27·8	−32·3	−35·3	n37·5	−35·0	−27·0	−21·0	−16·2	−13·0	− 9·6	− 7·6	− 2·2	5·3	14·1	27·4	40·1	53·1	x53·9	47·5	31·6	17·3	5·0	− 8·4	−22·
W.	−13·6	−16·7	−23·1	n23·2	−21·1	−18·9	−19·0	−16·7	−12·8	− 9·7	− 8·0	− 2·9	− 0·4	4·5	15·4	24·4	x40·8	37·8	32·2	25·3	16·8	7·1	− 4·7	−13·
Eq.	n49·8	−48·5	−40·2	−43·6	−44·0	−32·0	−24·4	−19·1	−12·7	− 8·8	− 4·6	3·1	15·1	25·0	37·1	50·7	64·6	x70·1	65·3	37·0	19·0	0·2	−19·7	−39·
S.	−20·0	−31·7	−42·5	n45·6	−40·0	−30·2	−19·6	−12·9	−13·6	−10·2	−10·4	− 6·7	1·3	12·9	29·7	45·2	x54·0	53·9	45·0	32·4	16·1	7·8	− 0·7	−14·

LX*d*.-LX*f*.—SELECTED DISTURBED DAYS—DIURNAL INEQUALITIES.

Mean Hourly Values, Greenwich Mean Time, for the Months, Year, and Seasons.

Eskdalemuir. LX*d*.—DECLINATION (measured positive towards the West).—*Disturbed Days*. **1919.**

Month and Season.	Hour 1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.
	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′
J.	-3·06	-6·71	-1·69	-0·64	-0·26	-0·08	0·70	1·72	2·14	4·49	4·50	6·45	x6·83	5·89	5·01	2·32	-0·34	2·28	1·37	n̄11·89	-7·69	-3·44	-5·36	-2·54
F.	-2·90	-6·94	-3·78	-2·88	-2·17	1·07	3·61	3·43	3·17	3·51	5·43	5·63	x7·10	6·85	5·56	2·63	-1·46	-6·30	n̄7·54	-7·42	-2·24	-0·76	-2·18	-1·46
M.	-1·82	-4·04	-5·34	-2·71	-0·90	-0·71	0·24	-0·31	0·18	2·70	4·99	7·45	8·87	x9·97	6·33	3·88	0·04	-1·85	n̄9·03	-5·81	-1·48	-7·48	-2·65	-0·52
A.	-2·91	-2·41	-1·52	0·02	-0·88	-1·27	-1·20	-0·25	-0·59	2·48	4·51	7·70	8·49	x9·26	9·01	4·65	1·92	1·39	-2·47	-3·72	n̄9·63	-9·16	-6·82	-6·61
M.	-4·29	-8·50	-4·95	n̄9·77	-0·07	-1·28	-1·94	-0·27	-1·17	1·86	2·72	5·26	6·67	x7·93	6·55	6·37	4·05	2·20	1·94	-0·86	-2·20	-3·63	-3·45	-3·19
J.	-5·16	-5·27	-3·50	-2·35	-5·17	n̄7·40	-7·11	-6·22	-3·63	-0·05	2·73	6·33	8·48	8·61	x8·64	7·29	5·63	3·74	2·41	0·35	-1·07	-1·63	-2·33	-3·31
J.	-3·09	-2·50	-4·82	-2·48	-4·90	-5·68	-5·94	n̄7·79	-5·67	-2·39	0·90	4·75	7·46	x8·96	8·79	7·39	5·73	4·60	2·31	1·47	0·17	-1·67	-3·25	-2·43
A.	-3·30	-1·69	-1·03	-3·92	-7·98	n̄8·29	-3·55	-8·11	-4·82	0·28	2·10	5·60	6·49	x9·10	6·30	6·35	5·20	5·91	2·45	-0·70	-1·90	-3·27	-1·71	0·49
S.	-8·08	n̄10·31	-10·04	-5·35	-3·13	-1·27	0·75	1·47	-0·15	1·65	3·89	6·47	9·10	9·86	x10·81	7·36	6·36	6·10	-2·07	0·33	-3·83	-3·88	-8·58	-7·41
O.	-5·14	-4·40	-3·74	-3·89	-3·71	-2·35	0·82	-2·23	-3·42	-1·49	1·05	4·39	6·17	6·97	8·05	x8·71	6·20	1·53	2·16	0·52	-2·86	-0·86	n̄7·75	-4·73
N.	-2·80	-2·01	-1·26	-1·47	-2·04	-2·20	-1·54	-1·34	-0·82	0·81	1·73	3·57	4·23	7·43	7·61	x8·59	4·91	2·81	-0·39	-4·79	n̄6·55	-5·51	-5·24	-3·75
D.	-2·59	-2·36	-1·99	-1·82	-1·98	-1·35	2·92	3·63	2·10	4·29	3·91	2·94	4·03	3·93	x4·35	3·74	3·79	-2·21	2·10	-1·61	-4·86	n̄7·43	-5·49	-3·85
Y.	-3·76	n̄4·76	-3·64	-3·11	-2·77	-2·57	-1·02	-1·36	-1·06	1·51	3·20	5·54	6·99	x7·90	7·25	5·77	3·50	1·68	-0·91	-2·84	-3·68	-4·06	-4·57	-3·27
W.	-2·84	-4·50	-2·18	-1·70	-1·61	-0·64	1·42	1·86	1·65	3·27	3·89	4·65	5·55	x6·03	5·63	4·32	1·73	0·86	-2·16	n̄6·43	-5·33	-4·29	-4·57	-2·90
Eq.	-4·49	-5·29	-5·16	-2·98	-2·16	-1·40	0·15	-0·33	-1·00	1·33	3·61	6·50	8·16	x9·02	8·55	6·15	3·63	1·79	-2·85	-2·17	-4·45	-5·35	n̄6·45	-4·81
S.	-3·96	-4·49	-3·58	-4·63	-4·53	n̄5·66	-4·64	-5·60	-3·82	-0·08	2·11	5·48	7·28	x8·65	7·57	6·85	5·15	4·11	2·28	0·07	-1·25	-2·55	-2·68	-2·09

Eskdalemuir. LX*e*.—INCLINATION (*Disturbed Days*). **1919.**

	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′
J.	0·07	0·24	0·37	-0·35	-0·81	-0·93	n̄1·21	-0·55	-0·21	-0·44	-0·35	-0·41	-0·66	-0·77	-0·46	0·73	x1·67	0·94	0·42	0·48	1·42	0·42	0·71	-0·36
F.	-0·33	-0·06	0·59	-0·76	-1·05	0·12	-0·67	-0·69	0·39	0·56	0·99	x1·61	0·55	0·39	-0·08	0·53	-0·31	0·08	-0·08	0·16	0·20	-0·38	-0·57	n̄1·20
M.	-0·59	0·01	0·48	-0·25	-1·80	-0·51	-0·60	0·64	0·74	1·42	2·08	x2·89	0·98	0·27	-0·01	0·46	-0·59	-0·13	-0·80	-0·88	-1·02	-1·14	-0·45	n̄1·22
A.	-0·51	-0·47	-0·68	-0·85	-2·33	-0·72	0·62	0·08	1·24	2·20	x2·83	1·72	0·72	0·17	0·17	-0·80	-0·63	-0·49	-0·74	n̄0·90	-0·20	0·56	-0·81	-0·17
M.	-0·07	-0·68	0·20	-0·49	0·67	0·26	2·04	3·13	x3·16	3·14	2·40	1·95	0·69	-0·14	-0·21	-1·92	-3·47	n̄4·06	-2·30	-1·17	-1·54	-0·78	-0·60	-0·21
J.	-0·26	-0·31	0·18	-0·71	-0·50	0·33	1·48	1·95	2·49	x2·50	2·04	1·42	0·32	-0·35	-1·32	-1·33	-1·13	-1·12	n̄1·64	-1·50	-1·51	-0·60	-0·26	-0·19
J.	-0·45	-0·45	-0·72	-0·15	-0·82	-0·26	0·48	0·98	2·08	x2·70	2·50	2·10	1·46	0·69	-0·55	-1·70	-1·65	n̄2·19	-1·54	-0·49	-0·64	-0·62	-0·54	-0·22
A.	-0·82	1·81	-1·27	-0·57	-1·48	-0·68	3·04	4·89	x5·78	4·68	2·55	1·85	1·80	-0·83	n̄4·84	-3·32	-4·81	-1·34	-0·99	-1·71	-1·07	-0·60	-1·07	-1·00
S.	-0·10	-1·63	-1·52	n̄1·95	-1·86	-1·25	-0·26	0·56	1·61	x1·97	1·78	1·70	0·46	-0·21	-0·67	-0·24	-0·54	0·27	0·39	0·17	-0·29	1·04	1·17	-0·57
O.	1·66	x1·80	1·57	1·06	0·55	0·19	1·24	1·22	0·90	0·68	1·09	0·79	0·13	-0·16	-1·77	-3·69	n̄3·94	-0·90	-0·59	-1·81	-1·22	-1·05	0·55	1·64
N.	-0·17	-0·36	-0·71	-0·83	-1·33	n̄1·51	-1·05	-0·59	-0·13	0·10	0·17	0·21	-0·41	-0·17	0·79	0·26	0·77	x1·99	1·41	0·82	0·01	0·47	0·36	-0·12
D.	-0·51	-0·67	-0·89	-1·19	n̄1·66	-1·43	-1·36	-1·27	1·09	x1·95	1·29	1·27	0·27	-0·19	0·85	0·58	0·54	0·41	0·26	0·67	0·12	0·12	0·05	-0·31
Y.	-0·17	-0·06	-0·20	-0·59	-1·03	-0·53	0·31	0·86	1·60	x1·79	1·61	1·43	0·53	-0·11	-0·68	-0·87	n̄1·17	-0·55	-0·52	-0·51	-0·48	-0·22	-0·12	-0·33
W.	-0·23	-0·21	-0·16	-0·78	n̄1·21	-0·94	-1·07	-0·77	0·28	0·55	0·53	0·67	-0·06	-0·18	0·28	0·53	0·67	x0·85	0·50	0·53	0·44	0·16	0·14	-0·50
Eq.	0·11	-0·05	-0·04	-0·50	n̄1·36	-0·57	0·25	0·63	1·12	1·57	x1·94	1·78	0·57	0·02	-0·57	-1·07	-1·42	-0·31	-0·44	-0·86	-0·68	-0·15	0·11	-0·08
S.	-0·40	0·09	-0·40	-0·48	-0·53	-0·09	1·76	2·74	x3·38	3·26	2·37	1·83	1·07	-0·16	-1·73	-2·07	n̄2·77	-2·18	-1·62	-1·22	-1·19	-0·65	-0·62	-0·40

Eskdalemuir. LX*f*.—HORIZONTAL FORCE (*Disturbed Days*). **1919.**

	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
J.	- 6·9	- 9·3	n̄16·3	- 4·2	4·8	8·3	x13·1	3·8	- 0·8	2·3	1·6	3·5	9·8	13·1	10·1	- 2·0	- 8·2	2·9	7·9	2·9	-12·4	- 5·2	-15·7	-3·1
F.	- 0·8	- 7·3	-19·3	0·5	5·4	-10·6	1·6	5·0	- 8·9	- 9·6	-15·0	n̄22·4	- 4·8	- 1·2	8·3	1·3	16·0	9·3	x13·0	6·1	3·0	9·5	8·7	12·2
M.	- 9·6	-16·4	-20·1	- 9·4	13·5	0·6	5·2	-10·3	-10·8	-21·7	-31·0	n̄38·9	- 2·9	11·5	20·5	11·9	x26·0	16·7	23·0	15·4	12·0	10·6	- 2·0	6·2
A.	- 8·2	- 8·1	- 3·1	- 5·6	15·5	- 1·6	-16·4	- 6·9	-22·1	-34·5	n̄42·2	-21·8	- 2·9	6·7	10·1	32·0	x32·9	27·7	29·4	25·2	9·6	- 9·6	2·4	- 8·4
M.	- 5·8	- 4·1	-27·2	-22·0	-39·7	-30·9	-48·6	-57·7	n̄61·4	-52·4	-38·8	-28·9	- 4·9	15·1	24·5	56·6	83·6	x92·3	60·5	37·0	27·9	10·7	10·2	3·9
J.	- 3·6	- 2·1	-11·6	2·5	3·3	- 7·4	-22·6	-29·7	-38·0	n̄39·3	-34·8	-26·3	- 7·8	6·3	24·4	29·1	27·8	26·9	x33·3	29·5	27·8	11·1	3·4	- 1·9
J.	2·8	- 1·5	- 0·4	- 8·6	0·4	- 3·9	-12·4	-18·1	-33·8	n̄43·3	-41·3	-36·0	-24·8	-10·2	10·6	32·6	38·9	x47·7	37·6	19·8	17·7	13·9	10·1	2·1
A.	0·6	-44·7	- 0·1	-10·7	8·3	2·5	-50·4	-77·0	n̄88·8	-74·4	-42·0	-28·1	-24·4	17·5	87·9	72·3	x95·0	43·2	32·0	34·4	21·4	14·7	11·9	- 1·0
S.	-27·8	- 6·3	- 1·1	6·8	5·7	2·5	- 7·3	-16·9	-29·8	n̄32·0	-26·0	-22·8	0·3	17·4	3·7	35·6	x41·0	29·1	25·4	16·3	16·6	-18·6	-27·7	-14·3
O.	-35·0	n̄38·1	-33·1	-26·7	-18·9	-14·8	-32·5	-31·6	-23·1	-18·4	-23·4	-17·9	- 6·0	0·4	24·7	59·4	x80·7	49·2	45·1	48·9	30·5	26·6	- 8·7	-37·3
N.	- 2·6	- 0·2	4·2	5·5	13·0	x15·5	8·9	2·9	- 3·5	- 7·6	- 8·7	- 8·6	2·0	1·1	- 7·5	5·0	10·0	n̄11·5	- 8·0	- 3·1	4·9	- 4·2	- 6·0	- 1·7
D.	4·1	4·8	6·5	10·3	x17·7	14·8	12·1	9·8	-22·7	n̄32·0	-21·0	-17·0	- 3·9	4·7	- 4·6	0·5	2·6	4·4	4·9	0·1	3·2	1·2	- 2·2	2·0
Y.	- 7·7	-11·1	-10·1	- 5·1	2·4	- 2·1	-12·5	-18·9	-28·6	n̄30·2	-26·9	-22·1	- 5·9	6·9	20·2	27·9	x37·2	28·2	25·3	19·4	13·5	5·1	- 1·3	- 3·4
W.	- 1·6	- 3·0	- 6·2	3·0	x10·3	7·0	8·9	5·4	- 9·0	n̄11·7	-10·8	-11·1	0·8	4·4	1·6	1·2	5·1	1·3	4·4	1·5	- 0·3	0·3	- 3·8	2·4
Eq.	-20·2	-17·2	-14·4	- 8·7	4·0	- 3·3	-12·8	-16·4	-21·5	-26·6	n̄30·7	-25·4	- 2·9	9·0	22·3	34·7	x45·2	30·7	30·7	26·5	17·2	2·3	- 9·0	-13·5
S.	- 1·5	-13·1	- 9·8	- 9·7	- 6·9	- 9·9	-33·5	-45·6	n̄55·5	-52·3	-39·2	-29·8	-15·5	7·2	36·9	47·6	x61·3	52·5	40·8	30·2	23·7	12·6	8·9	0·8

x and n̄ mark respectively the mean maximum and minimum hourly values in each month or season.

Note—The corrections formerly applied on account of the effect of the N. Force on the W. Magnetograph, etc., have been ignored this year as insignificant.

LXI*a*.—LXI*b*.—LXII.—DIURNAL INEQUALITIES OF DECLINATION AND HORIZONTAL FORCE.

Derived from readings at exact hours, Greenwich Mean Time.

LXI*a*.—DECLINATION (measured positive towards the West)—*All days except disturbed days.*

Richmond (Kew Observatory). **1919.**

Month and Season.	Hour 1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt
	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′
J.	−1·22	−0·82	−0·27	−0·43	−0·69	−0·26	−0·13	−0·86	−1·20	−0·08	1·72	2·65	x3·22	3·15	2·31	1·66	0·81	0·06	−0·42	−1·20	−1·93	n̄2·32	−2·06	−1·62
F.	−1·24	−0·91	−0·64	−0·82	−1·29	−1·22	−1·09	−0·82	−0·25	1·08	2·47	3·53	x3·67	2·83	1·51	0·55	−0·12	−0·21	−0·33	−0·69	−1·07	−1·64	n̄1·69	−1·58
M.	−2·33	−2·47	−2·23	−2·19	−1·93	−1·37	−1·83	−3·14	n̄3·23	−0·91	2·19	4·77	x6·28	6·22	4·99	2·90	1·61	0·73	−0·30	−0·71	−1·28	−1·80	−2·03	−1·95
A.	−1·29	−1·61	−2·15	−2·07	−1·75	−2·20	−3·37	n̄4·21	−3·34	−1·14	2·23	5·09	6·76	x6·85	5·37	3·58	1·99	0·56	−0·52	−1·20	−1·70	−1·98	−2·06	−1·77
M.	−1·54	−1·85	−2·33	−2·64	−2·67	−3·44	−4·53	n̄4·79	−3·49	−0·86	2·31	5·20	x6·95	6·83	5·56	4·02	2·35	0·94	0·17	−0·53	−1·52	−1·70	−1·23	−1·23
J.	−1·90	−2·10	−2·03	−2·93	−4·39	−5·77	n̄6·35	−5·81	−3·96	−1·17	2·24	5·30	7·11	x7·45	6·45	4·97	3·28	1·69	0·74	0·29	−0·12	−0·47	−0·97	−1·48
J.	−1·58	−1·51	−1·91	−2·54	−3·87	−5·04	−5·68	n̄5·79	−4·44	−1·82	1·30	4·37	6·64	x7·40	6·73	4·85	3·06	1·53	0·69	0·40	0·03	−0·63	−0·86	−1·22
A.	−2·21	−2·32	−2·37	−2·98	−3·43	−4·46	n̄4·90	−4·58	−2·86	−0·04	3·06	6·03	7·26	x7·27	5·59	3·27	1·55	0·70	0·28	−0·06	−0·51	−1·01	−1·33	−1·88
S.	−2·67	−2·39	−2·55	−2·28	−2·03	−2·53	−3·27	n̄3·47	−2·46	0·03	3·44	6·01	x6·91	6·73	5·53	3·61	1·85	0·61	−0·48	−1·08	−1·52	−2·07	−2·87	−3·00
O.	−1·49	−1·32	−1·20	−1·37	−1·40	−1·38	−1·86	n̄3·05	−3·00	−0·69	2·36	4·53	x5·56	5·19	3·77	2·08	1·37	1·03	0·09	−0·84	−1·63	−2·46	−2·38	−1·95
N.	−1·01	−0·71	−0·69	−0·55	−0·82	−1·12	−1·31	−1·38	−1·32	0·06	2·31	3·12	x3·28	2·75	2·03	1·20	0·61	0·40	−0·24	−0·97	n̄1·57	−1·37	−1·34	−1·36
D.	−1·55	−0·71	−0·06	−0·14	−0·21	−0·16	0·14	−0·22	−0·55	0·15	1·55	2·09	x2·90	2·85	2·28	1·41	1·10	0·12	−0·49	−0·92	−1·91	−2·46	n̄2·83	−2·35
Y.	−1·67	−1·56	−1·54	−1·75	−2·04	−2·41	−2·85	n̄3·18	−2·51	−0·45	2·26	4·39	x5·55	5·46	4·34	2·84	1·62	0·68	−0·07	−0·63	−1·23	−1·66	−1·80	−1·78
W.	−1·26	−0·79	−0·42	−0·49	−0·75	−0·69	−0·60	−0·82	−0·83	0·30	2·01	2·85	x3·27	2·89	2·03	1·20	0·60	0·09	−0·37	−0·95	−1·62	−1·95	n̄1·98	−1·73
Eq.	−1·94	−1·95	−2·03	−1·98	−1·78	−1·87	−2·58	n̄3·47	−3·01	−0·68	2·56	5·10	x6·38	6·25	4·91	3·04	1·70	0·73	−0·30	−0·96	−1·53	−2·08	−2·34	−2·17
S.	−1·81	−1·95	−2·16	−2·77	−3·59	−4·68	n̄5·37	−5·24	−3·69	−0·97	2·23	5·22	6·99	x7·24	6·08	4·28	2·56	1·21	0·47	0·02	−0·53	−0·95	−1·10	−1·45

LXI*b*.—DECLINATION (*Quiet days*).

Richmond (Kew Observatory). **1919.**

	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′
J.	−0·14	−0·08	−0·01	−0·48	−0·62	−0·73	−0·98	−1·56	n̄1·73	−0·60	1·18	2·41	x3·04	2·96	1·55	0·64	0·42	0·11	−0·26	−0·52	−0·81	−1·17	−1·40	−1·27
F.	−0·29	−0·08	−0·12	−0·49	−1·06	−1·25	−1·49	n̄1·86	−1·65	−0·30	1·56	2·71	x3·56	2·78	1·29	0·26	0·23	0·05	−0·36	−0·75	−0·64	−0·78	−0·71	−0·66
M.	−0·77	−0·87	−0·85	−1·19	−1·19	−1·37	−2·34	−3·44	n̄3·75	−1·80	1·60	3·59	4·58	x4·72	3·57	2·26	1·20	0·15	−1·29	0·79	0·03	−0·21	−0·78	−0·99
A.	−0·76	−0·75	−1·03	−1·46	−1·70	−2·31	−3·69	n̄4·88	−4·20	−2·35	0·45	3·36	5·47	x5·75	4·54	2·84	1·39	0·47	0·10	0·28	0·15	−0·33	−0·58	−0·68
M.	−0·41	−0·59	−0·95	−1·54	−2·70	−4·18	−5·12	n̄5·14	−3·60	−1·37	0·85	3·55	x5·41	5·21	4·16	2·72	1·90	1·10	0·58	0·46	0·19	0·15	−0·15	−0·55
J.	−0·37	−0·65	−0·79	−2·13	−3·61	−5·31	n̄6·16	−5·74	−4·10	−1·62	1·50	4·58	6·10	x6·28	5·30	3·68	2·28	1·05	0·59	0·17	−0·07	−0·23	−0·33	−0·43
J.	−0·65	−0·98	−1·02	−1·85	−2·75	−4·30	−5·58	n̄6·27	−5·05	−2·32	0·64	3·71	6·30	x7·12	6·27	4·41	2·54	0·76	−0·11	−0·05	0·00	−0·20	−0·25	−0·47
A.	−1·43	−1·41	−1·92	−2·40	−2·87	−4·07	n̄4·10	−3·65	−2·25	0·06	3·56	6·43	x7·46	6·24	4·09	1·73	0·32	−0·17	−0·47	−0·76	−0·92	−1·07	−0·87	−1·42
S.	−2·13	−1·83	−2·19	−2·19	−2·41	−2·98	−3·92	n̄4·40	−3·38	−1·14	2·20	4·94	x5·96	5·72	4·74	2·96	1·64	1·12	0·69	0·33	0·23	−0·31	−1·51	−2·17
O.	−1·15	−0·89	−0·93	−0·83	−0·85	−1·51	−2·59	−4·17	n̄4·29	−2·11	1·33	4·45	x5·55	5·39	3·67	2·39	1·65	1·27	0·61	−0·13	−1·35	−1·97	−1·87	−1·67
N.	−0·81	−0·44	−0·34	−0·29	−0·76	−0·95	−1·44	n̄1·77	−1·57	−0·32	2·05	x2·92	2·81	1·96	1·09	0·79	0·30	0·09	−0·18	−0·51	−0·48	−0·58	−0·73	−0·82
D.	−0·36	−0·22	−0·17	−0·15	−0·27	−0·27	−0·33	−0·89	−1·02	−0·14	1·20	1·70	x2·16	1·96	1·54	0·95	0·55	0·35	−0·15	−0·93	−1·33	−1·48	n̄1·60	−1·20
Y.	−0·77	−0·73	−0·86	−1·25	−1·73	−2·44	−3·14	n̄3·65	−3·05	−1·17	1·51	3·70	x4·87	4·67	3·48	2·14	1·20	0·53	−0·02	−0·27	−0·42	−0·68	−0·90	−1·03
W.	−0·40	−0·20	−0·16	−0·35	−0·68	−0·80	−1·06	n̄1·52	−1·49	−0·34	1·50	2·44	x2·89	2·42	1·37	0·66	0·38	0·15	−0·24	−0·68	−0·81	−1·00	−1·11	−0·99
Eq.	−1·20	−1·09	−1·25	−1·42	−1·54	−2·04	−3·14	n̄4·22	−3·91	−1·85	1·40	4·08	5·39	x5·40	4·13	2·61	1·47	0·75	0·03	−0·08	−0·24	−0·71	−1·19	−1·38
S.	−0·72	−0·91	−1·17	−1·98	−2·98	−4·46	n̄5·24	−5·20	−3·75	−1·31	1·64	4·57	x6·32	6·21	4·96	3·13	1·76	0·68	0·15	−0·04	−0·20	−0·34	−0·40	−0·72

LXII.—HORIZONTAL FORCE (*Quiet days*).

Richmond (Kew Observatory). **1919.**

	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
J.	− 1·2	− 1·7	0·6	1·0	2·3	3·0	7·8	x 8·4	1·1	− 6·7	−11·7	n̄12·8	− 8·8	− 1·7	0·1	0·6	3·3	6·5	6·5	4·6	3·5	1·1	− 1·7	− 3·7
F.	− 3·5	− 2·7	1·7	2·0	3·8	4·1	3·9	3·2	− 0·5	− 7·2	n̄10·0	− 8·7	− 4·5	− 1·4	0·1	− 0·3	− 1·8	0·8	4·5	6·1	x 6·8	4·4	1·6	− 2·1
M.	0·8	1·9	4·6	3·7	5·5	7·4	6·6	7·1	− 0·1	−15·8	n̄23·0	−19·5	−11·4	− 6·9	− 1·4	0·5	0·1	4·2	7·3	4·9	6·4	x 7·9	6·9	1·9
A.	3·2	0·6	0·5	1·2	4·4	6·1	6·2	1·9	− 6·9	−17·5	n̄21·4	−20·0	−14·7	−10·0	− 4·6	0·2	7·8	x13·0	11·0	11·0	10·4	8·6	4·6	4·1
M.	− 0·6	− 1·3	− 1·5	− 0·1	3·3	0·6	− 1·5	− 5·0	− 7·8	− 8·7	−11·6	−10·7	n̄12·0	−11·9	− 3·4	2·2	9·3	12·4	x13·4	13·3	8·4	7·1	4·8	1·1
J.	3·1	2·7	4·2	4·3	4·3	3·0	− 1·7	−11·6	−19·5	n̄21·8	−20·8	−17·5	−13·2	− 7·8	− 2·2	4·8	9·6	11·6	15·1	x15·9	14·7	12·3	7·3	3·4
J.	3·0	2·6	1·3	3·1	4·2	3·6	0·1	− 6·5	−18·8	n̄27·7	−27·3	−23·5	−13·6	− 5·1	2·5	9·4	12·7	12·8	13·2	x14·6	12·9	11·0	8·6	6·4
A.	2·1	1·1	− 0·4	0·4	0·5	− 1·9	− 6·3	−12·9	−18·8	n̄21·1	−18·6	− 9·7	− 1·4	0·4	3·1	7·5	10·0	11·7	13·4	x13·8	11·5	7·7	5·2	3·2
S.	2·8	1·4	1·2	4·2	5·0	5·9	1·8	− 6·3	−18·7	n̄25·8	−24·0	−19·8	−13·0	− 7·9	− 3·4	2·5	8·1	11·6	x15·8	15·7	14·5	12·6	9·7	5·7
O.	3·2	0·6	0·4	2·3	6·5	9·6	8·6	− 0·1	−11·2	−22·8	n̄24·0	−19·5	−14·3	− 6·3	− 1·6	2·2	4·3	7·1	9·2	10·6	x12·4	10·0	7·7	5·0
N.	− 4·1	− 4·2	− 2·0	− 0·4	2·5	5·5	5·8	2·7	− 5·6	n̄13·5	n̄13·5	−11·4	− 7·8	− 3·0	1·0	4·3	7·0	x 8·3	7·6	5·4	6·7	4·6	3·7	0·7
D.	− 3·5	− 3·8	− 2·0	− 0·7	2·5	3·1	5·4	x 6·1	− 0·1	− 8·2	n̄ 8·3	− 7·5	− 3·2	− 2·5	− 0·9	1·2	4·6	5·7	5·0	3·5	0·9	1·1	1·9	0·0
Y.	0·4	− 0·2	0·7	1·8	3·7	4·2	3·1	− 1·1	− 8·9	−16·4	n̄17·8	−15·0	− 9·8	− 5·3	− 0·9	2·9	6·3	8·8	x10·2	10·0	9·1	7·4	5·0	2·1
W.	− 3·1	− 3·1	− 0·4	0·5	2·8	3·9	5·7	5·1	− 1·3	− 8·9	n̄10·9	−10·1	− 6·1	− 2·2	0·1	1·5	3·3	5·3	x 5·9	4·9	4·5	2·8	1·4	− 1·3
Eq.	2·5	1·1	1·7	2·9	5·4	7·3	5·8	0·7	− 9·2	−20·5	n̄23·1	−19·7	−13·4	− 7·8	− 2·8	1·4	5·1	9·0	10·8	10·5	x10·9	9·8	7·2	4·2
S.	1·9	1·3	0·9	1·9	3·1	1·3	− 2·4	− 9·0	−16·2	n̄19·8	−19·6	−15·4	−10·0	− 6·1	0·0	6·0	10·4	12·1	13·8	n̄14·4	11·9	9·5	6·5	3·5

x and n̄ mark respectively the mean maximum and minimum hourly values in each month or season.

LXIII.—RANGE OF MEAN DIURNAL INEQUALITIES FOR THE MONTHS, YEAR, AND SEASONS OF 1919, AT ESKDALEMUIR AND RICHMOND (KEW OBSERVATORY).

Note.—The ranges are those shown in Tables XLIX. to LXII., in the preparation of which non-cyclic change has been eliminated (see Table LXIIIa).

Month and Season.	ESKDALEMUIR.																		RICHMOND.		
	"All" Days.			Quiet Days.			Disturbed Days.			"All" Days.			Quiet Days.			Disturbed Days.			"All" Days.	Quiet Days.	
	N.	W.	V.	N.	W.	V.	N.	W.	V.	D.	I.	H.	D.	I.	H.	D.	I.	H.	D.	D.	H.
	γ	γ	γ	γ	γ	γ	γ	γ	γ	′	′	γ	′	′	γ	′	′	γ	′	′	γ
J.	20·6	35·9	26·4	22·7	21·5	5·0	32·8	88·9	74·6	7·97	1·29	17·5	4·87	1·28	18·7	18·72	2·89	29·3	5·54	4·77	21·2
F.	30·6	33·7	26·1	23·8	24·2	6·4	52·5	65·9	60·0	7·53	1·33	21·9	5·73	1·19	19·7	14·63	2·81	35·4	5·36	5·42	16·8
M.	45·7	43·3	41·7	35·0	40·2	18·6	82·6	84·8	104·7	9·58	2·36	39·5	8·59	2·11	35·6	19·00	4·11	64·9	9·51	8·47	30·9
A.	55·7	53·7	32·5	51·4	48·4	22·4	78·4	90·3	115·1	11·55	3·01	56·2	11·13	2·93	50·8	18·90	3·73	75·1	11·06	10·63	34·4
M.	67·8	57·5	48·1	40·8	50·5	23·7	142·3	97·9	165·1	11·74	3·78	71·6	11·22	2·31	43·0	17·71	7·22	153·7	11·74	10·55	25·4
J.	60·3	70·2	30·4	50·6	61·0	24·8	65·9	87·3	53·6	14·28	3·75	64·5	13·00	2·90	50·8	16·04	4·15	72·6	13·80	12·44	37·7
J.	60·2	69·2	28·1	49·9	67·7	19·3	80·3	85·8	72·5	13·83	3·77	64·8	14·03	3·24	52·9	16·75	4·89	91·0	13·19	13·39	42·3
A.	50·0	64·2	25·1	48·4	54·6	24·7	161·5	114·9	114·9	13·42	3·17	53·0	11·88	2·88	47·3	17·39	10·63	183·7	12·17	11·56	34·9
S.	48·0	56·1	48·5	52·2	47·0	15·3	63·2	109·7	172·1	12·43	2·78	47·4	10·66	3·26	52·2	21·12	3·93	73·0	10·38	10·36	41·6
O.	41·8	41·0	38·1	42·2	46·0	12·8	100·7	96·3	135·7	9·41	2·37	38·5	9·61	2·53	40·5	16·46	5·83	118·8	8·61	9·84	36·4
N.	25·1	27·1	20·7	21·8	20·4	4·3	32·9	70·4	77·0	6·13	1·44	20·9	4·44	1·32	20·2	15·14	3·50	27·0	4·85	4·69	21·8
D.	21·1	31·2	15·4	14·2	19·6	6·1	56·5	53·8	53·3	6·73	1·36	18·8	4·25	0·84	12·1	11·78	3·61	49·8	5·73	3·76	14·4
Y.	40·6	42·9	28·7	35·4	40·0	13·8	61·7	65·0	91·4	8·93	2·04	39·3	8·66	2·05	34·8	12·66	2·96	67·4	8·73	8·52	28·0
W.	22·2	29·9	21·6	19·9	20·2	3·8	29·3	58·7	63·9	6·77	1·26	17·0	4·57	1·07	16·0	12·45	2·06	21·9	5·25	4·41	16·8
Eq.	45·7	47·9	38·2	43·2	45·2	15·7	72·5	78·8	119·9	10·22	2·55	44·2	9·70	2·56	42·2	15·46	3·30	75·8	9·85	9·62	34·0
S.	58·2	64·6	31·1	46·5	57·5	22·8	101·3	85·4	99·6	13·12	3·53	62·3	12·07	2·77	47·4	14·25	6·15	116·8	12·61	11·56	34·2

LXIII*a*.—NON-CYCLIC CHANGE (24h—0h) FOR THE MONTHS OF 1919 AT TWO OBSERVATORIES.

Month.	ESKDALEMUIR.									RICHMOND.		
	"All" Days.			Quiet Days.			Disturbed Days.			"All" Days	Quiet Days.	
	N.	W.	V.	N.	W.	V.	N.	W.	V.	D.	D.	H.
	γ	γ	γ	γ	γ	γ	γ	γ	γ	′	′	γ
January	0·1	− 2·0	− 1·1	2·6	1·8	− 2·2	− 1·4	− 14·8	− 8·6	− 0·05	0·32	3·2
February	0·4	3·6	− 2·5	5·4	3·0	0·0	− 6·6	10·8	− 14·0	0·00	0·30	5·6
March	0·9	− 0·8	1·7	4·4	1·2	− 1·0	0·0	− 2·8	18·3	− 0·90	0·16	5·2
April	1·6	− 0·2	3·9	3·4	1·0	0·8	− 13·2	19·4	15·0	0·12	0·12	5·0
May	0·1	− 0·1	0·6	8·4	1·2	1·2	− 32·2	− 17·4	− 19·0	0·05	0·04	8·4
June	− 0·2	− 0·3	0·4	6·8	1·8	− 0·8	− 4·6	2·8	− 1·0	− 0·04	− 0·02	6·5
July	− 0·1	− 0·1	0·1	3·6	0·6	2·4	− 9·8	− 2·6	− 0·2	− 0·02	0·12	4·4
August	2·8	− 2·1	6·6	7·4	5·0	2·6	− 17·6	− 6·4	10·4	− 0·08	0·14	10·4
September	1·0	0·3	− 0·9	4·0	3·0	− 4·0	− 23·2	− 17·6	− 49·0	− 0·21	− 0·98	4·9
October	0·8	− 0·4	− 1·0	2·4	0·0	− 1·8	− 76·6	− 51·2	− 29·4	− 0·18	0·00	2·0
November	0·2	− 0·3	− 1·0	2·6	0·0	− 2·2	− 13·8	− 8·8	− 0·8	0·00	− 0·20	2·4
December	0·6	− 0·6	− 0·9	4·0	6·8	− 4·2	− 8·4	− 10·8	− 5·0	0·01	0·44	6·5

LXIII*b*.—MEAN VALUES OF THE SQUARES OF THE ABSOLUTE DAILY RANGES OF THE GEOGRAPHICAL COMPONENTS OF TERRESTRIAL MAGNETIC FORCE.*

Eskdalemuir. (Unit $1\gamma^2$). **1919.**

Month and Year.	R_N^2	R_W^2	R_V^2	$R_N^2 + R_W^2$	$R_N^2 + R_W^2 + R_V^2$	Mean Character Figure.
January	13988	15192	8198	29180	37378	0·77
February	12178	13556	6774	26078	33094	0·79
March	18566	16781	10084	35347	39521	1·03
April	13343	11611	7742	24504	32247	0·80
May	21707	14785	13957	36492	50449	0·90
June	8743	9608	2493	18351	20844	0·57
July	10160	9368	3135	19659	22887	0·55
August	27184	16621	13339	43805	57144	0·65
September	23309	18256	21155	42702	64608	0·83
October	34800	26771	17238	61571	78809	0·97
November	4414	6803	4117	11216	15333	0·37
December	6457	5996	1914	12453	14367	0·58
Year 1919	16237	13779	9179	30113	38890	0·73
Year 1918	15101	12958	7479	27757	35282	0·68
Year 1917	14535	12058	7842	26593	34435	0·65
Year 1916	12508	10172	8269	22680	30949	0·74
Year 1915	10066	9542	3808	19608	23416	0·86
Year 1914	4606	4333	1632	8939	10571	0·71
Year 1913	3097	3320	—	6417	—	0·58
Year 1912	3591	3402	—	6993	—	0·69
Year 1911	7655	6103	2514	13758	16272	0·85

* See footnote on page 65.

LXIV.—HARMONIC COMPONENTS OF THE DIURNAL INEQUALITY.*

Values of a_n, b_n in the series $\Sigma\ (a_n \cos 15nt^\circ + b_n \sin 15nt^\circ)$, t being reckoned in hours from midnight G.M.T.

Eskdalemuir. (Longitude of Eskdalemuir Observatory, 3° 12′ W.) **1919.**

Month and Seasons.	North Component.								West Component.								Vertical Component.							
	a_1.	b_1.	a_2.	b_2.	a_3.	b_3.	a_4.	b_4.	a_1.	b_1.	a_2.	b_2.	a_3.	b_3.	a_4.	b_4.	a_1.	b_1.	a_2.	b_2.	a_3.	b_3.	a_4.	b_4.
	All Days.																							
	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
J.	6·1	1·4	− 4·7	−1·6	1·9	1·3	−0·1	1·4	−12·9	− 1·5	0·0	6·1	0·9	−0·5	2·3	1·4	−1·0	−11·8	− 3·8	−1·9	−0·8	0·5	−0·4	0·0
F.	8·9	− 2·2	− 6·1	−1·9	1·6	−1·6	0·0	0·3	−12·9	− 2·3	3·8	2·3	−0·9	−3·0	−0·6	1·5	−1·4	−11·6	− 3·0	−1·8	0·5	−0·4	−0·5	−0·3
M.	14·4	− 3·1	−10·2	−0·6	4·1	−2·4	−0·5	0·2	−11·5	− 9·5	2·8	8·8	−0·7	−6·1	1·7	2·0	−5·0	−15·3	− 8·0	−3·3	1·9	−0·2	−0·8	−0·7
A.	18·1	− 4·4	−12·9	−1·0	3·9	0·0	−0·5	2·1	−11·0	−15·8	1·8	11·5	−1·0	−3·8	1·6	2·1	0·6	−13·3	− 7·6	−2·4	1·0	1·6	−0·5	0·2
M.	18·0	−14·9	−14·4	2·3	1·8	2·8	0·1	1·2	−10·0	−22·7	1·4	9·5	−1·5	−3·0	2·5	1·1	−0·2	−20·2	− 8·2	−1·1	2·9	2·6	−0·2	0·8
J.	19·0	−10·5	−13·2	1·1	−0·3	−2·0	0·0	0·3	− 7·1	−28·2	4·6	11·1	−3·6	−3·0	−0·5	−0·3	5·3	− 6·8	− 7·7	−2·0	1·9	−0·1	−0·7	−0·3
J.	20·5	− 7·3	−13·7	1·6	3·8	−1·3	0·2	0·2	− 5·1	−26·2	2·3	12·3	−2·2	−4·0	−0·3	0·5	4·6	− 7·6	− 6·4	−3·4	1·4	1·0	0·3	−0·2
A.	17·1	− 6·0	−11·7	1·5	2·1	−4·0	0·7	0·8	−10·2	−21·7	6·6	9·5	−3·9	−4·2	−0·2	1·2	0·9	− 7·3	− 6·7	−2·0	2·7	0·3	−0·3	−0·7
S.	15·8	− 4·1	−12·3	4·4	1·1	−2·0	−0·7	1·1	−18·2	−14·5	0·3	9·8	−2·8	−5·3	1·4	1·2	−5·6	−17·6	−11·2	−2·7	0·3	1·3	−0·8	−0·2
O.	14·6	− 2·8	− 8·8	−0·8	3·6	−1·4	−1·2	−0·7	−10·9	−10·4	−0·3	9·3	−1·2	−2·9	2·5	2·4	−3·8	−14·2	− 1·3	−0·9	0·8	2·0	0·9	1·6
N.	7·1	2·6	− 5·5	−0·3	1·4	−1·9	−0·5	0·6	− 8·8	− 4·0	0·5	6·4	−0·3	−1·3	1·6	0·3	0·5	− 8·3	− 2·9	−0·3	1·0	1·0	−0·1	−0·4
D.	5·5	2·5	− 4·7	−0·7	1·6	2·2	1·3	0·6	−10·5	− 0·9	−2·2	5·1	−0·4	−0·7	0·0	1·6	0·1	− 8·1	− 1·4	−0·8	0·0	−0·4	−0·3	−0·7
Y.	13·8	− 4·1	− 9·9	0·3	2·3	−1·4	−0·1	0·6	−10·8	−13·1	1·8	8·5	−1·4	−3·2	0·9	1·3	−0·2	−11·8	− 5·9	−2·0	1·1	0·8	−0·3	0·2
W.	6·9	1·1	− 5·3	−1·1	1·6	−1·8	0·2	0·7	−11·3	− 2·2	0·5	5·0	−0·2	−1·4	0·8	1·2	−0·5	−10·0	− 2·8	−1·2	0·2	0·2	−0·3	−0·4
Eq.	15·7	− 3·6	−11·1	0·5	3·2	−1·4	−0·7	0·6	−12·9	−12·5	1·2	9·9	−1·4	−4·5	1·8	1·9	−2·9	−15·1	− 7·4	−2·7	1·1	1·2	0·0	−0·1
S.	18·7	− 9·7	−13·3	1·6	1·9	−1·1	0·3	0·6	− 8·1	−24·7	3·7	10·6	−2·8	−3·6	0·4	0·6	2·7	−10·5	− 7·2	−2·1	2·2	0·9	−0·2	−0·1
	Quiet Days.																							
Y.	13·0	− 1·2	− 8·8	−0·7	2·6	1·3	−0·4	0·8	− 3·9	−12·0	3·1	7·6	−2·6	−3·2	0·6	1·4	3·5	− 1·6	−3·3	−0·5	1·5	0·4	−0·7	−0·3
W.	5·5	0·7	− 5·5	−0·6	1·9	−1·3	−0·5	0·3	− 4·4	− 4·1	1·4	3·8	−1·9	−1·4	0·8	1·3	0·7	− 1·5	−0·3	−0·3	0·6	0·0	−0·4	−0·2
Eq.	16·3	− 0·3	−10·2	−1·6	3·8	−1·5	−0·7	1·4	− 4·0	−12·7	2·1	8·5	−2·7	−4·8	1·1	2·1	3·7	− 1·4	−4·0	−0·9	2·1	0·6	−1·1	−0·4
S.	17·1	− 4·0	−10·7	0·1	2·0	−1·0	0·1	0·8	− 3·4	−19·3	5·8	10·5	−3·2	−3·4	0·0	0·8	6·2	− 1·7	−5·7	−0·2	2·1	0·5	−0·7	−0·3
	Disturbed Days.																							
Y.	12·4	−16·5	−13·6	3·9	1·3	−2·7	0·7	−1·1	−21·1	−16·5	−1·2	11·0	1·4	−3·6	1·7	0·0	−10·3	−37·1	−12·0	−3·5	1·8	3·5	1·0	0·1
W.	8·7	− 0·3	− 6·1	−0·4	0·2	−3·6	1·4	2·2	−22·3	0·0	1·0	7·5	4·5	−2·8	1·3	−0·1	− 3·0	−26·2	− 8·3	−2·0	0·1	3·2	1·0	−0·7
Eq.	10·0	−19·6	−17·5	2·0	0·8	−2·1	−1·7	−1·5	−27·1	−16·1	−4·2	11·6	1·1	−5·7	1·2	1·3	−19·3	−46·3	−17·3	−3·9	−1·3	4·0	0·3	0·4
S.	18·5	−29·5	−17·5	10·2	2·9	−2·5	2·5	−3·8	−14·0	−33·3	−0·5	13·8	−1·3	−2·3	2·7	−1·2	− 8·5	−38·9	−10·4	−4·7	6·7	3·3	1·6	0·5

LXIV*a*.—HARMONIC COMPONENTS OF THE DIURNAL INEQUALITY.*

Values of c_n, α_n in the series $\Sigma c_n \sin (15nt^\circ + \alpha_n)$, t being Mean Local Time reckoned in hours from midnight.

Eskdalemuir. (Longitude of Eskdalemuir Observatory, 3° 12′ W.) **1919.**

Month and Seasons.	North Component.								West Component.								Vertical Component.							
	c_1.	α_1.	c_2.	α_2.	c_3.	α_3.	c_4.	α_4.	c_1.	α_1.	c_2.	α_2.	c_3.	α_3.	c_4.	α_4.	c_1.	α_1.	c_2.	α_2.	c_3.	α_3.	c_4.	α_4.
	All Days.																							
	γ	°	γ	°	γ	°	γ	°	γ	°	γ	°	γ	°	γ	°	γ	°	γ	°	γ	°	γ	°
J.	6·2	76·8	5·1	250·9	2·4	126·4	1·4	355·2	13·0	263·2	6·1	359·9	1·0	121·0	2·6	59·7	11·9	184·8	4·3	243·7	1·0	122·9	0·4	265·2
F.	9·2	103·5	6·4	252·2	2·3	134·0	0·3	359·3	13·1	260·0	4·4	59·1	3·1	197·9	1·6	335·9	11·7	186·9	3·5	239·4	0·6	130·2	0·6	239·1
M.	14·7	102·1	10·2	266·4	4·8	119·9	0·6	294·1	14·9	230·4	9·2	18·1	6·1	186·6	2·6	39·2	16·1	198·1	8·7	247·4	1·9	95·0	1·2	226·5
A.	18·6	103·8	13·0	265·8	3·9	90·0	2·2	347·4	19·2	214·9	11·7	9·1	3·9	195·0	2·6	37·0	13·3	177·3	8·0	252·6	2·0	33·0	0·6	286·5
M.	23·4	129·5	14·6	279·1	3·3	31·8	1·2	7·6	24·8	203·9	9·6	8·8	3·3	207·0	2·7	67·1	20·2	180·6	8·3	262·3	3·8	48·2	0·8	345·8
J.	21·7	118·8	13·3	274·8	2·0	189·3	0·3	1·5	29·1	194·1	12·0	22·9	4·7	230·1	0·5	238·7	8·6	142·4	7·9	255·6	1·9	94·0	0·7	249·1
J.	21·7	109·7	13·8	276·5	4·0	109·8	0·3	43·5	26·7	191·1	12·6	10·4	4·5	208·0	0·6	331·8	8·9	149·0	7·3	241·7	1·8	53·6	0·3	124·1
A.	18·1	109·2	11·8	277·3	4·5	152·8	1·2	42·2	24·0	205·2	11·5	34·5	5·8	222·7	1·3	352·5	7·3	172·9	7·0	252·9	2·7	83·1	0·7	203·9
S.	16·3	104·5	13·1	289·8	2·3	149·2	1·3	325·1	23·2	231·4	9·8	1·8	5·9	207·8	1·8	49·0	18·5	197·6	11·6	256·3	1·3	11·9	0·8	254·2
O.	14·9	101·0	8·9	264·5	3·9	111·1	1·4	240·3	15·1	226·2	9·4	357·8	3·2	202·6	3·5	45·7	14·7	194·9	1·6	237·2	2·2	22·1	1·8	32·7
N.	7·6	70·1	5·5	266·5	2·4	141·4	0·8	317·5	9·7	245·5	6·5	4·1	1·3	193·4	1·7	80·4	8·3	176·7	11·3	263·4	1·4	45·9	0·4	198·0
D.	6·0	66·0	4·7	262·0	2·8	142·7	1·5	63·5	10·5	265·2	5·6	336·0	0·9	210·7	1·6	179·4	8·1	179·1	1·6	241·5	0·4	174·6	0·8	201·0
Y.	14·4	106·5	9·9	271·9	2·7	122·8	0·7	351·7	17·0	219·3	8·7	12·0	3·5	205·0	1·6	38·6	11·8	181·2	6·2	250·9	1·4	55·6	0·4	298·6
W.	7·0	81·2	5·4	257·7	2·5	136·5	0·7	11·3	11·5	259·0	4·9	5·8	1·4	188·4	1·4	35·0	10·0	182·6	3·0	246·8	0·3	45·7	0·5	222·2
Eq.	16·1	102·9	11·1	272·6	3·5	114·0	0·9	312·6	18·0	225·7	9·9	6·7	4·7	197·5	2·6	42·5	15·8	190·6	7·9	249·9	1·6	41·3	0·1	165·0
S.	21·0	117·4	13·4	276·9	2·2	122·0	0·7	24·2	26·0	198·2	11·2	19·4	4·5	218·1	0·7	32·4	10·8	165·9	7·6	253·5	2·4	66·6	0·2	251·0
	Quiet Days.																							
Y.	13·0	95·2	8·8	265·1	2·9	117·0	0·9	334·3	12·7	198·2	8·3	22·2	4·1	218·6	1·6	25·3	3·9	113·8	3·3	261·5	1·6	75·9	0·8	247·1
W.	5·6	82·4	5·5	263·1	2·3	124·2	0·6	300·4	6·1	227·2	4·1	20·1	2·4	232·4	1·5	35·5	1·6	156·2	0·4	223·3	0·6	88·2	0·5	245·4
Eq.	16·3	91·1	10·4	266·7	4·1	112·4	1·6	330·4	13·3	197·6	8·8	14·3	5·6	208·6	2·3	27·5	4·0	110·9	4·1	256·7	2·2	72·6	1·2	247·0
S.	17·6	103·1	10·7	270·7	2·3	118·0	0·8	7·0	19·7	189·9	12·0	28·9	4·6	223·3	0·8	1·3	6·4	105·7	5·7	267·7	2·1	75·7	0·8	248·4
	Disturbed Days.																							
Y.	20·6	143·0	14·2	286·2	3·0	153·9	1·3	144·3	26·8	232·1	11·0	353·6	3·8	158·1	1·7	91·2	38·7	196·1	12·5	253·6	4·1	28·0	1·0	53·0
W.	8·7	91·7	6·2	266·4	3·7	176·6	2·6	32·5	22·3	270·1	7·5	7·0	5·4	121·8	1·3	96·5	26·4	186·5	8·6	256·4	3·3	2·5	1·3	124·9
Eq.	22·0	152·9	17·6	276·7	2·2	158·8	2·3	228·2	31·5	239·3	12·4	340·1	5·8	169·1	1·7	42·0	50·1	202·7	17·9	257·2	4·1	7·6	0·5	33·4
S.	34·9	32·0	20·2	300·4	3·9	129·5	4·6	146·3	36·2	202·4	13·9	357·9	2·6	210·3	2·9	113·9	39·8	192·4	11·5	245·7	7·7	63·7	1·8	71·9

* See Notes on the Management of Instruments, page 63.

LXVII.—MEAN MONTHLY AND ANNUAL VALUES OF TERRESTRIAL MAGNETIC ELEMENTS AT THE METEOROLOGICAL OFFICE OBSERVATORIES, 1919.

1919.	RICHMOND (KEW OBS.) (quiet days **D** and **H**, absolute observations **I**, See p. 58).				ESKDALEMUIR. (all days except those noted in monthly tables).				CAHIRCIVEEN (VALENCIA OBS.) (in general 2 absolute observations per month).			
	North.	West.	Vertical.	Total.	North.	West.	Vertical.	Total.	North.	West.	Vertical.	Total.
	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
January	17814	4691	43313	47068	15962	4897	45095	48087	16817	5972	44439	47888
February	17810	4687	43286	47041	15967	4893	45079	48073	16811	5971	44390	47842
March	17805	4680	43266	47020	15966	4890	45053	48048	16809	5954	44436	47881
April	17824	4682	43349	47104	15980	4888	45063	48062	16833	5948	44430	47883
May	17818	4673	43299	47055	15988	4886	45078	48078	16834	5933	44375	47830
June	17824	4672	43304	47061	16005	4887	45099	48104	16811	5927	44323	47774
July	17824	4667	43291	47049	16009	4887	45117	48122	16825	5926	44363	47814
August	17794	4659	43257	47005	15996	4876	45118	48117	16819	5942	44353	47806
September	17810	4657	43341	47088	15988	4870	45091	48089	16822	5932	44339	47792
October	17814	4652	43339	47087	15982	4865	45072	48069	16805	5936	44349	47797
November	17820	4647	43291	47045	15990	4864	45067	48066	16842	5929	44419	47873
December	17821	4643	43319	47071	15987	4862	45070	48068	16847	5933	44407	47864
Year 1919	17815	4667	43305	47058	15985	4880	45084	48082	16823	5942	44385	47837
Year 1918	17814	4720	43361	47115	15973	4925	44067	48067	16810	5987	44407	47858
Year 1917	17809	4770	43366	47122	15976	4971	45093	48097	16808	6024	44448	47900
Year 1916	17816	4823	43395	47156	15986	5020	45119	48130	16803	6078	44473	47929
Year 1915	17808	4874	43376	47141	16001	5075	45173	48191	16785	6130	44519*	47972*
Year 1910	17781	5117	43546	47313	15976	5311	45343	49368	16732	6337	44771	48215
Year 1905	17743	5272	43742	47496	..	..	..	..	..	..	..	..

1919.	Declination (West).	Inclination (North).	Horizontal Force.	Declination (West).	Inclination (North).	Horizontal Force.	Declination (West).	Inclination (North).	Horizontal Force.
	° ′	° ′	γ	° ′	° ′	γ	° ′	° ′	γ
January	14 45·1	66 57·6	18421	17 3·3	69 41·0	16696	19 32·9	68 7·2	17846
February	14 44·7	66 57·1	18417	17 2·2	69 40·3	16700	19 33·2	68 6·4	17840
March	14 43·7	66 57·0	18410	17 1·7	69 39·9	16698	19 30·3	68 8·0	17832
April	14 43·1	66 58·1	18429	17 0·4	69 39·2	16711	19 27·6	68 6·6	17852
May	14 41·8	66 57·2	18421	16 59·5	69 39·1	16718	19 24·9	68 5·3	17849
June	14 41·2	66 57·0	18426	16 58·7	69 38·5	16735	19 25·3	68 5·5	17826
July	14 40·4	66 56·7	18425	16 58·6	69 38·7	16738	19 24·2	68 5·7	17838
August	14 40·3	66 57·8	18394	16 57·2	69 39·8	16723	19 27·4	68 5·5	17838
September	14 39·2	66 59·2	18409	16 56·5	69 39·7	16713	19 25·6	68 5·2	17837
October	14 38·1	66 59·0	18411	16 55·8	69 39·8	16706	19 27·2	68 6·4	17823
November	14 37·0	66 57·3	18416	16 55·1	69 39·1	16713	19 23·6	69 6·0	17856
December	14 36·1	66 58·1	18416	16 54·9	69 39·5	16710	19 24·0	68 5·3	17862
Year 1919	14 40·9	66 57·7	18416	16 58·7	69 39·6	16713	19 27·2	68 6·1	17842
Year 1918	14 50·4	66 58·4	18429	17 8·1	69 39·0	16715	19 36·2	68 6·5	17844
Year 1917	14 59·6	66 58·0	18437	17 16·3	69 38·6	16732	19 43·0	68 6·9	17855
Year 1916	15 8·8	66 57·5	18457	17 26·1	69 37·6	16756	19 53·1	68 6·6	17869
Year 1915	15 18·4	66 56·6	18463	17 35·9	69 36·9	16786	20 3·8	68 7·9*	17869
Year 1910	16 3·2	66 58·7	18503	18 23·3	69 37·8	16836	20 44·6	68 13·0	17892
Year 1905	16 32.9	67 3·8	18510	..	..	..	..	..	..

* Mean of 11 months.

LXVIII*a*.—MEAN VALUES, FOR THE YEARS SPECIFIED, OF THE MAGNETIC ELEMENTS AT OBSERVATORIES WHOSE PUBLICATIONS ARE RECEIVED AT KEW OBSERVATORY, RICHMOND.

Place.	Latitude.	Longitude.	1919.				1918.				1917.			
			Declination.	Inclination.	Horizontal Force.	Vertical Force.	Declination.	Inclination.	Horizontal Force.	Vertical Force.	Declination.	Inclination.	Horizontal Force.	Vertical Force.
	° ′ N.	° ′	° ′	° ′ N.	γ	γ	° ′	° ′ N.	γ	γ	° ′	° ′ N.	γ	γ
Sitka (Alaska)	57 3	135 20 W.	..	..	..	..	30 24·9 E.	74 23·8	15580	55790	30 24·7 E.	74 24·8	15584	55866
Rude Skov	55 51	12 27 E.	8 7·4 W.	68 58·2	17144	44592	8 17·1 W.	68 56·5	17167	44587	8 26·0 W.	68 54·7	17198	44599
Eskdalemuir	55 19	3 12 W.	16 58·7 W.	69 39·6	16713	45084	17 8·1 W.	69 39·0	16715	45067	17 16·3 W.	69 38·6	16732	45093
Meanook	54 37	113 21 W.	27 41·1 E.	77 54·2	12944	60400	27 44·3 E.	77 54·5	12938	60393	27 46·1 E.	77 55·0	..	..
Stonyhurst	53 51	2 28 W.	15 58·6 W.	68 43·1	17286	44376	16 8·6 W.	68 43·3	17330	44501	16 16·5 W.	68 42·0	17341	44475
Potsdam	52 23	13 4 E.	7 44·4 W.	66 31·7	18635	42915	7 54·0 W.	66 30·0	18658	42911	8 2·8 W.	66 28·2	18685	42910
Seddin	52 17	13 1 E.	7 45·7 W.	66 28·7	18673	42900	7 55·3 W.	66 27·0	18696	42896	8 4·1 W.	66 25·2	18723	42895
De Bilt (Utrecht)	52 5	5 11 E.	11 34·3 W.	66 51·5	18410	43075	11 44·0 W.	66 50·7	18424	43081	11 53·6 W.	66 50·1	18443	43103
Valencia (Ireland)	51 56	10 15 W.	19 27·2 W.	68 6·1	17842	44385	19 36·2 W.	68 6·5	17844	44407	19 43·0 W.	68 6·9	17855	44448
Kew (Richmond)	51 28	0 19 W.	14 40·9 W.	66 57·7	18416	43305	14 50·4 W.	66 58·4	18429	43361	14 59·6 W.	66 58·0	18437	43365
Greenwich	51 28	0 0	14 18·2 W.	66 53·3	18454	43242	14 27·8 W.	66 52·8	18464	43247	14 37·0 W.	66 53·2	18480	..
Prague	50 5	14 25 E.	..	..	..	..	..	..	..	..	7 5·3 W.	..	..	..
Val Joyeux (near Paris)	48 49	2 1 E.	..	..	..	..	13 12·4 W.	64 43·2	19680	41669	13 21·5 W.	64 41·2	19690	41629
O'Gyalla	47 53	18 12 E.	..	..	..	..	5 21·9 W.	..	20917	..	5 31·0 W.	..	20945	..
Pola	44 52	13 51 E.	..	..	..	..	7 11·0 W.	60 9·0	22113	38533	7 19·2 W.	60 6·8	22124	38494
Agincourt (Toronto)	43 47	79 16 W.	6 41·0 W.	74 44·9	15885	58200	6 38·3 W.	74 44·8	15916	58366	6 36·2 W.	74 44·2	15950	58449
Tortosa	40 49	0 30 E.	12 7·6 W.	57 41·1	23291	36821	12 16·1 W.	57 42·8	23298	36872	12 24·9 W.	57 44·3	23301	36914
Coimbra	40 12	8 25 W.	15 29·4 W.	58 25·0	23075	37538	15 35·6 W.	58 26·7	23062	37545	15 42·6 W.	58 29·6	23059	37618
Cheltenham (Maryland)	38 44	76 50 W.	..	..	..	..	6 12·4 W.	70 53·0	19221	55456	6 10·4 W.	70 51·5	19276	55532
San Fernando	36 28	6 12 W.	14 8·5 W.	..	25101	..	14 12·4 W.	54 2·2	24976	34423	14 21·1 W.	54 9·0	24986	34580
Tucson (Arizona)	32 15	110 50 W.	..	..	..	..	13 47·1 E.	59 26·5	26982	45701	13 46·1 E.	59 26·4	27021	45763
Lu-kia-pang	31 19	121 2 E.	..	..	..	..	3 18·8 W.	45 31·0	33212	33817	3 17·8 W.	45 31·5	33201	33815
Dehra Dún	30 19	78 3 E.	1 56·1 E.	44 54·8	32962	32863	2 1·4 E.	44 49·6	32980	32782	2 6·5 E.	44 44·1	33010	32704
Helwan	29 52	31 21 E.	..	..	..	..	..	..	..	..	1 45·7	41 1·9	29963	26076
Hong Kong	22 18	114 10 E.	0 19·8 W.	30 47·5	37158	22143	0 17·9 W.	30 48·3	37151	22150	0 16·3 W.	30 50·4	37155	22183
Honolulu (Hawaii)	21 19	158 4 W.	..	..	..	..	9 48·6 E.	39 26·7	28905	23781	9 46·3 E.	39 27·1	28935	23812
Toungoo	18 56	96 27 E.	0 20·2 W.	23 8·3	39097	16707	0 16·5 W.	23 8·4	39067	16696	0 12·7 W.	23 8·5	39037	16684
Alibag (Bombay)	18 39	72 52 E.	0 24·5 E.	24 49·3	36899	17067	0 28·4 E.	24 43·0	36886	16979	0 32·5 E.	24 35·8	36875	16880
Vieques (Porto Rico)	18 9	65 26 W.	..	..	..	..	3 34·0 W.	51 10·9	27985	34783	3 27·0 W.	51 2·7	28066	34714
Antipolo	14 36	121 10 E.	..	..	..	..	0 35·5 E.	16 5·0	38115	10986	0 35·9 E.	16 7·7	38088	11014
Kodai-Kanal	10 14 S.	77 28 E.	1 44·5 W.	4 33·5 S.	37753	3010	1 39·2 W.	4 30·3 S.	37694	2969	1 33·8 W.	4 27·1 S.	37661	2931
Mauritius	20 6	57 33 E.	10 10·5 W.	52 42·8	23112	30356	10 3·2 W.	52 44·9	23149	30447	9 54·5 W.	52 48·6	23181	30551
Pilar (Argentine)	31 40	63 53 W.	..	..	..	..	8 5·6 E.	25 39·5	25398	12200	8 13·7 E.	25 41·0	25450	12240
Melbourne	37 50	114 58 E.	..	..	..	..	..	..	..	..	8 3·2 E.	67 50·9	22961	56400
Christchurch, N.Z.	43 32	172 37 E.	16 58·6 E.	68 7·8	22280	55507	16 55·7 E.	68 6·7	22304	55516	16 53·0 E.	68 4·8	22328	55486

LXVIII*b*.—ADDITIONAL VALUES FOR EARLIER YEARS.

			1916.				1915.				1914.			
	° ′ N.	° ′	° ′	° ′ N.	γ	γ	° ′	° ′ N.	γ	γ	° ′	° ′ N.	γ	γ
Sodankylä	67 22	26 39 E.	..	..	..	..	0 27·2 E.	75 22·1	12853	49232	0 18·3 E.	75 19·2	12905	49260
Kasan	55 50	48 51 E.	..	..	..	..	..	..	..	..	8 21·3 E.	69 22·1	17891	47517
Uccle (Brussels)	50 48	4 21 E.	..	..	..	..	12 38·3 W.	66 1·2	18989	42690	12 48·0 W.	66 0·7	19007	42714
Prague	50 5	14 25 E.	7 14·3 W.	..	..	..	7 24·2 W.	..	..	..	7 32·1 W.	..	..	..
Helwan	29 52	31 21 E.	1 53·7 W.	40 57·5	29985	26026	2 3·0 W.	40 54.8	30012	26009	2 9.2 W.	40 50·9	30016	25954
Barrackpore	22 46 S.	88 22 E.	..	..	..	..	..	.. S.	..	..	0 32·2 E.	30 58·9 S.	37403	22459
Batavia	6 11	106 49 E.	..	..	..	..	0 46·1 E.	31 33·6	36676	22528	0 46·2 E.	31 28·8	36685	22464
Tananarivo	18 55	47 32 E.	..	..	..	..	..	..	..	..	8 25·2 W.	53 37·9	22484	30532

A.—DIURNAL INEQUALITIES OF POTENTIAL GRADIENT IN THE OPEN, IN VOLTS PER METRE.

Mean Hourly Values, Greenwich Mean Time, for the Months, Year, and Seasons (Selected Quiet Days only).

Richmond (Kew Observatory). **1919.**

	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	Non-cyclic change. 24–0	No. of Days Used	Mean Value
	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m		v/m
J.	− 70	− 71	− 60	n̄ 75	− 57	− 33	42	53	23	69	48	0	−29	− 23	−29	− 6	48	79	x101	40	45	1	− 21	− 74	..	..	638
F.	− 36	− 54	− 60	− 71	n̄115	−104	− 76	22	41	71	75	12	− 32	− 52	− 35	3	7	35	63	66	x 96	85	54	5	..	..	482
M.	5	− 53	−109	−122	n̄127	− 97	− 27	50	47	12	− 37	− 39	− 23	− 24	− 23	− 2	10	26	63	92	x145	130	57	46	− 55	..	381
A.	− 51	− 88	− 84	n̄ 91	− 78	8	82	106	x115	99	42	7	− 12	− 8	− 11	− 11	− 19	− 14	29	44	24	− 8	− 24	− 59	− 79	..	284
M.	− 81	n̄119	−110	−112	n̄119	− 38	27	53	43	54	9	− 7	− 5	17	8	19	39	83	86	x 93	71	55	− 9	− 58	− 11	..	328
J.	− 12	− 16	2	− 4	1	18	52	x 58	46	13	− 5	− 19	− 24	− 35	n̄ 38	− 24	− 11	− 9	5	6	8	8	9	− 30	+ 8	..	160
J.	− 30	− 42	n̄ 58	− 42	− 16	11	24	34	42	21	− 21	− 14	− 26	− 14	− 19	− 20	− 25	− 2	23	47	x 70	45	18	− 5	+ 9	..	203
A.	− 25	− 18	− 7	− 10	3	50	x 85	78	47	40	− 1	− 20	− 28	− 34	− 45	n̄ 48	− 45	− 31	− 16	16	18	10	− 3	− 16	+ 3	..	163
S.	− 29	− 33	− 54	n̄ 56	− 41	− 12	48	x 86	66	49	4	− 15	− 19	− 26	− 29	− 29	− 9	23	41	33	37	14	− 22	− 27	− 18	..	243
O.	− 36	n̄ 69	− 57	− 66	− 36	− 15	52	x114	98	65	35	− 9	− 48	− 60	− 46	− 7	23	24	26	50	31	2	− 32	− 40	− 12	..	295
N.	−131	−141	−147	−158	n̄168	−131	− 76	10	49	83	x116	111	98	51	89	x116	95	70	56	51	61	10	− 22	− 92	..	..	395
D.	7	− 11	− 44	− 55	− 66	n̄ 74	− 54	− 23	− 4	− 4	33	− 8	0	16	43	20	36	x 69	47	53	− 9	− 7	1	34	..	..	397
Y.	− 41	− 59	− 65	n̄ 71	− 68	− 35	14	x 53	51	47	25	0	− 12	− 16	− 11	1	13	30	44	49	49	28	0	− 26	..	..	331
W.	− 57	− 69	− 78	− 90	n̄101	− 86	− 41	16	27	55	x 68	29	9	− 2	16	33	46	63	67	53	48	22	3	− 32	..	..	478
Eq.	− 28	− 61	− 76	n̄ 84	− 71	− 29	39	x 89	82	56	11	− 14	− 25	− 29	− 27	− 12	1	15	40	55	59	34	− 5	− 20	..	..	301
S.	− 37	n̄ 49	− 43	− 42	− 33	10	47	x 56	44	32	− 4	− 15	− 21	− 17	− 23	− 18	− 10	10	24	40	42	30	4	− 27	..	..	214

B.—DIURNAL INEQUALITIES OF POTENTIAL GRADIENT IN THE OPEN, IN VOLTS PER METRE.

Eskdalemuir. *Mean Hourly Values, Greenwich Mean Time, for the Months, Year, and Seasons (0a, Days only).* **1919.**

	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	24 –0	No. of Days Used	Mean Value
	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m		v/m
J.	38	− 28	− 42	− 49	− 41	− 48	− 50	n̄ 59	− 57	− 52	− 16	− 23	− 13	21	36	17	61	75	79	x116	70	15	− 28	− 8	71	8	308
F.	− 17	− 50	− 58	n̄ 63	− 52	− 38	− 38	7	49	22	4	11	− 7	− 9	− 28	− 31	− 9	22	49	x 82	77	41	28	6	95	16	276
M.	43	17	− 12	− 44	− 39	− 41	6	16	− 7	− 54	− 39	− 24	− 23	− 46	n̄ 62	− 44	− 40	16	9	59	84	x 96	59	72	− 5	8	245
A.	79	− 3	5	− 15	− 32	− 55	− 40	− 40	− 50	− 40	n̄ 55	− 54	− 25	− 48	− 18	− 38	− 42	− 14	7	65	x133	111	79	90	57	6	241
M.	32	25	36	51	x 60	35	24	14	− 18	− 52	n̄ 67	− 55	− 58	− 59	− 51	− 40	− 47	− 35	− 7	34	50	57	43	22	2	17	218
J.	32	42	29	4	− 14	− 18	− 27	− 31	− 33	n̄ 44	− 30	− 29	− 29	− 17	− 19	− 4	− 15	− 6	22	36	43	41	x 47	19	10	10	155
J.	9	8	18	14	22	x 65	30	3	− 9	− 8	− 19	− 22	− 24	− 30	− 27	n̄ 40	− 38	− 33	− 20	16	27	31	23	6	0	12	190
A.	17	15	4	0	− 18	3	− 14	− 34	− 37	− 46	n̄ 48	− 36	− 26	− 15	− 19	1	− 4	26	26	45	x 57	38	26	43	− 5	10	171
S.	3	11	− 16	5	15	25	64	12	− 6	− 42	n̄ 57	− 44	− 40	− 55	− 53	− 52	− 34	8	77	x 89	78	21	− 3	0	111	9	221
O.	18	12	− 15	3	0	− 15	− 53	− 44	− 50	n̄ 57	− 56	− 48	− 32	− 22	− 17	0	30	56	75	49	x 96	42	25	16	10	12	270
N.	4	− 11	− 27	− 18	68	97	− 26	− 42	− 73	− 5	− 13	− 68	− 70	− 66	n̄117	− 88	− 8	− 17	98	x163	150	8	36	25	− 77	3	360
D.	− 95	−104	− 96	n̄134	− 76	− 40	−104	−128	− 87	− 59	− 51	− 15	− 15	84	149	162	x172	152	141	47	84	91	− 18	− 60	138	4	319
Y.	14	− 6	− 15	− 22	− 9	− 3	− 19	− 27	− 32	− 36	n̄ 37	− 34	− 30	− 22	− 19	− 13	2	21	46	67	x 79	49	26	19	..	115	248
W.	− 18	− 48	− 56	n̄ 66	− 25	− 7	− 55	− 56	− 42	− 23	− 19	− 24	− 26	8	10	15	54	58	92	x102	95	39	4	− 9	..	31	316
Eq.	36	7	− 10	− 17	− 14	− 22	− 6	− 14	− 28	− 48	n̄ 52	− 43	− 30	− 43	− 38	− 34	− 22	17	42	65	x 98	68	40	45	..	35	244
S.	23	23	22	17	13	21	4	− 12	− 24	− 38	n̄ 41	− 35	− 34	− 30	− 29	− 21	− 26	− 12	5	33	x 44	42	35	23	..	49	182

C.—DIURNAL INEQUALITIES OF POTENTIAL GRADIENT IN THE OPEN, IN VOLTS PER METRE.

Eskdalemuir. *Mean Hourly Values, Greenwich Mean Time, for the Months, Year, and Seasons (1a, and 2a Days only).* **1919.**

	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midt.	24–0	No. of Days Used	Mean Value
	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m	v/m		v/m
J.	− 75	− 89	− 62	5	x 89	67	38	4	15	81	82	6	− 30	− 4	− 9	40	− 28	24	81	34	− 37	− 77	n̄ 98	− 54	113	3	283
F.	− 67	− 57	n̄ 73	− 61	− 10	− 1	43	43	− 26	− 46	6	− 3	64	x 82	44	− 16	17	4	17	13	14	3	− 33	41	−102	5	162
M.	10	− 14	− 41	− 42	− 39	− 49	− 44	− 18	− 23	− 38	− 29	− 11	− 1	− 15	− 16	− 42	n̄ 71	− 13	41	70	103	x154	83	46	72	4	164
A.	− 19	− 16	− 59	− 70	n̄ 76	− 20	5	17	23	9	− 6	− 27	− 2	− 2	42	45	x 74	60	6	− 28	− 10	6	40	8	−111	6	179
M.	28	− 54	− 64	83	80	48	80	x110	78	− 26	− 70	−116	− 58	− 12	− 18	− 71	n̄140	− 68	− 38	20	34	64	82	35	252	2	152
J.	5	− 8	− 9	29	x 30	25	12	20	4	20	7	19	12	12	− 6	− 13	− 8	− 52	− 35	− 9	2	− 2	n̄ 80	24	16	4	130
J.	− 28	− 28	11	11	11	23	8	− 21	0	− 31	− 13	− 24	− 9	4	− 6	− 4	13	22	x 43	41	41	1	n̄ 39	− 24	34	7	104
A.	45	x 57	25	11	4	− 1	n̄ 62	23	− 7	− 35	− 37	− 11	2	4	− 38	− 41	− 28	− 38	− 19	36	11	18	49	32	94	5	156
S.	29	− 38	− 61	n̄ 92	− 52	− 52	− 44	− 18	− 27	− 52	− 44	− 45	− 23	− 19	− 19	11	25	88	x135	125	37	9	73	53	−150	4	175
O.	− 33	− 68	n̄114	−107	− 89	− 80	− 36	− 11	− 39	− 11	− 47	− 20	− 24	39	− 3	34	− 44	25	149	138	x200	99	49	− 36	−182	5	230
N.	− 81	−117	n̄123	− 49	− 36	− 37	− 34	− 77	− 2	− 62	− 16	66	8	− 29	− 85	− 54	36	226	x283	173	29	13	11	− 38	− 97	3	244
D.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	..
Y.	− 17	− 39	n̄ 52	− 26	− 8	− 7	− 3	7	0	− 15	− 15	− 15	− 6	5	− 10	− 10	− 14	25	x 60	56	36	29	12	8	..	48	180
W.	− 74	n̄ 88	− 80	− 35	14	10	16	− 10	− 4	− 9	24	23	14	16	− 17	− 10	8	85	x127	73	2	− 20	− 40	− 17	..	11	230
Eq.	− 3	− 34	− 69	n̄ 78	− 64	− 50	− 30	− 8	− 17	− 17	− 31	− 26	− 13	1	1	12	− 4	40	x 83	76	75	74	61	18	..	19	187
S.	13	− 8	− 9	x 34	31	24	10	33	19	− 18	− 28	− 33	− 13	0	− 17	− 32	n̄ 41	− 34	− 12	22	22	20	3	17	..	18	135

x and *n̄* mark respectively the mean maximum and minimum hourly values in each month or season.

* See Notes on the Tables of Potential Gradient, page 72.

Notes on the Meteorological Summaries.

In the meteorological tables in the present volume the diurnal variation of pressure, temperature, humidity, rainfall, sunshine and windspeed is shown. The tables differ from those published for the years 1911 to 1917 in that the 1919 values of the various elements are printed, not their departures from normal. These values are averages for the months and the year; the individual readings from which the averages are derived are available for reference at the Meteorological Office. For the years 1874 to 1886 and 1900 to 1913 such hourly readings were published *in extenso*. For the years 1869 to 1889 and 1887 to 1899 five-day means were printed.

The normal hourly values computed for periods ending 1915 will be found in the 1917 volume.

In the tables for pressure, temperature and relative humidity, values at oh. and 24h. are both given. The small difference between them is due to the fact that the readings at the midnights with which a month opens and closes are in general different. In estimating the mean of all the readings for the month these first and last readings are given half-weight. New tables of the diurnal inequalities of pressure and temperature have been introduced. In preparing these tables the non-cyclic change has been eliminated by the use of the formulæ given in footnotes.

Particulars of the methods of tabulation and of the instruments are published in the Introduction to *Part IV., Section* 1 of the *Year Book* for 1913 and in the *Annual Reports of the Meteorological Office* for the years 1867 and 1869. The barographs and the thermographs with dry and wet bulbs are photographic; the speed of the wind is recorded by cup anemometers, except at Eskdalemuir where a tube-anemometer is used for the hourly tabulations; the rain gauges in use are of Beckley's pattern; the duration of bright sunshine is measured by the Campbell-Stokes sunshine recorder.

The values in the tables have been expressed throughout in units based upon the C.G.S. system; tables for conversion to other units were given with the Notes for 1913. They will be found in the *Computer's Handbook*.

Some points of importance in the history of the observations are referred to in the *Notes* for 1917. They are not reproduced here as the present tables cover only the year 1919. It should be mentioned, however, that the system of time-marking previously in use introduced some uncertainty in the readings of the barograms and thermograms. The time marks occur at intervals of two hours and alternate readings used to be made at a time-mark and halfway between two time-marks. From January 1st, 1918, the time-marks have been made half-an-hour before each even hour instead of at the hour so that there is an unbroken curve for the hourly readings.

(*a*) *Pressure.*—The barometer readings are obtained from the hourly tabulations of photographic records from similar apparatus at all the observatories. Due allowance is made for the variation of gravity with latitude. The pressures refer to station level, *i.e.*, to the level of the cistern of the control-barometer, the readings of the curves being compared three times a day with those of this barometer. Tables for " reduction " of pressure to sea-level are printed in the Introduction to *Part IV, Section* 1 of the *Year Book* for 1913.

(*b*) *Temperature of the Air.*—Temperature is expressed in degrees absolute on the Kelvin Scale. The value of a degree is the same as on the centigrade scale, but the zero is taken to be the absolute zero of temperature, 273°C. below the normal freezing-point of water. The practice of indicating "degrees absolute" by "a" instead of by °A has been adopted recently. Thus the temperature of the freezing point of water is written 273a. Conversion from the centigrade to the absolute scale is a simple addition or subtraction. Tables for converting from the Fahrenheit to the absolute scale are given in the *Computer's Handbook.*

The temperatures shown for all four Observatories have been derived from the tabulation of photographic records from similar mercurial thermometers. At Eskdalemuir the thermometer screen is a large hut with louvred sides. At the other observatories the screen is on the north wall of the observatory building. In the case of Aberdeen the screen in question is the tower of King's College at a height of 12·5m. above ground.

At Valencia Observatory the north wall screen was modernised at the beginning of 1919 by the provision of a double roof, double louvres on all sides and a ventilated bottom to exclude all direct radiation. It was formerly a single louvred wooden shelter.*

(*c*) *Relative Humidity* is obtained from the tabulation of the photographic records of temperature combined with those of the wet-bulb thermometer. The thermometers are similar at all the Observatories; they have cylindrical bulbs about four inches long. The values of the humidity are calculated by the use of the Meteorological Office tables, which are based upon Glaisher's factors.†

The means for Richmond, Eskdalemuir, and Cahirciveen are obtained from the hourly values of humidity for each day; the means for Aberdeen are calculated from the mean hourly values for the month of the dry and wet-bulb temperatures.

Mention should be made here of a difficulty inherent in the psychrometric method of determining the relative humidity of the air. The depression of the wet-bulb reading depends, not only on the amount of vapour present in the air, but also on the strength of the wind blowing past the thermometers. The tables in use for computing the humidity take no account of the wind, and the results are, therefore, open to criticism.

(*d*) *Wind.*—The speed of the wind is obtained from the records of similar Robinson anemographs at Richmond, Cahirciveen, Falmouth, and Aberdeen, but at Eskdalemuir the records are made by a Dines Pressure-tube instrument. Anemographs of the latter type are also in operation at the other observatories and the charts are used in other publications of the office, *e.g.*, in the *Monthly Weather Report Annual Summary.*

The records from instruments of the two types, exposed at the same place, give approximately the same values for the mean speed.

More serious than any imperfections in the anemometers themselves is the difficulty in determining the relation between the wind which crosses the Observatory at a particular height and the general flow of air in the neighbourhood. In the extreme case of the anemometer at Falmouth,‡ the recorded speed is probably only half of what would be measured at the same height above ground in open country. The anemometer at Cahirciveen is on a tower at the NE corner of the main building, so that the exposure is less free for winds between SE and SW than for other directions.

(*e*) *Rainfall.*—In this table totals for the hours have been given instead of means. The first and last entries refer to the half hours beginning and ending at midnight.

---

* L.H.G. Dines. Meteorological Office Professional Notes No. 23, 1921.
† See Computer's Handbook Section 1.
‡ Not published now.

(*f*) *Sunshine.*—The duration of bright sunshine is obtained by the Campbell-Stokes sunshine recorder and is therefore measured by the burning or scorching of a blue card by the focussed sunlight. The values are given in hours and are obtained by dividing the totals for each month by the number of days in the month. It should be noted that the entries refer to Local Apparent Time.

Harmonic Analysis.—The systematic analysis of the records of pressure and temperature of the seven observatories of the Meteorological Office by means of the beautiful harmonic analyser invented by W. Thomson (Lord Kelvin) was a notable enterprise of the period 1871–1882. The results for each month of these years are published in *Harmonic Analysis of Hourly Observations of Air Temperature and Pressure at British Observatories:* Official Publication, No. 93. This volume contains also the harmonic components for the average diurnal variation in the several months for the same period.* Corresponding data for longer periods have not been published by the Office. The annual mean diurnal variation of pressure at the Observatories has been analysed, however, for these Notes for the last few years. Results for 1919 are set out below, the normals for the older observatories being for 1871–1915, those for Eskdalemuir for 1911–1915 :—

Harmonic Analysis of Pressure, 1919.

Observatory and Period.	Amplitude in Millibars.				Phase Angle, Greenwich Mean Time.								Phase Angle, Local Mean Time.			
					24-Hour Term.		12-Hour Term.		8-Hour Term.		6-Hour Term.					
	P_1	P_2	P_3	P_4	A_1	Max.	A_2	Max.	A_3	Max.	A_4	Max.	A_1	A_2	A_3	A_4
					°	h m	°	h m	°	h m	°	h m	°	°	°	°
Aberdeen, 1919 ..	·152	·246	·039	·014	164·1	19 4	144·7	10 11	356·1	2 52	289·7	2 40	166·2	148·9	2·4	298·1
„ Normal ..	·116	·249	·028	·009	157·8	19 29	143·6	10 13	349·5	2 14	335·7	1 55	159·9	147·8	355·8	344·1
Eskdalemuir, 1919 ..	·127	·252	·031	·016	96·0	23 36	145·1	10 10	352·2	2 11	306·1	2 24	99·3	151·5	1·8	318·9
„ Normal	·083	·257	·023	·016	75·1	1 0	141·9	10 16	15·0	1 40	330·6	1 59	78·3	148·3	24·6	343·4
Richmond (Kew Obs.) 1919	·251	·328	·035	·009	18·3	4 47	147·4	10 5	350·9	2 12	274·9	2 55	18·6	148·0	351·8	276·1
„ Normal	·138	·351	·030	·008	28·1	4 7	149·5	10 1	1·6	1 58	274·7	2 55	28·4	150·1	2·6	276·0
Cahirciveen (Val. Obs.) 1919	·130	·293	·031	·003	164·6	19 2	131·7	10 37	0·1	2 0	304·9	2 25	174·9	152·3	31·0	346·1
„ Normal	·151	·307	·034	·004	177·8	18 9	130·9	10 38	331·9	2 37	42·3	0 48	188·1	151·5	2·8	83·5

The notation is explained by two alternative formulæ for the inequality in question :

$$P_1 \sin (15t+A_1)^\circ + P_2 \sin (30t+A_2)^\circ + P_3 \sin (45t+A_3)^\circ + P_4 \sin (60t+A_4)^\circ + \ldots$$

and

$$P_1 \cos 15(t-T_1)^\circ + P_2 \cos 30(t-T_2)^\circ + P_3 \cos 45(t-T_3)^\circ + P_4 \cos 60(t-T_4)^\circ + \ldots$$

Here t is the time elapsed in hours since midnight and T_1, T_2, T_3, T_4 are the times of maxima of the four harmonic terms. The times of the corresponding minima differ from those of the maxima by twelve, six, four, and three hours respectively. While it has been convenient to record all the times to minutes this degree of accuracy can hardly be claimed.

It is of importance to note that whilst the 12-hour term is known to be fairly consistent throughout the year, the other terms are subject to very large changes from month to month.

It may also be mentioned that the "normal" values of the P's refer to the normal diurnal variation. The average values of the P's for individual years would naturally be greater.

* The results have been discussed recently by Dr. C. Chree, *Q.J.R. Met. Soc.* xliv., 1918, p. 99.

ADDITIONAL INFORMATION.

For a general account of the weather of the year, reference should be made to the Annual Summary of the *Monthly Weather Report.* Daily readings at Richmond, Cahirciveen, and Eskdalemuir are published in the *Geophysical Journal,* corresponding data for Aberdeen in *Daily Readings at Meteorological Stations of the First and Second Orders.* A summary of the monthly values at each of the four observatories is to be found in the Annual Supplement to the last-named publication.

Climatic diagrams based on the average hourly values up to 1910 are given for Aberdeen, Cahirciveen, Falmouth and Richmond in *The Weather Map.*

Graphs of diurnal variation of temperature at the same observatories for the period 1871 to 1895 are given in *Temperature Tables for the British Islands.* The corresponding pressure-graphs are reproduced in a paper by R. H. Curtis.*

Normal values for various elements are given in the *Book of Normals* which is in course of publication.

* *Q.J.R. Met. Soc.*, xxvi., 1900, p. 1.

RAINFALL: MONTHLY TOTALS OF HOURLY VALUES.

Amounts, in millimetres, for periods of sixty minutes centred at the exact hours, Greenwich Mean Time.*

Falmouth: $Hr = 50.8$ m. $+ 0.6$ m. **1919.**

G.M.T.	0 to 0·5	1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	23·5 to 24	Day.
Jan.	5·0	4·4	2·6	3·4	6·9	4·0	4·7	3·3	6·7	6·0	6·4	13·6	10·5	10·2	12·4	14·7	12·6	5·8	7·3	7·8	15·6	6·7	9·8	3·3	1·8	185·5
Feb.	2·5	6·5	5·5	9·2	7·8	7·1	5·4	4·2	4·8	8·8	9·7	6·1	6·2	6·9	6·1	5·8	5·8	8·5	7·8	3·9	4·6	5·8	8·9	7·0	1·8	156·7
Mar.	5·5	7·1	8·9	7·0	7·3	7·2	4·7	4·6	6·1	6·6	10·0	11·5	12·2	3·5	0·8	2·5	3·9	0·8	1·6	4·3	5·3	9·4	6·5	8·6	6·6	152·5
April	3·2	9·1	6·1	5·8	4·3	2·9	2·2	1·7	3·1	3·7	7·0	1·5	2·1	3·7	3·1	4·9	0·8	1·0	1·4	1·4	0·3	1·9	1·0	3·4	2·2	77·8
May	0·7	1·6	2·5	5·6	3·0	0·9	0·6	0·1	0·2	1·4	2·6	0·6	1·6	1·6	1·1	1·6	3·3	2·9	3·7	3·0	3·1	0·5	3·2	3·5	0·7	49·6
June	0·6	1·0	0·6	1·5	3·8	2·9	3·2	2·1	0·6	0·4	1·6	1·1	0·6	0·2	1·6	0·0	0·7	0·3	0·4	0·2	0·2	0·2	0·2	0·2	0·4	24·6
July	0·4	0·6	0·1	0·6	1·2	3·4	2·0	0·9	0·8	0·1	0·0	0·0	0·0	0·0	0·4	0·5	0·9	0·1	0·5	0·2	0·0	0·7	3·1	3·6	1·5	21·6
Aug.	0·6	1·4	*7·0*	*10·6*	*18·5*	*11·1*	*8·2*	2·8	0·6	0·2	2·3	1·6	0·3	3·3	2·1	1·7	12·0	4·7	1·2	1·1	0·8	0·4	2·0	3·5	0·5	98·5
Sept.	0·2	0·7	2·5	4·2	2·8	4·9	1·9	3·5	1·6	0·6	0·0	2·7	4·2	4·4	9·2	0·0	0·0	0·2	0·0	0·2	0·2	0·7	0·6	1·2	0·0	46·5
Oct.	1·6	4·7	1·3	1·1	1·6	1·3	1·0	0·3	1·0	0·9	0·8	0·3	1·9	2·5	1·9	1·8	1·7	0·5	1·2	2·9	3·3	2·7	1·4	1·4	1·9	41·0
Nov.	1·3	4·2	5·5	7·5	6·0	4·0	3·7	1·1	1·5	5·5	2·3	1·1	0·3	0·9	0·3	0·5	2·8	4·8	5·0	5·8	7·8	8·1	7·1	6·8	1·3	95·2
Dec.	3·8	3·2	3·8	3·2	7·5	7·0	4·5	1·2	2·7	6·7	9·9	11·1	10·6	15·8	17·0	15·4	7·8	6·2	7·8	9·2	7·0	7·2	5·3	12·1	7·7	193·7
Year	25·4	44·5	46·4	59·7	70·7	56·7	42·1	25·8	29·7	40·9	52·6	51·2	50·5	53·0	56·0	49·4	52·3	35·8	37·9	40·0	48·2	44·3	49·1	54·6	26·4	1143·2

DURATION OF BRIGHT SUNSHINE: MONTHLY MEANS OF HOURLY VALUES.

Amounts for periods of sixty minutes centred at the hours of Local Apparent Time.

Falmouth: $hs = 10.4$ m. **1919.**

L.A.T.	4	5	6	7	8	9	10	11	Noon.	13	14	15	16	17	18	19	20	Day.
Jan. ..	..	..	..	..	·01	·24	·33	·36	·35	·34	·28	·24	·03	..	..	..	..	2·18
Feb. ..	..	..	..	·02	·10	·23	·25	·31	·28	·23	·23	·26	·21	·02	..	..	..	2·14
March ..	..	..	·01	·20	·35	·43	·49	·48	·46	·53	·50	·41	·30	·17	·02	..	..	4·35
April ..	..	..	·13	·42	·48	·51	·54	·54	·53	·50	·54	·62	·60	·37	·17	..	..	5·95
May ..	..	·04	·26	·39	·44	·45	·50	·44	·46	·51	·55	·54	·57	·46	·28	·07	..	5·96
June ..	..	·24	·50	·52	·52	·50	·50	·53	·54	·56	·59	·58	·64	·58	·47	·37	·01	7·65
July ..	..	·14	·37	·43	·47	·52	·60	·64	·65	·70	·68	·64	·62	·58	·54	·32	..	7·90
August ..	..	·01	·27	·46	·55	·63	·60	·61	·57	·58	·59	·62	·58	·58	·52	·15	..	7·32
September ..	..	..	·02	·22	·35	·37	·37	·47	·55	·53	·50	·50	·50	·32	·08	..	..	4·78
October ..	..	..	..	·12	·47	·56	·60	·57	·55	·57	·55	·58	·44	·12	..	..	..	5·13
November ..	..	..	..	..	·07	·24	·31	·40	·38	·35	·28	·23	·11	..	..	..	..	2·37
December ..	..	..	..	..	..	·11	·25	·34	·31	·29	·27	·14	·03	..	..	..	..	1·74
Year ..	..	·04	·13	·23	·32	·40	·45	·47	·47	·47	·46	·45	·39	·27	·17	·08	·00	4·80

* The half-hours before and after midnight are tabulated separately.

TERRESTRIAL MAGNETISM: 1. NOTES ON THE MANAGEMENT OF THE INSTRUMENTS AT KEW OBSERVATORY, RICHMOND, AND ON THE CORRESPONDING TABLES, 1918.

By C. CHREE, Sc.D., LL.D., F.R.S., Superintendent.

The magnetographs have continued in regular operation during the year and absolute observations of declination, dip and horizontal force have been taken, usually once a week. The instruments employed have been the Jones unifilar and the Barrow dip circle. The results of the absolute observations have appeared month by month in the *Geophysical Journal*. On January 14th a scale-value determination of the horizontal force magnetograph gave 1 mm. = 5·9 γ. This was checked several times during the year and found to remain unaltered. Several scale value determinations were made of the vertical force magnetograph, the values of 1 mm. in terms of force being 17·4 γ on January 15th, 14·6 γ on July 11th, and 15·9 γ on December 8th. The sensitiveness was somewhat increased on December 15th, and during the rest of the month the behaviour of the instrument was somewhat variable. The scale value of the declination magnetograph remained as in previous years 1 mm = 0′·87.

The base values of the curves were determined by means of the absolute observations. These were taken as in past years with the Jones unifilar magnetometer, using collimator magnet K.C.I., mirror magnet AN, and declination magnet KO 90, and with Barrow dip circle, No. 33, with $3\frac{1}{2}$-inch needles. In the absolute observations of horizontal force deflections were made at three distances—22·5, 30 and 40 cms, and values were calculated for the distribution constants P and Q from all the observations of the year combined. The values obtained of late years have been as follows:—

Year.	P.	Q.	Mean Value at 22·5, 30 and 40 cms. of $\log_{10}(1+Pr^{-2}+Qr^{-4})$
1910	+ 0·882	− 1354	$\bar{1}$·99939
1911	+ 0·832	− 1377	$\bar{1}$·99934
1912	+ 0·749	− 1286	$\bar{1}$·99937
1913	+ 1·504	− 1528	$\bar{1}$·99959
1914	+ 1·226	− 1343	$\bar{1}$·99958
1915	+ 0·778	− 1245	$\bar{1}$·99942
1916	+ 2·962	− 2044	$\bar{1}$·99996
1917	+ 0·696	− 1236	$\bar{1}$·99938
1918	+ 1·683	− 1565	$\bar{1}$·99965
1919	+ 1·496	− 1525	$\bar{1}$·99958

Originally the observations made during 1919 were reduced, employing the values obtained for P and Q in the previous year. The substitution of the values appropriate to 1919 entailed a correction of − 1 γ to the calculated values of H. This result was, however, obtained in time to secure the publication of the corrected values in the *Geophysical Journal*. The disturbance of the magnetic curves by artificial electric currents has been much as in the previous year. The publication of diurnal inequalities in D and H has thus been continued. Particulars of the magnetic "character" of individual days on the international scale "0" (quiet), "1" (moderately disturbed) and "2" (highly disturbed) have been contributed quarterly as in recent years to Prof. van Everdingen at De Bilt, for inclusion in the international lists. Full details will be found in the *Geophysical Journal*. The accompanying table shows the number of days in each month to which the "characters" 0, 1 and 2 were assigned. It also gives for each month the mean of the "character" figures treated as if ordinary arithmetical quantities. As there is a wide range in the disturbance to which any one figure is attached, the monthly means should be regarded as giving only a general indication of the disturbance prevailing.

1919.	Number of Days having Magnetic " Character."			Mean of " Character " Numbers.
	" 0."	" 1."	" 2."	
January	14	11	6	0·74
February	13	10	5	0·71
March	7	16	8	1·03
April	13	15	2	0·63
May	11	15	5	0·81
June	22	8	0	0·27
July	19	10	2	0·45
August	15	13	3	0·61
September	7	19	4	0·90
October	8	14	9	1·03
November	19	9	2	0·43
December	14	13	4	0·68
Year (Totals and Means) ..	162	153	50	0·69

The mean " character " figure for the year is substantially less than for 1918, but this is considerably due to the exceptionally low value for June, which was a very quiet month. In some months, particularly March and October, disturbance was very common. On a good many occasions the disturbed conditions persisted for three or four successive days. The largest disturbances of the year occurred on the following dates: January 4th, 5th, and 16th, February 21st, April 17th, May 2nd and 3rd, August 11th and 12th, September 19th, October 1st, 4th, and 5th, and December 15th. The disturbance on August 11th–12th was quite outstanding, having an amplitude very rarely attained at Kew. It was characterised by the size and rapidity of the large oscillations both in declination and horizontal force. In the course of 20 minutes there were movements of 38′ to west and 78′ to east in the declination needle. The total range of declination in the course of the storm was at least 2° 5′. Near the time of minimum (extreme easterly declination) the trace got very close to the edge of the sheet and was very faint, so that the extreme position was difficult to assign exactly. The horizontal force trace was twice beyond the limits of registration during 10 or more consecutive minutes, and as the slope of the curve when disappearing and reappearing was steep, the visible range 840 γ may have been considerably exceeded. No vertical force trace was lost. The range recorded was approximately 950 γ, but the trace was much less oscillatory than those of the other two elements. There was a " sudden commencement " on August 11th. The first movement in H was as usual up the sheet (i.e., increase of H), but it was reversed almost immediately, and for about 80 minutes the value remained much below the normal. This is not usual, at least in moderate magnetic storms. October 1st was another occasion on which the " sudden commencement " was immediately followed by very active disturbance. On the other hand on October 4th there was a " sudden commencement " which was not followed by serious disturbance until seven hours had elapsed.

The declination and horizontal force curves were tabulated on the five international quiet days of each month, particulars of which are given in the following table:—

List of Magnetic Quiet Days for 1919 *as issued by the International Commission of Terrestrial Magnetism.*

January ..	2,	11,	25,	26,	27	July ..	5,	6,	15,	16,	28
February ..	7,	10,	11,	12,	25	August ..	6,	9,	13,	14,	31
March ..	8,	9,	10,	18,	24	September ..	1,	5,	12,	28,	30
April ..	3,	5,	14,	26,	28	October ..	12,	13,	14,	21,	25
May ..	7,	8,	11,	28,	29	November ..	7,	9,	14,	19,	20
June ..	7,	8,	19,	20,	30	December ..	1,	17,	26,	29,	31

The usual temperature correction, viz., $3\cdot1\gamma$ per 1°C, has been applied to the horizontal force curves. In view of the continual small oscillations now usual in the traces all the curves were smoothed, readings being taken exactly at the hour. The procedure differs from that adopted at Eskdalemuir where hourly values are 60 minute means.

Tables LXI*b* and LXII give the quiet day diurnal inequalities of declination and horizontal force, after elimination of the non-cyclic change for each month of the year, for the year as a whole and for three reasons defined as in previous years. x and n are attached to the maximum and minimum hourly values. The units employed throughout are 1′ in declination and 1γ (or 1×10^{-5} C.G.S.) in horizontal force. In the case of declination the minus sign means that the magnet points to the east of its mean position for the day.

Table LXIII gives the algebraic difference of the extreme hourly values, and Table LXIII*a* the mean algebraic excess of the value at 24h. over the value at oh. Eight months out of the twelve in declination, and nine months in horizontal force, show a smaller range in 1919 than in 1918. In the case of the whole year and the seasons the 1919 range is invariably the smaller. The non-cyclic change in H is positive in every single month. The value for August $+10\cdot4\gamma$ is quite exceptional, and the mean value for the year $+5\cdot4\gamma$ is much above the average. Comparing this with the range $28\cdot0\gamma$ in the mean diurnal inequality for the year, it will be realised how important it is that a uniform procedure for dealing with the non-cyclic change should be observed at all stations.

Table LXVII contains mean monthly and annual values of declination, inclination horizontal force, north and west components of force, vertical force and total force. The results for declination and horizontal force are derived from the curve measurements for the international quiet days. The inclination results are from absolute observations of dip, taken at an hour in the afternoon when the departure from the mean value for the day is small and an allowance has been made for this departure from the diurnal inequalities of previous years. The values of the other elements are derived by calculation from those of declination, inclination and horizontal force. Westerly declination continues to fall rapidly at approximately the same rate as in recent years. There seems no trace of parallelism, such as several authorities have suggested, between this rate of fall and the corresponding sunspot mean annual areas. Instead of a slight rise, as for some years past, inclination shows a fall during the year of $0'\cdot7$. As a fall appears in 10 months out of the twelve as compared with 1918, its reality, unless it be of instrumental origin, can hardly be doubted. Horizontal force shows a fall slightly in excess of the mean for the three previous years. The north component remains practically stationary, but the west component shows a fall compared with 1918 of 53γ. This fall seems to have occurred at a remarkably uniform rate, for if corresponding monthly values for 1918 and 1919 are compared it will be found that the differences all lie between 50γ and 57γ. Owing to the fall in inclination the decline in vertical force is greater than of late years.

Table LXVIII gives mean annual values of the magnetic elements at the observatories whose publications are received at the Kew Observatory, including the latest data available up to 1919.

The scheme of supplying weekly information about declination for the use of mining engineers, described in last year's volume, continued in operation. In forming the monthly diurnal inequalities for the mining engineers all days are included except those to which "character" 2 has been assigned. The data are thus described as referring to "ordinary" days. A point to be noticed is that in assigning these "character" figures regard is had only to the declination curves, and that the criteria observed differ somewhat from those observed in connection with the international scheme. Thus the distribution of 2's differs somewhat from that given in the previous table. The total number of 2's for the year, 52, is slightly greater

and the mean value of the character figure 0·65 slightly less than the values already described. The mean values for the year derived respectively from " ordinary " and " quiet " days agreed to within 0′·05. The " ordinary " day inequalities are given in Table LXI*a*, and the corresponding ranges and non-cyclic changes in Tables LXIII and LXIII*a*. Comparing the monthly ranges from " ordinary " and " quiet " days it will be found that on the average of the 12 months the " ordinary " day range was the larger by 0′·51. The excess was not large except in March, May, June and December, and in February, July and October the " quiet " day range was the larger. Owing partly to the greater homogeneity of the " quiet " day data the difference between the ranges in the " ordinary " and " quiet " day diurnal inequalities for the whole year is only 0′·21.

A difference in type between the " ordinary " and " quiet " day inequalities can be recognised at all seasons, there being a markedly greater tendency on days that are sensibly disturbed for the extreme easterly declination to precede midnight. This is particularly true of the winter months. It will be observed that on all four winter months the minimum (or extreme easterly reading) appears before midnight in the " ordinary " day inequalities, whereas on the " quiet " days this is true only of December.

TERRESTRIAL MAGNETISM:—II. NOTES ON THE MAGNETIC OBSERVATIONS MADE AT THE VALENCIA OBSERVATORY, CAHIRCIVEEN, 1919. By L. H. G. DINES, M.A., A.M.I.C.E., Superintendent.

Absolute observations of declination, horizontal force and inclination were taken twice or more per month with the Dover unifilar, No. 139, and the Dover dip circle, No. 118, at the same hours of the day on each occasion. The mean times of observation were $10^h\ 20^m$ G.M.T. for the declination; $11^h\ 37^m$ for the horizontal force and $14^h\ 31^m$ for the inclination. In no case did the time of any individual observation differ from the mean by more than eight minutes.

Only such observations of each element have been used as were taken at times when that element, as recorded by the magnetographs at Kew Observatory, Richmond, was subject to no abnormal disturbance.

The deflections of the mirror magnet were taken at two distances of the collimator magnet, 30 and 40 cms., and a single "distribution constant," P, calculated from them. In each case 12 readings of deflection were taken for each complete observation in the manner described in the notes on the observations made in 1917.

The value of P was calculated for each month separately. This was done by first forming for every month the mean value u of the difference log m'H' at 30 and 40 cm. from all the available observations of deflection made in that month. Then a weighted mean q_0 based on the values of u for seven months was found by the formula

$$q_0 = \frac{4u_{-3}+7u_{-2}+9u_{-1}+10u_{-0}+9u_{+1}+7u_{+2}+4u_{+3}}{50}$$

where the suffix 0 refers to the month for which the value of P is required, -1 and $+1$ to those immediately preceding and following it, &c.

The appropriate correction to all the observations of horizontal force made in the month 0 was then determined from q_0.

The extreme variation during the year in the value of P determined by this method did not exceed the equivalent 3γ on the value of H.

The magnetic moment of the collimator magnet in use is somewhat low and is decreasing fairly steadily at the rate of three units per year. Its mean value in 1919 was 608·7. The mean value of P for the pair of magnets in use is about 7·2; the standard error of a single determination of it is approximately ·6 and has varied very little in amount for several years. Large though the error is, it has only been reduced to its present value by consistent careful attention to detail in the taking of observations and, with the existing magnets and magnetometer, can probably not be greatly improved on.

Particulars of the individual observations will be found in the monthly numbers of the *Geophysical Journal*, the values of horizontal force in which, were also based on the values of the distribution constant determined as above.

Table LXVII gives the observed mean monthly and annual values of declination, horizontal force and inclination, and corresponding calculated values of the total force and the north, west, and vertical components.

TERRESTRIAL MAGNETISM:—III. NOTES ON THE MANAGEMENT OF THE INSTRUMENTS AT ESKDALEMUIR AND ON THE CORRESPONDING TABLES, 1919.

By A. CRICHTON MITCHELL, D.Sc., F.R.S.E., Superintendent.

The magnetographs at Eskdalemuir are arranged so as to record changes in value of the three geographical components of terrestrial magnetic force, viz.: the north component, N (or +X); west component, W (or −Y), and the vertically downward component, V (or +Z).

The north and west magnetographs are of the Adie bifilar type. In these instruments, torsion of the bifilar suspension is used to bring the magnets into an azimuth approximately perpendicular to the direction of the components whose changes they respectively measure. During 1919 no change was made in the suspension. The vertical magnetograph was that lent by the late Professor Watson. The chief difficulty encountered with this instrument relates to the base line value, which is liable to sudden and large change if any considerable artificial movement is given to the pivoted magnet system or when the drying agent (calcium chloride) within the instrument case is changed. During 1919 there was no disturbance due to either of these causes. The air of the magnetograph room was less damp than in previous years and no renewal of the drier had to be effected. The only change made during the year was a slight alteration in the position of the control magnet on 8th April, 1919.

The magnetographs are installed in an underground house in which the diurnal change of temperature is negligible. Temperature is ascertained daily at $9^h\ 30^m$ by the thermometers within the instrument cases. The monthly means for the year, compared with the average for 1911–18 were as follows:—

Month.	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
				280° A +								
Average 1911–18	3·1	2·5	2·1	**1·9**	2·3	3·2	4·2	5·3	**6·0**	5·8	5·1	4·0
,, 1919	3·4	2·8	2·1	**1·7**	2·4	3·7	4·8	6·3	6·5	**6·9**	6·0	4·9

The annual range of temperature during the year was 5°·9 C, the mean for the previous eight years being 4°·5 C.

The constants of the magnetographs were as follows:—

	North.	West.	Vertical.
Time scale: 1 hour = ...	15·6 mm.	15·6 mm.	15·6 mm.
Time marks	Every two hours, ending at exact hour.		
Error of time mark	Not more than ± 1 min.		
Period of vibration, seconds	13·9	11·0	7·4
Logarithmic decrement	·345	·572	—
Angular equivalent of 1 mm. on paper, radians ..	·00032	·00032	·0003
Twist of bifilar suspension	35°	90°±5°	—
Ratio $\frac{\text{length of bifilar suspension}}{\text{mean breadth of suspension}}$	51	66	—
Temperature coefficient, per 1°	−9 γ	−2 γ	+ 26 γ
Direction of marked pole	West.	North.	—
Azimuth of magnet	270° 9′·5	0° 27′·7	346°

The scale values were determined twice monthly in the manner described in the 1913 Notes. The following values, obtained by overlapping means were employed in reducing the hourly readings.

Month.	North Instrument. γ per mm.	West Instrument. γ per mm.	Vertical Instrument. γ per mm.
January	4·98	5·36	4·09
February	4·95	5·35	4·05
March	4·94	5·35	4·05
April	4·96	5·36	4·00
May	4·93	5·35	4·01
June	4·92	5·31	3·99
July	4·93	5·29	3·97
August	4·89	5·32	3·97
September	4·89	5·31	3·97
October	4·90	5·32	3·96
November	4·90	5·33	3·97
December	4·89	5·31	3·98

Absolute observations were made weekly in the eastern magnetic hut. The results of these observations are given in the tables of auxiliary observations printed under each month along with the hourly values. Declination and horizontal force were determined on Pier No. 5 by the Elliot magnetometer, No. 60, and dip on Pier No. 6 by the Schulze Inductor, No. 103. In the deflection observations three distances, 25, 30, and 35 cm. were used. The value of the correction, $\log_{10}\left(1+\frac{P}{25^2}+\frac{Q}{25^4}\right)$ used in the reduction of the horizontal force observations was obtained for a given month by taking the mean for seven months including the given month as fourth of the seven. The values of this correction for the different months of the year were as follows :—

January, ·00516; February, ·00516; March, ·00529; April, ·00550; May, ·00552; June, ·00570; July, ·00581; August, ·00603; September, ·00606; October, ·00593; November, ·00582; December, ·00572.

The preliminary base line values were then deduced from the results of the absolute observations, any of the latter obtained during times of considerable disturbance being excluded. The base line values finally adopted were obtained from a curve drawn smoothly through points given by the preliminary values.

The hourly readings are obtained from the magnetograms by means of a ruled glass scale. The reading for any given hour G.M.T. is that ordinate estimated to be the mean reading for 60 minutes centering at the given hour. The product of this ordinate and the scale value is added to the final base value, and the sum so obtained is the hourly value printed in the table. The mean value for the day is

$$\frac{S}{24}, \text{ where } \quad S=\frac{0+24}{2}+1+2+\ldots\ldots+23.$$

In calculating diurnal inequalities, the non-cyclic change has been eliminated on the assumption that its time-rate is linear. Inequality values are first calculated to 0·01 γ and then rounded off to 0·1γ. The inequalities in H, D, and I were computed from those of N, W, and V, by means of the formulæ—

$$\delta D = \frac{180 \times 60}{\pi} \left(\frac{\delta W \cos D - \delta N \sin D.}{H} \right)$$

$$\delta H = \delta N \cos D + \delta W \sin D.$$

$$\delta I = \frac{180 \times 60}{\pi} \cos I \left(\frac{\delta V \cos I - \delta H \sin I.}{H} \right)$$

in which δD, δI, are expressed in minutes of arc, and where H, D, and I for any month are the respective mean values for that month as published in Table LXVII.

The values of the harmonic coefficients were computed from the unrounded values of the inequalities. They were finally corrected where necessary, on account of the fact that the hourly values are not instantaneous values, but are mean values taken over an hour. The factor by which the coefficients have to be multiplied (*vide* B.A. Report, 1883, p. 98) is 1·00286 for a_1, b_1, c_1; 1·01152 for a_2, b_2, c_2; 1·02617 for a_3, b_3, c_3; and 1·04720 for a_4, b_4, c_4.

TERRESTRIAL MAGNETISM :—IV. REVIEW OF RESULTS OF MAGNETIC OBSERVATIONS AT ESKDALEMUIR DURING 1919. By A. CRICHTON MITCHELL, D.Sc., F.R.S.E., Superintendent.

1. The following account summarises the principal results of the magnetic observations made during 1919.

Reference may be made to the *Notes on the Management of the Magnetic Instruments* in this and previous issues of the *Year Book* for details regarding the instruments employed and the manner in which the values of the elements are deduced from the magnetograms.

2. *Mean Annual Values of the Magnetic Elements*, 1919.—These, together with the corresponding values for the previous year, are given in Table I. The values of N, W, and V have been computed from the hourly values derived from the autographic records, standardized by means of absolute observations. Those of H, D, I, and T have been deduced from the values of N, W, and V.

Table I.

Year.	H.	D. (West)	I.	N.	W.	V.	T.
	γ	° ′	° ′	γ	γ	γ	γ
1918 ..	16715	17 8·1	69 39·0	15973	4925	45067	48067
1919 ..	16713	16 58·7	69 39·6	15985	4880	45084	48082

The fall in H, which began in 1912, continued, but its rate was again slower, and, indeed, almost negligible. Declination was lower by 9′·4, a rate slightly higher than the mean of the last ten years. Inclination is still rising slowly from the minimum of 1914. The north component was higher than in the previous year, during which it appears to have reached a minimum. Total intensity appears to have passed through a similar minimum in 1918, and to be rising again after a fall which had been in progress since 1912.

The extreme values of N, W, and V recorded during the year are given in Table II. The sign > or < indicates that the trace exceeded the limits of registration.

Table II.

Component.	Maximum.		Minimum.		Absolute Annual Range.
	Value.	Date 1919.	Value.	Date 1919.	
	γ	h m	γ	h m	γ
North	16336	5 Oct. 16 54	<15627	12 Aug. 1 48 to 2 10	>709
West	5173	5 Oct. 16 52	4591	1 Oct. 23 27	582
Vertical..	>45415	5 Oct. 16 53 to 17 28	<44830	3 May 3 3 to 3 18	>585

The absolute annual ranges were larger than those of the previous year, but less than those recorded in 1917.

3. *Magnetic Character of the Year.*—The magnetic character at a given station for a given year, season, month, or day is understood to be an estimate of the extent or frequency of departure from normal conditions. It is not a quantity which has as yet been defined in a manner which leads to exact numerical expression, although several attempts in this direction have been made in recent years. In addition to the assignment of " character figures " according to the well-known international method, it has been the practice at Eskdalemuir to tabulate two other quantities

for each day. The first of these is ΣR^2, the sum of the squares of the absolute daily ranges of the three geographical components.* The second is the mean of the 24-hourly values of Σr^2, the sum of squares of the hourly ranges of the three geographical components.* The character figures assigned to each day of 1919 under the international scheme are shown in the fourth table under each month in this volume, and need not therefore be repeated. The daily values of ΣR^2 and the daily means of Σr^2 are given in the subjoined Tables III and IV respectively. The mean monthly values of the squares of the absolute daily ranges are shewn above in Table LXIII*b*‡.

TABLE III.

1919	Values of ΣR^2.											
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	γ^2	γ^2	γ^2	γ^2	γ^2	γ^2	γ^2	γ^2	γ^2	γ^2	γ^2	γ^2
1	2426	36479	81105	30875	18458	22794	25883	34350	5651	696646	3362	3829
2	1633	50651	85969	10885	205298	19169	17818	19766	153429	258797	3853	2734
3	151233	15874	47057	12131	276522	16280	22091	14282	56430	115598	3300	12350
4	285386	26644	24942	19309	21753	17849	12741	18601	48905	217073	158169	7112
5	124277	24345	38174	8661	46170	18181	8480	17258	9203	489875	2913	5117
6	40838	13781	62948	52236	19718	13861	11521	7960	69430	71140	2097	4186
7	7786	1435	45075	91624	9963	13086	20105	12978	93392	21917	2004	2210
8	13907	4457	7046	88021	8224	9229	35565	22689	7493	27467	2505	16834
9	8306	11653	4233	33157	14452	41051	30794	12957	77945	42862	1866	4773
10	3665	4139	3957	24555	11194	54686	22866	10491	18666	17924	1285	6570
11	2038	1634	4586	13718	6198	36505	20333	773774	17880	10547	25906	5505
12	4181	2714	13562	21548	14969	35825	19141	421851	10389	10377	27422	10675
13	23609	81662	38505	12669	104153	23498	16475	6539	20565	8592	2721	12858
14	24046	38865	71922	9717	73774	14781	12518	10301	17062	7101	978	37013
15	10884	15654	12083	14458	25189	13910	8325	16917	21425	16686	6417	136577
16	91177	35786	21164	59107	29241	11934	10961	20005	23747	53924	52259	4609
17	44001	..	35455	137146	53990	16570	96386	17441	15465	52638	39446	982
18	84734	9387	6861	85001	36155	11453	25526	21965	23189	30897	28186	18002
19	41898	4395	78833	32754	26725	7766	12804	100745	536706	9138	2131	15565
20	17813	8577	..	29339	37290	8036	15081	24725	214650	6138	1830	22977
21	14553	167069	..	28381	101524	11424	7581	10766	50585	5822	16819	25164
22	15761	65022	115785	44466	72641	16848	42600	10550	15753	17522	30990	28517
23	7427	84005	40190	22779	31634	29781	98305	23306	25889	37726	10494	11893
24	7966	10349	6083	18365	133129	33865	22878	9162	135852	5134	6346	32745
25	2913	3617	22334	5886	36486	39946	11371	14539	44246	5485	3730	4979
26	3225	7646	15186	7213	68605	20765	..	29994	22113	32579	5563	1153
27	1864	74381	46165	8862	29757	21164	9230	12049	..	41670	933	2357
28	14241	93309	102929	6590	8349	14357	10260	30164	..	75792	2354	3042
29	21392	..	34001	20304	12306	17557	14787	24449	..	18878	1526	1316
30	4690	..	48855	17645	15698	13157	8422	9635	8363	22406	12593	2540
31	80853	..	31101	..	14356	..	15761	11261	..	14747	..	1203
Mean	37378	33094	39521	32247	50449	20844	22887	57144	64608	78809	15333	14367

* R_N, R_W, and R_V denoting the ranges for a calendar day of the north, west, and vertical components, ΣR^2 is written for $R_N^2 + R_W^2 + R_V^2$.

ΣR^2 determined thus is entered in Table III., and monthly means, such as $\frac{1}{31}\sum_{1}^{31}(\Sigma R^2)$, are given in Table V.

Similarly r_n, r_w, and r_v denoting hourly ranges, Σr^2 stands for $r_n^2 + r_w^2 + r_v^2$.

$\frac{1}{24}\sum_{1}^{24}(\Sigma r^2)$ is shown in Table IV., and monthly means such as $\frac{1}{31}\sum_{1}^{31}\left[\frac{1}{24}\sum_{1}^{24}(\Sigma r^2)\right]$ in Table V.

For other methods of estimating magnetic activity see *Activity of the Earth's Magnetism and Magnetic Characterisation of Days*, by G. van Dijk. Konink, Neder. Met. Inst. No. 102 (Utrecht, 1922).

‡ The entries in the column headed R_N^2 of Table LXIII*b* (p. 47) are the means of the daily values of R_N^2 for all

For Table III on the following days, March 28th, April 7th, May 3rd, August 11th, 12th, October 1st, 2nd, and 5th, the actual value of the range could not be determined owing to the trace "going off the sheet." In such cases the value at the edge of the sheet has been taken as the extreme value.

In Table IV the practice has been to omit from the daily mean any hour during which the trace was "off the sheet." In a few cases, however, when the time "off the sheet" was of short duration the value at the edge of the sheet has been taken as the extreme value.

TABLE IV.

	Mean Value of Σr^2.											
1919	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	γ^2	γ^2	γ^2	γ^2	γ^2	γ^2	γ^2	γ^2	γ^2	γ^2	γ^2	γ^2
1	184	3259	4538	1050	604	634	1044	1160	124	34965	124	142
2	75	4494	6467	262	11891	710	507	882	5372	5691	195	108
3	6651	1677	2958	238	13945	428	688	517	1917	5923	106	776
4	14741	2022	2128	665	923	344	401	672	1545	17432	6820	796
5	8338	1550	1304	166	2098	589	206	747	257	24918	152	452
6	3667	509	2599	1681	693	469	179	263	4709	7021	83	241
7	795	105	1715	7710	270	227	523	505	2876	1212	47	153
8	916	146	322	3371	150	177	1792	663	413	1148	105	775
9	403	570	167	1476	398	2338	1160	346	5224	2752	60	293
10	127	106	90	1371	370	2641	549	249	1008	550	113	289
11	65	57	327	360	116	1749	715	71894	768	584	1145	226
12	177	86	1419	621	548	1867	592	35585	271	298	1221	293
13	1595	3056	2372	440	7689	605	481	90	1828	249	83	688
14	1684	3350	3223	147	4007	262	354	143	874	162	35	3123
15	458	1326	473	382	1163	426	138	592	1002	798	203	10111
16	10004	2479	1076	2582	708	248	186	493	1275	2297	2468	343
17	4059	..	1398	9861	2593	542	3657	603	522	2707	2247	48
18	5376	..	142	3665	1491	410	1125	779	1321	1760	1584	417
19	4873	166	..	1591	844	158	403	6246	30015	419	78	747
20	1156	441	..	2251	6172	118	244	1289	7207	333	80	1112
21	1288	10813	..	1075	6833	261	189	285	2019	173	633	1613
22	1196	3697	6462	2006	3152	1002	1548	319	811	1281	1528	2458
23	593	3770	1773	1035	760	1035	5657	1025	1027	2053	568	499
24	243	519	140	1109	7321	800	922	403	9046	238	419	1728
25	133	120	878	319	1735	2057	335	681	2390	118	201	406
26	97	406	621	182	2799	788	427	1172	533	1472	282	59
27	50	3155	3018	476	1047	401	223	449	368	2464	47	109
28	423	8628	5315	239	192	637	174	1155	329	4676	82	120
29	1257	..	2373	713	291	521	466	578	319	809	114	43
30	244	..	2502	654	381	187	188	450	173	1038	239	137
31	4192	..	1649	..	434	..	320	240	..	534	..	68
Mean	2421	2173	2052	1590	2633	754	819	4209	2851	4067	702	915

The results of these three methods of estimating activity of the Earth's field may be gathered from Table V. in which they are compared.

days on which they have been actually obtained. Similarly for R_w^2 and R_v^2. The entries under $R_N^2 + R_w^2$ are the means of the daily values of these quantities for all days on which both have actually been obtained. Similarly for $R_N^2 + R_w^2 + R_v^2$. It may therefore happen that in any month when the value, e.g. of R_N^2 has not been obtained for a particular day, the entry in the fourth column may not be equal to the sum of the entries in the first and second columns, and similarly for $R_N^2 + R_w^2 + R_v^2$.

TABLE V.

Month.	Magnetic Character Figures.				Mean Value of ΣR^2.	Mean Value of Σr^2.
	No. of "0" Days.	No. of "1" Days.	No. of "2" Days.	Mean Character Figure.		
1919.					γ^2	γ^2
January	13	12	6	0·77	37378	2421
February	12	10	6	0·79	33094	2173
March	6	18	7	1·03	39521	2052
April	10	16	4	0·80	32247	1590
May	9	16	6	0·90	50449	2633
June	15	13	2	0·57	20844	754
July	16	13	2	0·55	22887	819
August	14	14	3	0·65	57144	4209
September	9	17	4	0·83	64608	2851
October	9	14	8	0·97	78809	4067
November	19	11	0	0·35	15333	702
December	14	16	1	0·58	14367	915
Year 1919	146	170	49	0·73	38844	2105
Year 1918 (364 days)	174	132	58	0·68	35282	1826

The foregoing table shows that all three methods point to an increased activity in terrestrial magnetic force during 1919 as compared with 1918. It is scarcely to be expected that the parallelism should be very close, for the limitations of the "character figure" scheme are well known, and, as is shown below, the relative importance of ΣR^2 and Σr^2 is different on days of different magnetic character. But it may be pointed out that the ratio of the 1919 to the 1918 yearly figures is 1·07 for the character figures, 1·10 for ΣR^2, and 1·15 for Σr^2.

The mean values of ΣR^2 and of the daily means of Σr^2 on days to which different magnetic character figures have been assigned are shown below in Table VI. This table shows that the means for the three classes of day are sharply distinguished from each other.

TABLE VI.

Month.	"0" Days.		"1" Days.		"2" Days.	
	ΣR^2.	Σr^2.	ΣR^2.	Σr^2.	ΣR^2.	Σr^2.
1919.	γ^2	γ^2	γ^2	γ^2	γ^2	γ^2
January	4471	246	23579	1881	136277	8217
February	5617	214	26630	2125	94241	5520
March	5912	196	35977	1860	92924	5696
April	10416	309	30131	1250	100385	6101
May	11193	289	39006	1921	139844	8047
June	12252	329	24688	979	47868	2490
July	11613	285	25209	886	97345	4657
August	12079	344	21857	852	432123	37908
September	9694	348	37978	1810	260159	12910
October	7764	286	34299	1716	270685	12434
November	3153	117	35461	1712	..	..
December	3029	145	16651	1014	136577	10112
Mean 1919	8099	253	29289	1495	164403	10385
„ 1918	10465	344	29956	1494	119011	6597
„ 1917	9796	..	21751	..	168806	..
„ 1916	9262	..	23006	..	111444	..

If the values of ΣR^2 on individual days are used as the test of magnetic character and the five days of lowest value in each month are selected they agree in 40 cases out of 60 with the days selected at De Bilt. If the values of Σr^2 are used the number of agreements with De Bilt quiet days rises to 52.

The selection of the five highly disturbed days each month is perhaps an easier matter. The two criteria ΣR^2 and Σr^2 give respectively 43 and 47 disturbed days identical with those selected at De Bilt.

With regard to the extent of agreement between the results derived from tabulating ΣR^2 and Σr^2, it must be pointed out that the ratio of ΣR^2 to the mean value of Σr^2 varies with the season of the year and with the character of the day. Table VII. shows this quite clearly.

TABLE VII.—*Monthly Means of Daily Values of* $\dfrac{R_N^2 + R_W^2 + R_V^2}{\frac{1}{24}\sum_1^{24}(r_n^2 + r_w^2 + r_v^2)}$

Month.	All Days.	"0" Days.	"1" Days.	"2" Days.
1919.				
January	19·2	22·8	15·8	17·0
February	19·7	25·6	14·0	19·4
March	22·9	34·2	20·4	16·6
April	29·1	37·8	26·2	18·8
May	28·7	41·2	25·2	21·2
June	37·0	45·8	31·6	19·0
July	37·3	46·8	29·8	22·0
August	30·8	39·4	26·2	13·0
September	25·6	34·4	23·2	22·8
October	24·9	31·0	21·8	23·6
November	23·9	26·4	19·6	..
December	20·0	21·6	19·0	13·6
Year 1919..	26·6	34·0	22·8	18·8

4. *Diurnal Inequalities.* Following the practice adopted since 1915, diurnal inequalities for 1919 have been calculated for (1) five international quiet days, (2) five selected disturbed days, and (3) all days, in each month. The details for each are given in Tables XLIX. to LX*f*.

For quiet days the diurnal inequality ranges of all components show decreases in all seasons as compared with 1918, except that there was a slight increase in the values of those of the vertical component in the equinoctial months of 1919. In August, 1919, the vertical inequality range was much larger than usual.

For selected disturbed days the inequality ranges of all components were greater than those of any year since 1915, and this should be noted in connection with the position of the year in the sunspot cycle. There was, however, a notable falling off in the last two months of the year, and, in consequence, the means of the winter months in all three components are below those of the previous year.

The inequality ranges for "all days" showed no particularly noteworthy feature.

5. *Harmonic Coefficients.* The coefficients in the harmonic series expressing the diurnal inequalities for quiet days showed little change compared with those of the previous year, the tendency being generally towards lower values of the amplitudes. For disturbed days the amplitudes in the principal term of the expansion of the mean yearly inequality showed increases for all three components as compared with 1918. Phase angles showed little change. The values of c_1 and c_2 for the vertical component during the equinoctial months were unusually large. For "all days" the amplitudes of the two principal terms decreased in nearly all cases, while phase angles retained nearly the same values.

The harmonic analysis of inequalities obtained for five international quiet days and for five selected disturbed days in each month has now been worked for each year since 1916. Short as this period is, the results are sufficient to indicate the general

character of the relation which exists between disturbance and the phase angles. If for each component and for each season the values of the phase angles for the 24 and 12-hour waves be obtained, and the difference (disturbed-day angle *minus* quiet-day angle) be taken, the following results are noticed; where the difference is positive, there is an acceleration of phase accompanying disturbance :

(*a*) In all three components the difference for the 24 hour term in the yearly inequality is positive, and amounts to 36° for N, 38° for W, and 83° for V.

(*b*) The difference for the 24-hour term in the winter inequality is small or negative for N, positive (38°) for W, and positive (22°) for V.

(*c*) The difference for the same term in the equinox and summer months is positive for all components, being most noticeable (98° equinox, 95° summer) in V.

(*d*) The differences for the 12-hour term are, generally, smaller in amount, and are positive for N, negative for W, and (except in winter) negative for V.

The annual inequalities for international quiet days and selected disturbed days are shown in Plates II and III, the latter being in the form of vector diagrams. The former indicates the presence of " accidental " features to a greater degree than usual in the disturbed-day inequalities. But this is very probably due to the difficulty of reading magnetograms during times of very large disturbance, e.g., the storm of August 11th–12th, 1919. The vector diagrams for disturbed days show several differences when compared with the corresponding diagrams for quieter years. For example, the N, V diagram for 1915 and 1916 does not show the loop at 17h.–19h. On the other hand, the loop during the early morning hours is less pronounced in quieter years. Again, in the prime vertical plane, the diagram for more disturbed years shows a narrower loop in the early morning hours.

6. *Daily Range.*—The mean absolute daily range for each month of the year compared with the corresponding means for 1911–18 are given in Table VIII. The ranges are also expressed as percentages of the mean absolute daily range for the year.

* TABLE VIII.—*Absolute Daily Range. Mean Monthly Values.*

Month	Mean Absolute Daily Range.						Mean Daily Range expressed as Percentage of Yearly Mean.					
	1919.			Mean, 1911–18.			1919.			Mean, 1911–18.		
	N.	W.	V.	N.	W.	V.	N.	W.	V.	N.	W.	V.
	γ	γ	γ	γ	γ	γ	%	%	%	%	%	%
January . .	96	100	61	56	59	33	93	100	94	73	80	72
February . .	96	100	61	60	64	36	93	100	94	78	86	78
March . . .	122	117	80	76	79	49	119	117	123	99	107	107
April . . .	106	97	69	89	81	56	103	97	106	116	109	122
May . . .	132	110	91	84	73	46	128	110	140	109	99	100
June . . .	90	96	44	83	79	42	87	96	68	108	107	91
July . . .	94	92	43	83	78	46	91	92	66	108	105	100
August . . .	117	107	67	97	86	63	114	107	103	126	116	137
September . .	127	119	103	84	78	47	123	119	158	109	105	102
October . .	141	130	91	82	82	55	137	130	140	107	111	119
November . .	55	66	35	67	66	39	53	66	54	87	90	85
December . .	63	67	33	57	61	37	61	67	51	74	82	80
Winter . . .	78	83	48	60	62	36	76	83	74	78	84	78
Equinox . .	124	116	86	83	80	52	120	116	132	108	108	113
Summer . .	108	101	61	87	79	50	105	101	94	113	107	109
Year . . .	103	100	65	77	74	46	..	..	..	..	..	..

* In some cases the data contained in this table differ from those published in *Hourly Values from Autographic Records, 1918*, Table IX, page 70, and the table on page 110 of *Geophysical Journal, 1919*; in these cases the data given here are corrected values.

As a general result, the ranges during the winter months of 1919 were smaller than those of the previous year. In the equinoctial and summer months they were larger. The large values for the mean range in V during May and September, 1919, may be noted. The leading instances of large daily range are shown in Table X.

The quietest days of each month of the year were January 2nd, February 7th, March 10th, April 25th, May 11th, June 19th, July 21st, August 13th (immediately following the largest storm), September 29th, October 24th, November 27th, December 17th, the second last of these being the quietest day of the year, with ranges of 20γ, 22γ, and 7γ in N, W, and V respectively. These ranges are about twice as large as the lowest ranges in a quiet year such as 1913.

The frequency distribution of ranges recorded during the year, according to different amounts, is given in Table IX.

TABLE IX.—*Frequency Distribution of Absolute Range.*

Range γ	No. of Cases, 1919.			Percentage Distribution.					
				North.		West.		Vertical.	
	N.	W.	V.	1919.	1911–18.	1919.	1911–18.	1919.	1911–18.
0–9	0	0	16	0·0	0·1	0·0	0·1	4·4	6·3
10–19	2	0	45	0·6	3·6	0·0	2·7	12·5	19·8
20–29	16	11	75	4·4	6·1	3·0	5·9	20·8	24·3
30–39	19	24	51	5·2	8·4	6·7	7·9	14·1	14·6
40–49	18	29	32	5·0	11·5	8·0	12·9	8·9	8·9
50–59	26	19	14	7·2	14·1	5·3	14·6	3·9	5·3
60–69	52	28	17	14·3	12·6	7·8	13·7	4·7	4·6
70–79	34	43	27	9·4	9·1	11·9	11·0	7·5	2·8
80–89	29	38	9	8·0	7·7	10·5	7·8	2·5	2·7
90–99	24	24	6	6·6	5·6	6·7	6·0	1·7	2·2
100–109	21	31	4	5·8	5·1	8·6	4·2	1·1	1·2
110–119	33	24	7	9·1	3·2	6·7	2·6	1·9	1·0
120–129	13	16	12	3·6	2·6	4·4	1·9	3·3	0·4
130–139	15	12	7	4·1	2·4	3·3	1·6	1·9	0·7
140–149 .. .	9	13	5	2·4	1·2	3·6	1·9	1·4	0·5
150–159	5	4	4	1·4	1·1	1·1	0·9	1·1	0·6
160–169	8	7	4	2·2	0·9	1·9	0·6	1·1	0·3
170–179	3	7	2	0·8	0·7	1·9	0·8	0·6	0·5
180–189	5	2	4	1·4	0·8	0·6	0·6	1·1	0·4
190–199	0	10	1	0·0	0·5	2·8	0·3	0·3	0·4
200 and above ..	31	19	19	8·5	2·7	5·3	2·0	5·3	2·4
Days omitted ..	2	4	4	..	..	..	..	..	..

The frequency of days of considerable disturbance, i.e., of days with a range of either horizontal component of 160γ or more, during 1919, was greater than that of 1918 by about 20 per cent.

7. *Principal Magnetic Storms during* 1919.—Table X gives particulars of the principal magnetic disturbances recorded during the year. The magnetograms for disturbed days are not published in this volume, but photographic copies may be obtained on application to the Director, Meteorological Office, Air Ministry, Kingsway, London, W.C.2.

TABLE X.—*Principal Magnetic Disturbances Recorded at Eskdalemuir*, 1919.

Where the beginning of a disturbance has been marked by a "sudden commencement," the serial number is followed by an asterisk (*), and the time entered in the second column is that of the sudden commencement, estimated to the nearest minute. In other cases, the exact hour nearest the time at which disturbance may be regarded as having begun is entered in the second column. To the tabulated values of maximum and minimum the following have to be added :—

N, 15000γ ; W, 4000γ ; V, 44000γ.

No.	From.	To.	North Component.					West Component.					Vertical Component.				
			Max.	Time.	Min.	Time.	Range.	Max.	Time.	Min.	Time.	Range.	Max.	Time.	Min.	Time.	Range.
	d h m	d h	γ	d h m	γ	d h m	γ	γ	d h m	γ	d h m	γ	γ	d h m	γ	d h m	
1*	Jan. 3 18 14	Jan. 6 24	1145	3 20 27	846	5 3 14	299	972	4 13 18	653	4 19 33	319	1321	4 19 20	1001	4 23 27	320
2	,, 16 7	,, 19 24	1049	18 19 36	845	16 21 34	204	953	16 13 37	728	16 21 40	225	1186	18 17 25	1025	17 3 54	161
3*	,, 31 10 45	Feb. 2 24	1041	31 21 49	893	1 2 20 to 2 10 43	148	963	31 13 12	724	31 19 18	239	1134	2 16 50	1028	1 2 59	106
4	Feb. 13 16	,, 16 21	1089	13 21 56	893	16 16 34	196	990	13 18 30	781	14 18 15	209	1183	13 18 52	1040	14 1 26	143
5	,, 21 0	,, 24 3	1122	21 17 23	883	23 13 34	239	956	23 12 55	700	21 19 34	256	1240	21 19 30	1009	22 0 18	231
6	,, 27 19	Mar. 7 2	1109	2 18 52	854	28 3 21	255	983	27 21 21	760	6 0 30	223	1229	27 21 40	953	7 0 51	270
7	Mar. 19 14	,, 23 24	1111	21 17 54	809	20 22 37	302	974	20 14 13	699	20 22 11	275	..	..	..	..	..
8*	Apr. 6 7 55	Apr. 10 24	1106	7 23 13	872	8 10 55	234	947	6 13 49	753	6 23 46	194	1116	10 19 20	890	8 2 17	226
9	,, 16 12	,, 23 5	1095	17 19 24	852	17 9 27	243	981	16 14 28	779	17 20 45	202	1192	17 16 51	941	18 4 25	251
10*	May 1 22 56	May 6 24	1110	2 17 9	765	3 9 5	345	1014	2 14 11	693	3 3 20	321	1267	2 17 3	<830	3 3 3 to 3 3 18	>437
11	,, 13 4	,, 15 6	1117	13 17 40	889	13 5 3 to 14 10 3	228	961	13 5 20 to 13 15 36	789	14 1 25	172	1122	13 18 10	949	14 1 27	173
12	,, 24 4	,, 25 1	1176	24 16 27	903	25 0 17	273	983	24 16 30	824	24 22 0	159	1216	24 16 36	1018	24 5 8	198
13*	July 17 5 18	July 18 6	1146	17 16 37	977	17 13 33	169	1037	17 16 46	835	18 5 22	202	1261	17 17 34	1065	18 2 12	196
14*	Aug. 11 6 58	Aug. 12 20	1242	11 16 46	<627	12 1 48 to 12 2 10	>615	1098	11 16 48	649	12 2 1	449	>1344	11 15 30 to 11 16 30	<845	11 23 22 to 11 23 32	>499
15*	,, 18 20 56	,, 20 8	1103	19 20 20	862	19 12 55	241	954	19 3 52	812	19 0 16	142	1169	19 18 8	1019	19 4 39	150
16*	Sep. 2 12 22	Sep. 4 8	1165	2 21 2	909	2 23 10	256	940	2 17 17	738	2 20 52	202	1183	2 20 50	966	2 23 35	217
17*	,, 18 0 9	,, 21 8	1225	19 17 23	754	19 21 54	471	988	19 17 48	661	19 19 53	327	1313	19 16 44	839	20 0 50	474
18*	Oct. 1 16 12	Oct. 2 6	1193	1 22 13	<634	1 23 to 40 1 24 0	>559	1089	1 22 13	591	1 23 27	498	1310	*	913	2 0 27	397
19*	,, 4 4 31	,, 6 24	1336	5 16 54	795	4 21 56	541	1173	5 16 52	759	4 21 28	414	71415	5 16 53 to 5 17 28	1000	6 3 41	>415
20*	Nov. 4 9 20	Nov. 4 20	1082	4 17 25	913	4 17 49	169	1036	4 16 35	834	4 18 34	202	1350	4 17 25	1052	4 11 40	298
21	Dec. 12 23	Dec. 15 24	1032	12 23 2	729	15 9 27	303	948	14 16 4	750	15 21 6	198	1174	15 17 37	1036	15 8 4	138

* For details, see *Geophysical Journal*, October, 1919. Table VI, p. 79.

ATMOSPHERIC ELECTRICITY :—NOTES ON THE TABLES OF POTENTIAL GRADIENT.

At both Kew and Eskdalemuir Observatories potential gradient is determined by means of the Kelvin water-dropping apparatus.

The method of standardizing the records so as to give potential gradient in the open is explained in *Hourly Values*, 1916.

The factors used in the reduction are shown month by month in the *Geophysical Journal*, Tables V and VI, where gradient values for four hours a day are set out.

The data utilised in the preparation of the tables (page 51) are mean values for periods of 60 minutes centered at the hours of Greenwich Mean Time. Means for the selected days of each month are found and from these the mean for the month (given in the last column of the tables) is computed. The departures from this mean are corrected for the non-cyclic change before being entered in the appropriate table.

The electrograph at Kew Observatory was moved from the main building at the end of May, 1915. A discussion of the effects of this removal will be found in *Hourly Values*, 1916. The method of testing the insulation of the electrograph at Eskdalemuir is described in *Hourly Values*, 1917.

For Kew Observatory (Table A) the inequalities and the mean Monthly and Annual Values are based on the curves of quiet days, selected from those entirely free from negative potential. Other objects in the selection of quiet days are freedom from large irregular movements, absence of indications of inferior insulation in the electrograph, and the avoidance so far as possible of large non-cyclic changes. The selected quiet days numbered 10 in each month. To obtain this number, however, in January, February, November and December it was necessary to take as " days " several periods of 24 hours which did not commence at midnight.

In such cases appropriate allowance was made for the non-cyclic changes but there is no entry in the column headed 24–0.

Tables B and C give the corresponding inequalities for Eskdalemuir, the former table for 0a days : the latter for 1a and 2a days combined. The explanation of these symbols is as follows :—

0, denotes a day during which from midnight to midnight no negative potential was recorded.

1, denotes one or more excursions of limited duration to the negative side of the scale.

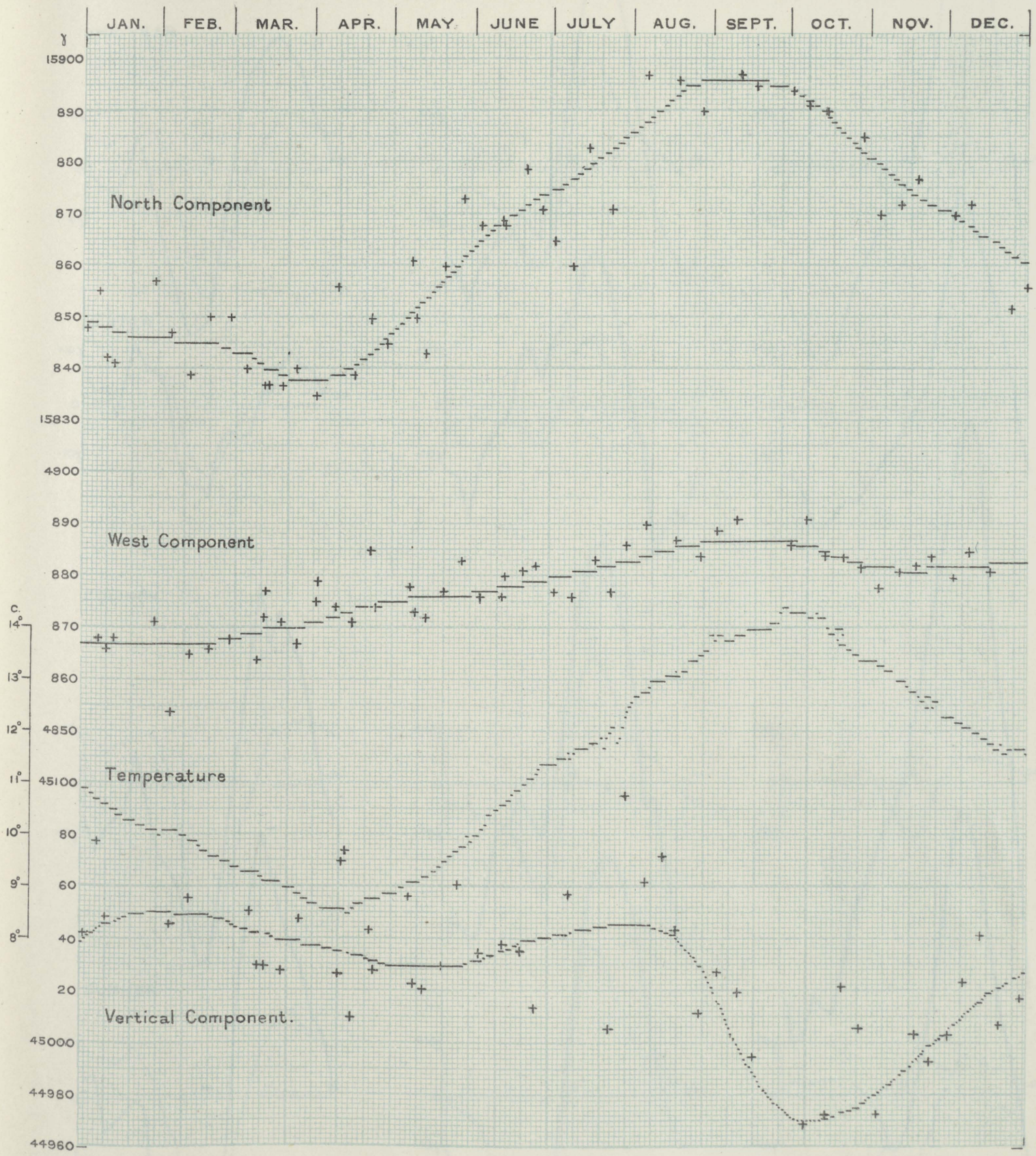
2, denotes negative potential extending in the aggregate over 3 hours or more.

" a," denotes that within the 25 periods of 60 minutes for which an estimate of the mean potential gradient has to be made in the process of tabulation there was in no case a range of potential gradient in the open exceeding 1000 volts.

In forming these inequalities for Eskdalemuir, only those days were used on which all the 24 hours were available. The number of days employed in the several months in these two tables is specified, being highly variable.

Plate I.

ESKDALEMUIR MAGNETOGRAPHS: BASE VALUES 1919.



H.M. Stationery Office Press, Kingsway W.C.2.

Ps. 3737/307. Wt. 109. D.S.O.P. 613/775. 375. 10/22.

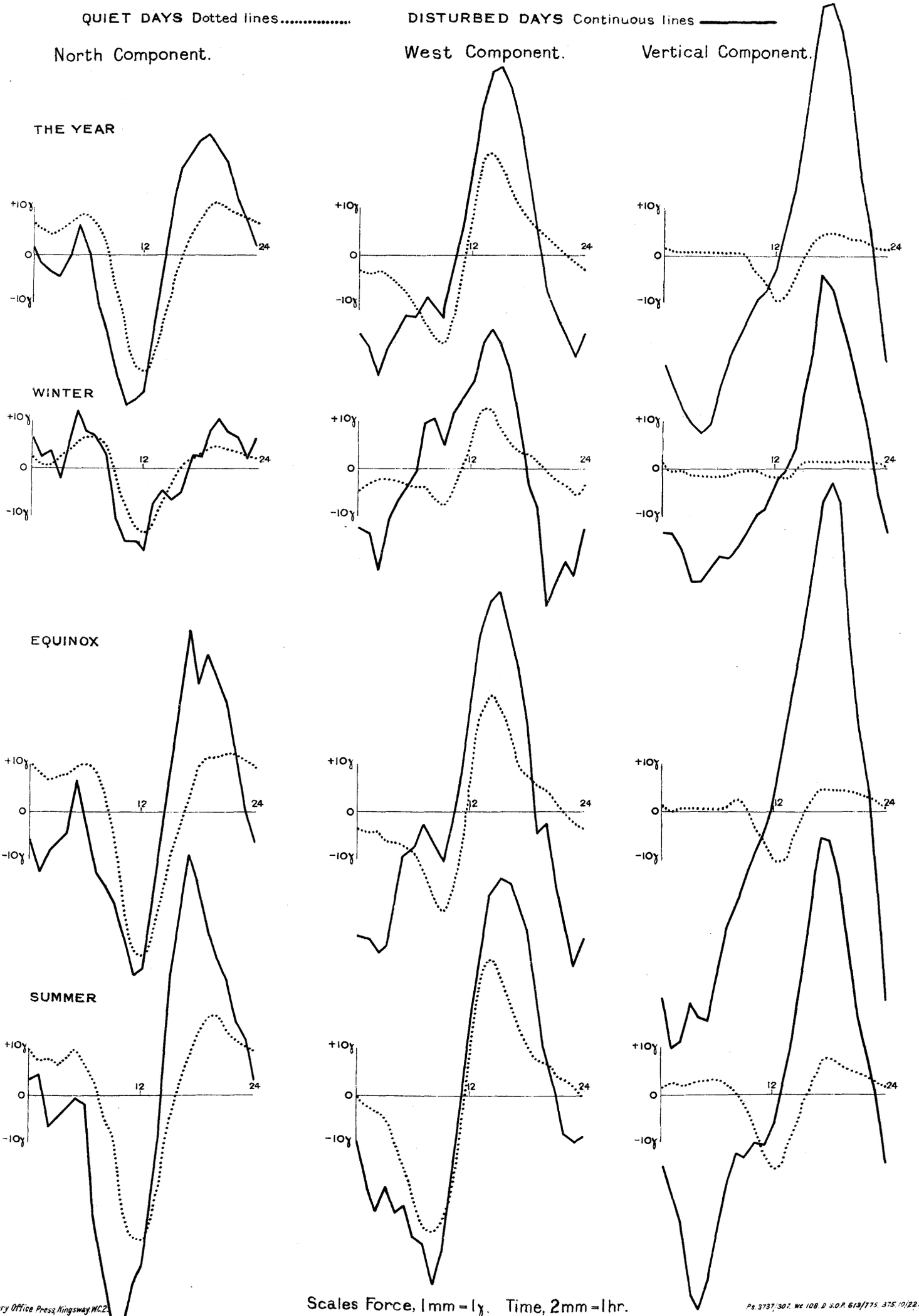
geophysical elements at three observatories of t

Plate II.

Diurnal Variation in the Components of Magnetic Force on Quiet and Disturbed Days, Eskdalemuir 1919.

(The Year and the Seasons.)

QUIET DAYS Dotted lines..... DISTURBED DAYS Continuous lines ——————



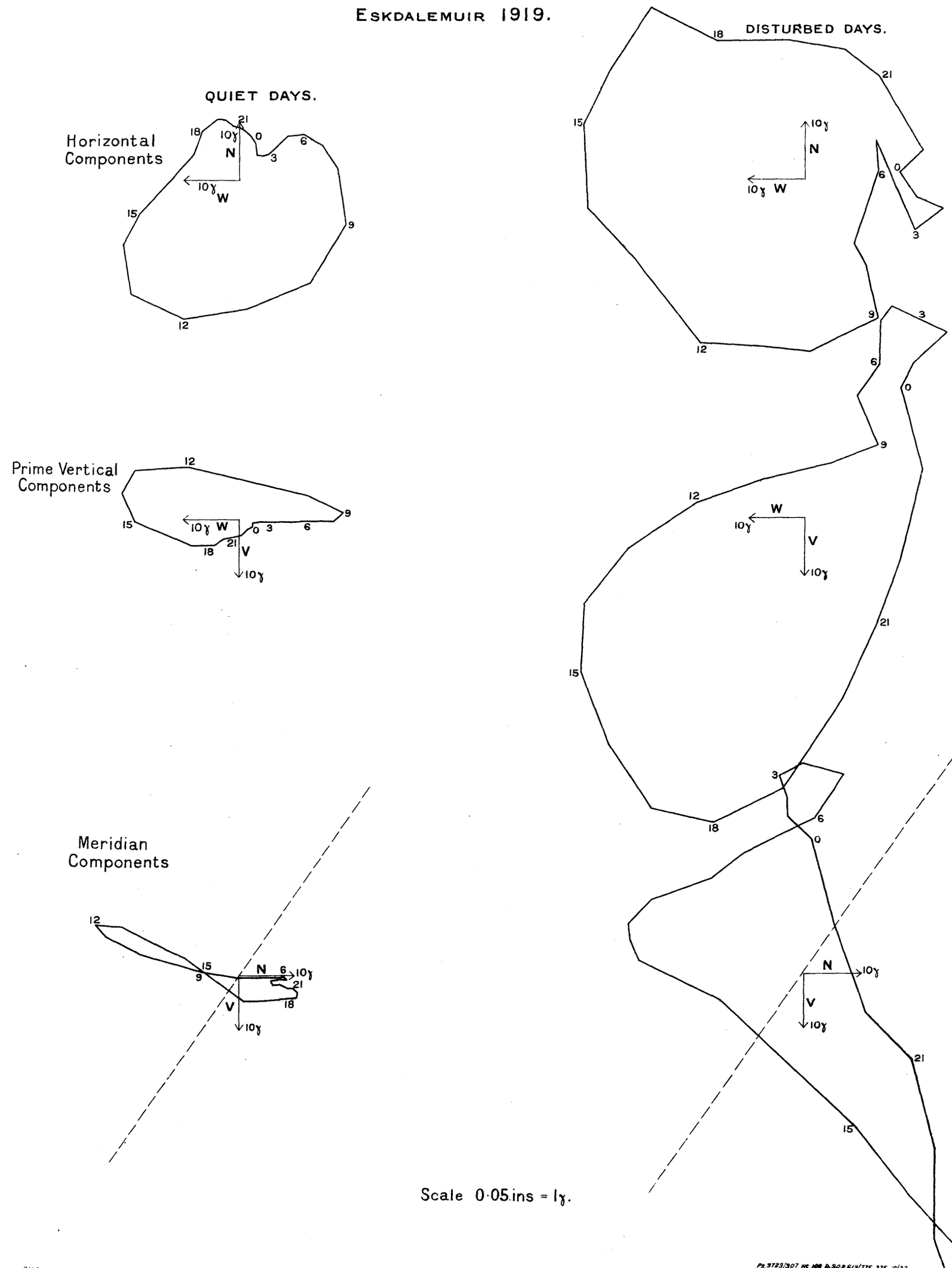
Scales Force, 1mm = 1γ. Time, 2mm = 1hr.

H.M. Stationery Office Press, Kingsway W.C.2.

Ps. 3737/307. We 108. D. S.O.P. 613/775. 375. 10/22.

Plate III.

VECTOR DIAGRAMS ILLUSTRATING DIURNAL VARIATION IN MAGNETIC FORCE ON QUIET DAYS AND DISTURBED DAYS. ESKDALEMUIR 1919.



H.M. Stationery Office Press, Kingsway, W.C.2.

Ps. 3725/307 Wt. 488 D.S.O.A. 613/775. 375 :0/22.