balanced by that of sodium at the temperature of the flame of cyanogen burning in air, but is sensibly less than that of sodium, at the temperature of a jet of coal-gas and oxygen, much less than that of sodium in the oxyhydrogen jet. This seems to render it probable that the temperature of the incandescent thread is not far different from that of a cyanogen flame burning in air (or rather the temperature it conveys to the sodium in it), but is less than that of an oxyhydrogen flame, though this does not necessarily follow from the experiments, inasmuch as the radiation of the sodium is so much more limited as to range than that of the carbon. When a Bunsen burner or a gas blowpipe flame was interposed between the lens and slit, no reversal of the hydrocarbon bands could be seen. When magnesium was burnt between the lens and slit, the magnesium lines (*b*) were seen bright, eclipsing the carbon. Possibly the smoke of magnesia may have considerably helped to eclipse the light of the carbon.

IV. "Preliminary Report to the Solar Physics Committee on a Comparison for Two Years between the Diurnal Ranges of Magnetic Declination as recorded at the Kew Observatory, and the Diurnal Ranges of Atmospheric Temperature as recorded at the Observatories of Stonyhurst, Kew, and Falmouth." By BALFOUR STEWART, LL.D., F.R.S., Professor of Physics at Owens College, Manchester. Communicated to the Royal Society by permission of the Solar Physics Committee. Received January 25, 1882.

1. In a paper communicated to this Society, and published in its "Proceedings" (vol. 32, p. 406), evidence was brought forward tending to show that what may be termed declination-range weather takes 1·6 days to pass from Toronto to Kew; that is, the same phase occurs 1·6 days later at Kew than at Toronto. And in a previous paper (*op. cit.*, vol. 29, p. 308) evidence was brought forward tending to show that temperature-range weather takes about 8 days to pass between these two places.

In this last-mentioned paper an attempt was likewise made to show that there is a similarity between magnetical and meteorological changes, and that both are due to the sun. This result has been confirmed by subsequent discussion, and there seems reason to suppose that in America both magnetical and meteorological changes follow very quickly after the solar changes which produce them.

If this be true, if the two kinds of allied weather start together at America, or nearly together, and if the magnetical moves in the same direction as the meteorological weather, but only quicker than it, then it is not unreasonable to suppose that the Kew magnetical weather of to-day may be found to resemble the Kew meteorological weather six or seven days later on.

It is this point which I have endeavoured to test in the present communication by comparing together the variations of declination-range and those of temperature-range at Kew during the years 1871 and 1872.

2. Bearing in mind, however, the local nature of meteorological phenomena, instead of confining myself to Kew alone, I have taken the means of the daily temperature-ranges at Stonyhurst, Kew, and Falmouth, these three forming the chief stations in England of the Meteorological Council, to whose kindness I am indebted for a list of the daily temperature-ranges at these three places for the years 1871 and 1872.

These mean ranges have been compared with the corresponding Kew declination-ranges, excluding disturbances, for which I am indebted to the kindness of the Kew Committee. This comparison has been made after the following method :—

3. The meteorological material, as already mentioned, consists of a series of the daily temperature-ranges at Stonyhurst, Kew, and Falmouth, recorded in degrees Fahrenheit and tenths of a degree. As the results are merely comparative, decimal points have been omitted; also, instead of taking means of the daily temperature-ranges at these three places, it has only been deemed necessary to record the sums of these ranges, thereby saving the division by *three* for each day. A specimen of these sums is exhibited in Table I, column 2. Furthermore, in order somewhat to equalise or tone down individual fluctuations, daily sums of four of the numbers of column 2 are recorded in column 3.

Again, as it is fluctuations of small period, say twenty-four or twenty-five days, which we wish to investigate, column 4 is made to contain means of twenty-five of the numbers of column 3, this mean being placed opposite to that number of column 3 which has the middle or thirteenth place in the series of twenty-five. Finally, the differences between corresponding numbers of columns 3 and 4 are exhibited in column 5, these being taken to represent the fluctuations we are in search of, the sign *minus* denoting defect, and the sign *plus* excess, in the observed values of column 3 with reference to the mean or normal values of column 4.

4. These various peculiarities of the method will be perceived from the following table :—

Table I.—Exhibiting the method of forming a series of Fluctuations of Temperature-Range.

Col. 1. Date. 1872.	Col. 2. Sums of ranges F+K+S.	Col. 3. Sums of 4 values of Col. 2.*	Col. 4. Means of 25 values of Col. 3.	Col. 5. Differences, Col. 3, Col. 4.
January 1.....	244			
" 2.....	185	963		
" 3.....	263	1028		
" 4.....	271	1082		
" 5.....	309	1040		
" 6.....	239	984		
" 7.....	221	908		
" 8.....	215	958		
" 9.....	233	1089		
" 10	289	1154		
" 11.....	352	1200		
" 12.....	280	1158		
" 13.....	279	1110		
" 14.....	247	1091	993	+ 98
" 15.....	304	1131	986	+145
" 16.....	261	1132	975	+157
" 17.....	319	1110	963	+147
" 18.....	248	1038		
" 19.....	282	981		
" 20.....	189	944		
" 21.....	262	857		
" 22.....	211	905		
" 23.....	195	813		
" 24.....	237	744		
" 25.....	170	728		
" 26.....	142	686		
" 27.....	179	768		
" 28.....	195	757		
" 29.....	252	787		
" 30.....	131			
" 31.....	209			

5. The numbers representing the diurnal ranges of declination at Kew are derived by means of a measuring instrument applied to the magnetograph curves, and are recorded in decimals of an inch. As the results are merely comparative, decimal points have been omitted. These numbers have been treated in the same way in which the numbers in column 2 of the above table are treated; in fine, the temperature and declination-ranges have had applied to them precisely the same method of treatment.

Ultimately we obtain, as in the case of the temperature-ranges, a column representing declination fluctuations, and comparable with column 5.

6. In Table II the temperature-range and declination-range fluctuations are exhibited side by side for the various months of the years 1871 and 1872.

Table II.—Comparison of Declination-range and Temperature-range Fluctuations for the Year 1871.

Day.	January.		February.		March.		April.		May.		June.	
	Dec.	Temp.	Dec.	Temp.	Dec.	Temp.	Dec.	Temp.	Dec.	Temp.	Dec.	Temp.
1	+ 43	− 31	+ 80	−242	+ 69	+367	−290	−420	−264	+ 70	+ 82	−138
2	− 49	−155	+267	−118	−102	+663	−224	−312	−330	+ 41	+ 41	− 85
3	− 78	− 53	+281	− 68	−157	+644	+114	−128	−221	+184	+174	− 83
4	−195	+ 54	+193	− 77	−161	+284	+ 82	− 50	−208	+206	+329	+ 27
5	− 66	+141	+284	− 27	−227	−148	+331	+153	−291	+252	+465	+ 19
6	− 23	+136	+ 43	− 12	− 33	−380	+373	+301	−471	+619	+499	− 8
7	+ 42	+ 34	+ 13	− 17	+ 11	−230	+271	+334	−545	+279	+477	− 81
8	− 3	+ 44	+ 35	+ 61	− 6	−112	− 13	+399	−640	+112	+335	+ 14
9	−151	− 22	− 87	+ 18	+ 14	− 7	+ 69	+437	−484	− 35	+269	+ 74
10	−233	− 26	−405	+139	− 50	− 75	+153	+307	−334	−222	+127	+217
11	−148	+164	−380	+223	+ 38	−278	+161	+188	−282	−206	− 42	+271
12	+ 95	+124	−260	+141	+222	−325	+295	+152	− 43	−209	− 60	+109
13	+113	+ 74	−282	+200	+397	−339	− 10	−124	+215	−167	− 83	− 2
14	+170	+150	+ 89	− 25	+502	−325	−422	−243	+467	−161	+ 61	−131
15	+117	− 96	+ 96	−103	+163	−125	−340	−234	+727	− 50	+106	−273
16	−131	− 64	− 33	− 59	+155	− 37	−306	−381	+678	+ 7	+ 79	−281
17	−102	− 2	− 65	−176	− 74	− 29	−279	−298	+616	− 30	− 99	−265
18	+ 15	+ 43	−132	−155	−151	+112	− 38	−246	+441	−163	−385	−218
19	− 32	+ 82	−146	−179	+ 35	+ 78	− 40	−244	+247	− 39	−386	−234
20	+ 88	+ 53	− 42	− 83	+ 16	+101	+163	−100	− 13	+ 78	−392	−251
21	+ 96	+ 30	+ 13	+ 40	− 33	+343	+346	−111	− 32	+117	−243	−297
22	− 19	− 90	+118	+ 48	−160	+512	+437	− 98	−298	+412	−229	−330
23	−115	−122	+186	+ 29	− 99	+650	+353	− 61	−809	+343	− 40	−179
24	−218	− 83	+141	− 31	− 82	+643	+ 84	− 31	−568	+129	+ 6	+ 53
25	−229	+ 20	+115	− 96	− 61	+409	+ 98	− 31	−793	+ 92	+ 18	+440
26	−260	+ 98	+133	−158	− 63	+ 91	+228	− 91	−701	− 81	+144	+475
27	−109	+ 92	+ 33	−173	− 30	− 92	+569	−114	−270	− 42	− 24	+378
28	− 15	− 29	− 33	+ 26	− 80	−227	+761	−211	−289	+239	+ 39	+283
29	+ 14	−223			− 77	−303	+481	−158	− 50	+150	+209	+142
30	+ 72	−295			−260	−325	+202	− 15	+ 45	+193	+426	+149
31	+ 49	−265			−251	−421			+148	+ 53		

Day.	July.		August.		September.		October.		November.		December.	
	Dec.	Temp.	Dec.	Temp.	Dec.	Temp.	Dec.	Temp.	Dec.	Temp.	Dec.	Temp.
1	+422	+112	+203	+291	−266	−132	+101	−135	+ 43	−520	−470	− 52
2	+317	+ 0	+343	− 16	−259	−148	− 34	− 18	+ 4	−514	−393	+ 10
3	+ 75	−103	+218	− 79	−131	− 7	+ 77	+120	− 96	−377	−309	+170
4	−210	−101	+302	−182	+ 93	+111	+243	+ 57	− 39	−293	−306	+151
5	−266	− 79	+188	−100	− 33	+202	+129	+ 15	− 29	−274	−185	+129
6	−354	−102	−124	+121	+ 8	+388	+170	+ 18	−121	−148	− 97	+252
7	−236	−129	−114	+234	+124	+232	+107	+ 41	− 69	− 80	+209	+172
8	−112	− 71	−181	+397	− 1	+ 18	+ 6	+225	−198	+ 16	+228	+114
9	− 88	− 82	−185	+344	+282	− 25	− 78	+251	−245	+225	+261	+153
10	−109	− 29	−206	+513	+188	−134	− 57	+283	−132	+400	+166	+136
11	− 48	− 12	−208	+574	+ 33	−174	+ 84	+278	− 67	+522	+111	+ 79
12	− 22	−110	−155	+413	+122	−209	+152	+219	+107	+610	+223	+ 26
13	+148	− 65	− 97	+289	+121	−165	+213	+251	+329	+ 97	+160	−107
14	+375	+ 57	− 52	+149	+ 80	−157	+288	+ 84	+334	+234	+167	−106
15	+434	+ 96	+ 26	− 28	+353	− 94	+121	−116	+227	+ 78	+148	+ 12
16	+437	+214	+194	−197	+419	− 72	+187	−203	+141	+ 75	+106	+ 55
17	+405	+264	+378	−317	+318	−101	+300	−325	− 40	+142	+170	+ 81
18	+106	+ 96	+316	−419	+335	−100	+118	−211	−119	+211	+209	+ 35
19	+ 38	− 67	+269	−488	−204	+ 30	+181	− 22	− 65	+145	+ 84	− 74
20	−147	−177	+173	−111	−458	+163	− 85	+110	+ 26	+ 82	+135	− 73
21	−361	−297	+199	− 96	−639	+239	−232	+312	+ 73	−145	+ 53	− 28
22	−459	−317	+251	−124	−846	+138	−167	+292	+ 55	−206	00	− 74
23	−659	−279	+429	− 95	−424	+ 78	−195	+350	+ 44	−184	− 28	− 90
24	−631	−323	+253	−333	−518	− 99	−195	+325	− 2	−263	−301	− 77
25	−573	−202	+ 36	−165	−396	−241	−212	+222	+ 28	−264	−291	−116
26	−346	−145	− 76	+ 3	−242	−183	−221	+123	+ 59	−260	−302	− 40
27	− 90	− 78	−190	+124	− 87	−235	−164	− 39	+ 63	−252	−330	− 88
28	+148	− 41	−121	+352	+216	−187	+ 38	−159	− 14	−292	− 31	− 29
29	+267	− 3	− 74	+265	+195	−166	+139	−266	−250	−260	+116	− 22
30	+346	+ 83	−135	+131	+175	−173	+251	−359	−271	−152	+ 11	− 37
31	+273	+177	−262	+107			+146	−510			+ 88	− 29

NOTE.—The following are the Declination-range for the last eight days of 1870: −55, +31, −35, +111, +215, +218, +316, +196.

Table II.—Comparison of Declination-range and Temperature-range Fluctuations for the Year 1872.

Day.	January.		February.		March.		April.		May.		June.	
	Dec.	Temp.	Dec	Temp.	Dec.	Temp	Dec.	Temp.	Dec.	Temp.	Dec.	Temp.
1	− 87	− 60	+118	+ 97	−107	−262	+179	−340	−391	+583	−175	−113
2	−199	− 15	+186	+ 80	−108	−248	+285	−225	−326	+343	− 88	− 4
3	−133	+ 41	+ 16	+ 65	−221	−109	+174	−238	− 50	+ 0	− 17	− 57
4	−101	+ 84	−116	− 42	−214	+ 13	+ 52	−106	+ 68	−182	+138	−137
5	− 13	+ 32	−167	− 55	−367	+210	+ 93	+ 16	+296	−276	+208	+ 56
6	− 56	− 31	−212	− 74	−178	+144	+113	− 29	+388	−310	+422	− 40
7	+149	−113	−100	+ 58	− 11	+149	+182	+ 34	+177	−287	+400	−222
8	+ 34	− 65	+ 24	+120	+ 72	+153	+187	+243	+101	−332	+361	−252
9	−222	+ 66	+ 58	+ 30	+227	+170	+161	+210	− 8	−319	+350	−429
10	−145	+132	+ 50	+ 19	+188	+244	+122	+388	− 36	−148	+264	−443
11	−246	+182	+ 99	− 56	+190	+239	− 68	+421	+ 97	−204	+173	−354
12	−126	+148	+ 71	− 92	+168	+230	− 98	+390	+105	−239	− 47	− 77
13	+213	+108	+ 81	−109	+ 72	+210	−449	+455	+119	− 45	−166	+193
14	+238	+ 98	+ 98	− 98	+ 78	+148	−438	+261	+109	− 43	−335	+307
15	+ 47	+145	+ 97	− 60	+ 8	− 21	−249	+ 92	+ 29	− 86	−347	+467
16	+104	+157	− 2	− 96	− 2	− 88	−171	−133	− 49	−108	−272	+437
17	+ 4	+147	− 46	− 3	+ 41	−275	+ 79	−352	−278	−104	− 68	+310
18	+ 48	+ 85	− 67	+ 86	− 31	−265	+115	−297	−291	+ 19	+ 46	+329
19	+147	+ 34	−202	+116	+ 17	−181	+123	−223	−249	+196	+236	+209
20	+ 73	− 4	−144	+226	+ 57	−116	+ 41	−148	− 48	+393	+319	+ 45
21	+ 36	− 91	−171	+168	+ 88	−131	+138	− 80	+357	+393	+259	+ 55
22	−114	− 36	− 36	+185	+126	−157	+192	−124	+327	+316	+287	+ 5
23	− 58	−115	+ 24	+108	+197	− 91	+265	− 89	+ 65	+383	+ 90	−180
24	+ 10	−168	+ 58	− 3	+118	+136	+403	−106	+ 23	+286	+ 54	−242
25	+ 12	−170	+128	− 73	+ 43	+430	+275	−127	−237	+160	−149	−398
26	+208	−206	− 20	−152	−172	+351	+132	−186	−228	+ 43	−165	−471
27	+190	−122	− 66	−145	−232	+146	− 32	− 37	−180	− 65	−127	−277
28	+ 69	−126	− 45	−242	−247	− 88	−306	+159	−392	−133	−216	+ 40
29	+ 50	− 90	−175	−186	−282	−417	−299	+457	−404	−195	− 12	+ 32
30	− 43	− 78			+ 4	−323	−312	+760	−410	− 51	−115	+ 88
31	− 18	− 42			+ 76	−356			−239	− 72		

Day.	July.		August.		September.		October.		November.		December.	
	Dec.	Temp.	Dec.	Temp.	Dec.	Temp.	Dec.	Temp.	Dec.	Temp.	Dec.	Temp.
1	−101	+205	+127	− 74	+ 59	− 9	− 70	−143	+102	−104	+229	−165
2	−155	+126	+265	−170	− 18	+ 5	+127	−195	+ 92	+ 81	+177	−171
3	−155	+415	+224	−315	−248	− 51	+242	− 74	−105	+ 66	+103	+ 83
4	− 32	+570	+108	−165	− 97	− 60	+303	+158	+ 33	+185	+129	+167
5	− 80	+331	+255	−145	+ 87	−122	+362	+298	− 61	+171	+ 85	+207
6	+ 33	+ 50	+139	−118	+ 59	− 73	+336	+219	−135	+ 50	− 30	+279
7	+ 57	−205	+151	+ 40	+ 26	+ 6	+300	+257	− 27	+ 8	+ 27	+ 32
8	+ 28	−275	+379	−142	− 70	+ 0	+163	+ 93	+ 30	−104	−196	− 97
9	+169	−140	+250	−234	−190	− 34	+ 2	− 65	+ 52	− 85	−364	− 23
10	+319	−120	+319	−329	−244	−146	−225	+ 4	+ 50	− 59	−248	− 45
11	+138	−148	+254	−343	−217	−104	−202	+ 63	+110	−123	−205	+125
12	+ 94	−286	− 81	−109	−323	−111	−187	+191	−153	− 69	− 71	+221
13	+108	−440	−211	+ 34	−240	− 40	−142	+319	− 90	− 95	− 31	+145
14	+ 55	−256	−238	+ 85	−150	+ 23	− 22	+359	+ 65	−248	− 24	+175
15	+289	−225	−414	+253	− 0	− 25	−291	+268	− 15	−244	− 46	+ 53
16	+162	− 6	−247	+254	+247	−143	−470	+ 7	+160	−216	− 35	− 69
17	+212	+132	−264	+277	+248	−125	−488	− 93	+ 73	− 19	+ 7	− 26
18	+ 79	+122	−171	+357	+184	− 79	−375	−139	+ 14	+133	− 32	−106
19	− 57	+413	+ 73	+153	+142	+ 7	−158	−269	+ 75	+262	+ 11	− 92
20	+ 82	+385	− 4	+ 68	+ 64	+214	+176	−279	− 24	+229	+ 20	+ 35
21	− 81	+468	− 77	+ 67	+ 24	+269	+269	−177	−113	+164	+ 21	− 38
22	−198	+453	−345	+212	+ 15	+113	+215	−171	−253	+ 80	+ 43	− 89
23	−284	+225	−156	+203	+ 96	+ 68	+ 94	− 77	−305	+157	− 21	−168
24	−386	+ 66	+ 85	+ 98	+ 26	−111	− 40	− 17	−137	+125	+ 8	−221
25	−304	− 61	+343	+ 54	−100	−151	−114	− 82	+ 33	− 59	− 21	−191
26	−333	− 77	+296	+ 57	−119	−104	− 13	− 73	+ 83	− 67	− 44	−147
27	−274	−102	+195	+ 24	−102	−103	+ 99	+ 53	+ 99	−205	− 89	− 92
28	−210	− 88	+ 56	+ 49	−140	+ 45	+126	+127	+ 17	−174	−168	− 95
29	−338	− 5	+117	+ 40	− 50	−141	+229	+ 46	+ 16	−138	− 25	− 15
30	+ 13	+ 37	+297	−182	+ 21	−112	+188	+ 69	+143	− 89	+160	+ 39
31	+ 81	− 31	+153	−120			+ 89	− 91			+ 49	+ 67

Table III.—Algebraic Sums (as above) for the year 1871.

Declination pushed forward in days..	Months.											
	1, 2, 3.	2, 3, 4.	3, 4, 5.	4, 5, 6.	5, 6, 7.	6, 7, 8.	7, 8, 9.	8, 9, 10.	9, 10, 11.	10, 11, 12.	11, 12. 1 (1872).	12. 1, 2 (1872).
1												
2												
3												
4	20503	24721	34250	..	..	..	..	..	24274			
5	22442	24958	34471	..	..	..	..	..	25287			
6	23540	25060	34202	..	..	..	..	28977	25969	..	..	13374
7	23144	24563	..	29274	..	..	..	30562	26681	22478	..	13290
8	..	24060	..	29702	28432	..	..	31228	25968	22871	..	13608
9	..	..	..	30348	29366	..	..	31484	25192	23283	..	13574
10	..	..	..	30203	29281	28602	..	31008	..	23628	17145	13311
11	..	..	..	29252	29037	28767	26179	29859	..	23595	18079	
12	..	..	..	..	..	28929	27273	..	..	23090	18729	
13	..	..	..	..	..	27955	27561	..	..	..	18560	
14	..	..	..	..	..	..	27050					

Table IV.—Algebraical Sums (as above) for the year 1872.

Declination pushed forward in days	Months.									
	1, 2, 3.	2, 3, 4.	3, 4, 5.	4, 5, 6.	5, 6, 7.	6, 7, 8.	7, 8, 9.	8, 9, 10.	9, 10, 11.	10, 11, 12.
1										
2										
3	14442	..	24052							
4	14718	20890	24611	..	..	..	..	..	19624	
5	14200	21239	24845	..	..	..	..	..	19843	18889
6	..	20419	23646	29280	27123	..	..	20941	19694	19853
7	..	19072	23105	30777	29455	..	..	21405	19254	20200
8	..	..	..	32287	31133	..	..	21453	..	19758
9	..	..	..	32357	32247	30614	..	21205	..	18550
10	..	..	..	31002	31933	31442	..	21490		
11	..	..	..	..	..	32228	23791	21220		
12	..	..	..	..	..	32138	25237			
13	..	..	..	..	..	31522	25915			
14	..	..	..	..	..	..	25727			

7. The following are questions which suggest themselves with reference to the numbers of Table II:—

In the first place, do the inequalities of declination-range at all correspond with those of temperature-range? and, *secondly*, if so, what is the difference in phase between the two sets of inequalities?

I shall endeavour to reply to the last question first. In order to do so, let us take any three months of temperature-range, and try to find how far it is necessary to push forward the declination-range numbers in order to obtain the maximum amount of correspondence between them and those of the temperature-range for the three months under consideration. This will be denoted by a maximum algebraic sum of the two inequalities; in fine, we pursue precisely the same process as that adopted for ascertaining the difference of phase when comparing together the declination-ranges at Kew and Prague ("Proc. Roy. Soc.," vol. 29, page 316).

Now let us perform a number of such operations, taking various sets of three months each, so that the middles of the sets may correspond, as far as possible, to the middles of the various months between the beginning of 1871 and the end of 1872.

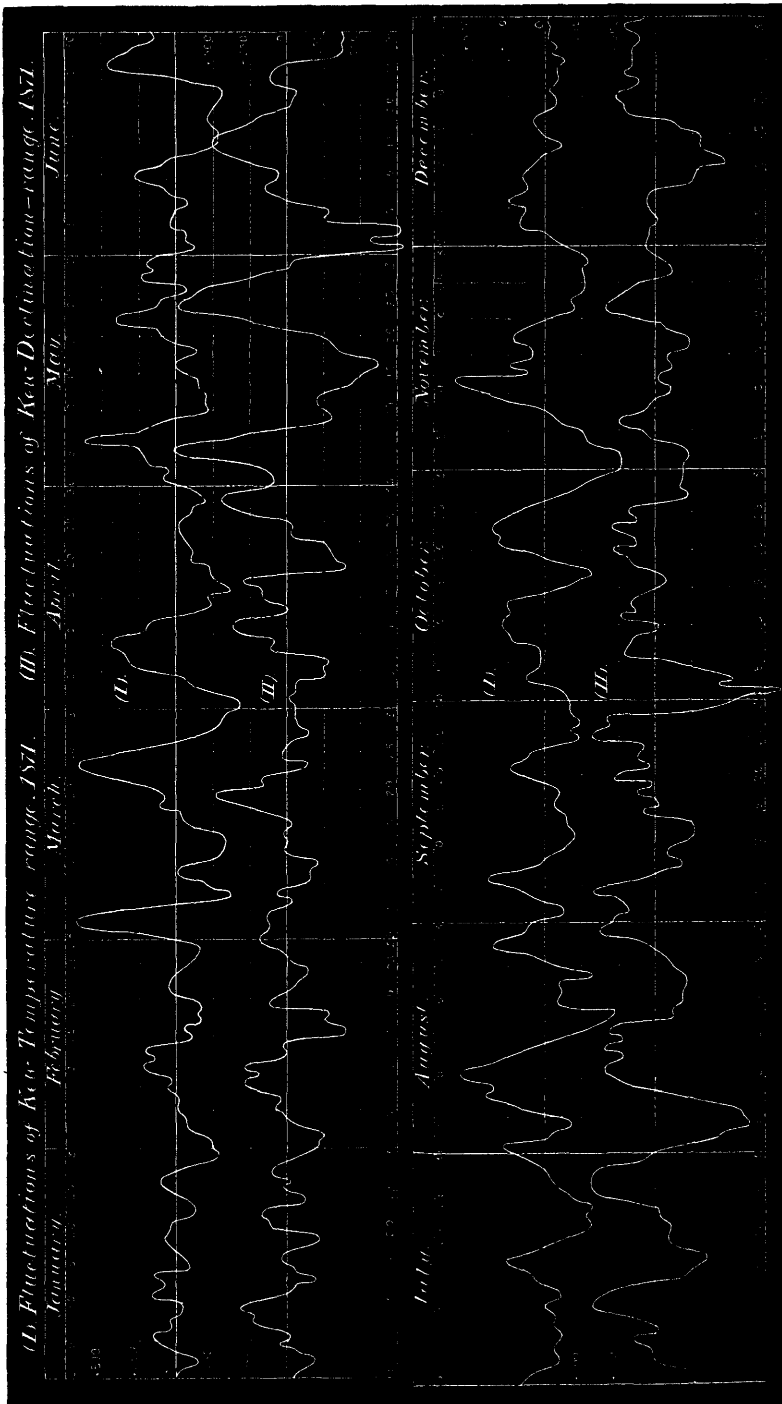
8. The results of this process are exhibited in Tables III and IV, in which, for shortness' sake, the various months of the year are numbered in order, instead of being named.

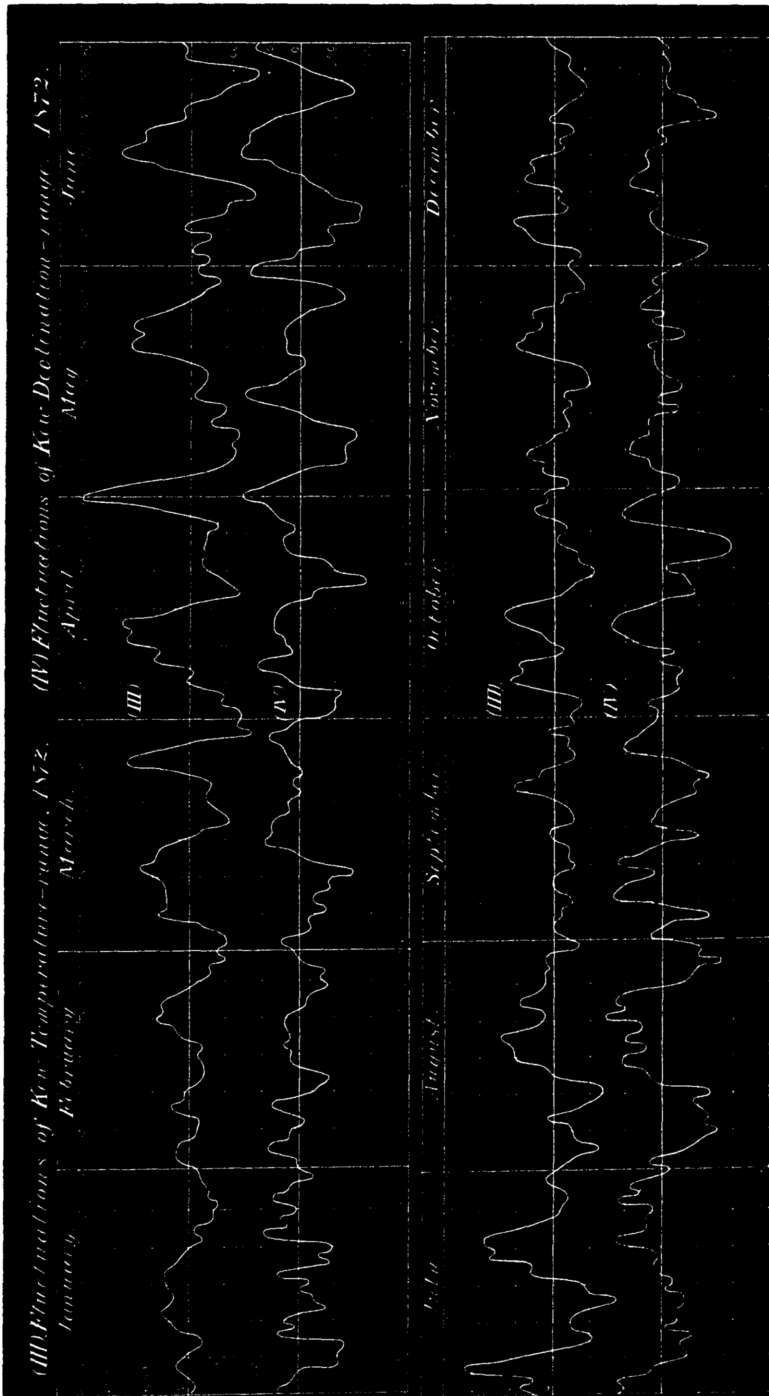
9. The results of Tables III and IV are conveniently embodied in the following table:—

Table V.—Showing by how many Days the Declination-range Fluctuation precedes the corresponding Temperature-range Fluctuation.

Corresponding to middle of month.	Precedence of Declination.		
	First year.	Second year.	Mean.
January	..	8	8
February	6	4	5
March	6	5	5·5
April	5	5	5
May	9	9	9
June	9	9	9
July	12	11	11·5
August	13	13	13
September	9	10	9·5
October	7	5	6
November	10	7	8·5
December	12	..	12

It thus appears that the precedence of declination is smallest about the equinoxes and greatest about the solstices, and it seems probable


(I.) Fluctuations of Kew-Temperature-range. 1871. (II.) Fluctuations of Kew-Declination-range. 1871.
January
February
March
April
May
June
July
August
September
October
November
December
(I.)
(II.)
(I.)
(II.)


(III) Fluctuations of Kew Temperature-range. 1872.
(IV) Fluctuations of Kew Declination-range. 1872.
January
February
March
April
May
June
July
August
September
October
November
December
(III)
(IV)
(III)
(IV)

that were a considerable number of years so treated, more exact values exhibiting the law would be obtained. The law itself is sufficiently obvious in each of the two years now treated.

10. It has still to be ascertained to what extent the two fluctuations, when brought together so that similar phases coincide as nearly as possible, show any distinct resemblance to each other.

The evidence on this point is given by the diagrams which accompany this paper. These contain curves representing the continuous progress of the two sets of fluctuations for the years 1871 and 1872, these being portioned out into months. The temperature-range curve has a uniform time scale. The declination-range curve is pushed forward by a distance derived from the last column of Table V. Thus for January of each year it is pushed forward eight days, for February of each year five days, and so on. The consequence of this is that the declination-range scale, while constant for the various portions of the same month, yet varies slightly from one month to another.

An inspection of the curves will show that there is a considerable likeness between them. Perhaps this likeness is greater in the second than in the first year, but it must be borne in mind that 1871 was a year of great magnetic disturbance, and therefore unfavourable for such a comparison.

It would thus seem as if a comparison of magnetical and meteorological weather might be made a promising subject of inquiry, besides being one which may perhaps lead to results of practical importance.

Before concluding I beg to thank Messrs. William Dodgson and Alfred Nish for the assistance which they have rendered in this investigation.