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CONTENTS OF THIS NUMBER.

PAPERS ON METEOROLOGY IN CANADA.

1. EXTRACTS FROM A PAPER IN THE *CANADIAN JOURNAL* FOR 1863, "ON THE MAGNETIC DISTURBANCES AT TORONTO, DURING THE YEARS 1856 TO 1862, INCLUSIVE," BY G. T. KINGSTON, M.A., DIRECTOR OF THE MAGNETIC OBSERVATORY.

A few years prior to the establishment of the Colonial Magnetic Observatories in 1839–40, the attention of philosophers in Germany had been directed to certain magnetic phenomona, consisting sometimes in abrupt changes of short duration, and sometimes in a long continued abnormal condition of the magnetic elements. These disturbances as they are termed, at first attributed to variations in atmospheric temperature and other local causes, were discovered by comparing preconcerted contemporaneous observations to prevail simultaneously, and to correspond in direction, and to great extent also in amount, at different and distant parts of Germany. The improbability of local origin which this synchronism in their occurrence indicated, and the probability wherewith it suggested some extra terrestrial influence, was greatly strengthened by the observations at the observatories at Toronto, Hobarton, &c., which first brought to light the fact that the disturbances occurred simultaneously, not only within a small region in Europe, but also at stations widely removed from each other on the earth's surface. It was found, however, that the disturbing influence would frequently affect different elements at two distant stations, or the same element to a different extent or in an opposite direction.

It was further made known that the disturbances, though in the ordinary sense irregular, are subject in their frequency and aggregate amount to definite periodic laws, manifesting a preference, so to speak, for certain hours of the day and night, and for certain months in the year.

The existence and general character of this periodicity was exhibited by the approximate methods employed in the earlier volumes of the colonial observations, but it was by the more accurate system first developed by General Sabine, in the 3rd volume of the Toronto Observations, and since applied by him to the observations of other stations, that the periodic laws were rendered definite and precise.

In the method referred to, the disturbed values of an element under discussion, are confined to those which differ from the normal value of that element proper to the hour by an amount equal or exceeding a certain definite limit, such normal being the average of the values of the element for that hour, during a month or some other suitable group of consecutive days, excluding all the disturbed values and including all others; the magnitude of the disturbance being measured by the difference between the actual and the normal value of the element.

The disturbance limit for an element, determined on with reference to the amplitude of its regular periodic variations, is generally different at different stations; but for the sake of inter-comparison must be constant at the same station.

Of the facts revealed by discussing the disturbances at several stations, the following are among the most prominent:—

(1) The frequency and amount of disturbance of the declination, inclination, and force, have a diurnal and an annual period.

(2) The disturbances of the elements without regard to sign, the disturbances in which the needle is deflected to the east, and those in which it is deflected to the west of its normal position, as well as the disturbances which increase, and those which decrease the force and inclination, have all distinct and often different periodic laws.

(3) The periodic variations at different stations, though possessing the same general characters, exhibit in their epochs of maximum and minimum, very great diversities.

(4) In addition to the diurnal and annual periods, the yearly aggregates of disturbance for each element and at every station are subject to a periodic increase and diminution, occupying a cycle of about ten years, which corresponds both in its length and in the epochs of maximum and minimum, with a periodic variation in the number of groups of spots on the surface of the sun. The disturbances discussed, and the results announced by General Sabine, in the 3rd volume of the Toronto Observa-

tions, relate to the hourly observations from 1st July, 1843, to 30th June, 1848. It is my purpose in the present communication to give analogous results for the years 1856 to 1862, inclusive, partly to shew that the diurnal and annual variations of the disturbances are substantially the same in the more recent as in the earlier series, but chiefly for the purpose of furnishing materials for discovering the precise character of the so-called decennial period.

In the investigations on which the accompanying tables are based, those disturbances only are included which equal or exceed the limits employed by General Sabine; namely, for the declination, 5'.0; horizontal force, ·0012; vertical force, ·00026; total force, 0004; inclination, 1'.0.

* * * * * * *

On comparing the series 1856 62, with that of 1844–48, the general correspondence in the ratio is very apparent, the chief characteristic difference in the later series being, that the distinctive features of different parts of the day, as shown in the earlier series, are somewhat softened down; the ratios that are above unity being for the most part less, and those that are less than unity, being greater in the later than the earlier series. In one case only, namely, of the disturbances that increase the horizontal force at 8 a.m., do the ratios lie on opposite sides of unity in the two series; but on referring to table viii., page 14, vol. iii. of Toronto Observations, we find that the ratios at 9 a.m. and 10 a.m. are 0·94 and 1·46, so that the discrepancy amounts simply to a transfer of the passage through unity from about 9 a.m. to 8 a.m.

* * * * * * *

Other points of difference in the two series are the following:

(1) In five instances the September maximum is transferred to October.

(2) In nearly every case the April maximum occurs in March, and in the general disturbances of declination, and in those of westerly disturbance the ratio is less than unity.

(3) In every case there is an abrupt decrease in the November disturbances with a subsequent increase in December.

The generality of these points of difference, as far as they extend, will be better seen by comparing the means of the ratios, for the declination, horizontal force and vertical force, as given in the following table:

	January.	February	March.	April.	May.	June.	July.	August.	Septemb.	October.	Novemb.	Decemb.
1844—1848	0.57	0.84	1.04	1.47	1.09	0.46	0.75	0.99	1.64	1.36	0.84	0.65
1856—1862	0.70	0.63	1.10	1.03	0.84	0.74	1.05	1.29	1.60	1.44	0.57	1.01

In the following table is shewn the comparative prevalence of easterly and westerly disturbances of declination in the different months. The ratios indicating the preponderance of easterly and westerly disturbances reach a maximum in June, a minimum in December, a second maximum in March, with a second minimum in April:

	January.	February	March.	April.	May.	June.	July.	August.	Septemb.	October.	Novemb.	Decemb.
1844 to 1848 from 24 observations daily	1.29	1.27	1.40	1.04	1.29	3.62	1.41	1.96	1.29	1 21	0.77	0.74
1856 to 1862 from 6 observations daily	0 85	0.86	2.35	1.29	1.84	3.46	1.87	1 53	1.26	0.54	1.15	0.70

The relative amount of easterly and westerly disturbances of declination, and of the disturbances which increase and decrease the total force and inclination, are indicated by the following ratios, whereby it will be noticed that while the preponderance of easterly over westerly disturbances has increased the preponderance in the disturbances which decrease the force, and in those which increase the inclination, has become much less in the later series:

	Declination East to West.	Hor'l Force Decreasing to Increasing.	Ver'l Force Decreasing to Increasing.	Total Force Decreasing to Increasing.	Inclination Increasing to Decreasing.
1844 to 1848 from 24 observations daily	1.28	6.4	1.4	1.9	5 6
1844 to 1848 from 6 observations daily	0.9	5.4	1.5	1.9	
1856 to 1862 from 6 observations daily	1.28	3.5	1.1	1.4	3.5

[*Note.*—Want of space compels us to omit the remainder of this valuable paper, but it will be found entire in the *Canadian Journal* for March, 1863.—*Ed. J. of E.*]

2. METEOROLOGICAL STATIONS AT THE SENIOR COUNTY GRAMMAR SCHOOLS OF UPPER CANADA.

Under the authority of the Consolidated Grammar School Act, a special grant of $400 per annum is made to each Senior County Grammar School, with participation in the distribution of the General School Fund; provision is also made for the establishment of a Meteorological Station at each of these Senior Schools and it is declared to be *the duty* of the master to make the prescribed Meteorological Returns every month to the Educational Department. Out of the 31 Counties in which Senior County Grammar Schools have been established, only 19 have contributed the necessary sum of half-price to purchase the necessary instruments, and but few of these (as will be seen from the following table) make the returns required by law. Steps, it is hoped, will shortly be taken to enforce the law, or restrict the grant to those Stations only from which returns are received.

[The following tables and corresponding returns were sent down to the Committee of the House of Assembly on Emigration, at its request.]

Name of Meteorological Station.	No of Months the Station has been established, to December, 1862, inclusive.	No. of monthly abstracts received at the Education Office, to Dec., 1862, inclusive.	Character of abstracts received.		
			Well prepared.	Indifferently prepared.	Badly prepared.
1. Niagara...	60	13	11	2	..
2. Hamilton .	60	48	45	3	..
3. Belleville .	60	45	43	2	..
4. Barrie	60	20	20	..	..
5. Chatham..	60	15	..	11	4
6. Port Sarnia	60	26	26	..	..
7. Milton....	59	3	..	..	3
8. Cornwall..	59	42	42	..	..
9. Guelph ...	52	1	1	..	..
10. Whitby ...	52	48	47	1	..
11. Perth	51	10	10	..	..
12. Picton....	51	27	27	..	..
13. Brantford .	42	25	23	2	..
14. Stratford..	29	29	29	..	..
15. L'Orignal .	16	..	..	..	..
16. Ottawa ...	16	10	14	..	..
17. Woodstock	14	..	..	.	..
18. Cayuga...	10	4	4	..	..
19. Peterboro'.	2	..	..	..	..

TABLE SHEWING THE NUMBER OF MONTHS THAT METEOROLOGICAL ABSTRACTS HAVE BEEN RECEIVED FROM THE DIFFERENT STATIONS, FOR THE YEAR 1862.

Name of Meteorological Station.	When established.	Character of Abstracts received.		
		Well prepared.	Indifferently prepared.	Badly prepared.
1 †Niagara.....	1858	3	..	..
2 Hamilton	1858	12	..	..
3 †Belleville	1858	7	..	..
4 †Barrie	1858	..	..	..
5 †Chatham.....	1858	..	..	..
6 †Port Sarnia	1858	..	..	..
7 †Milton	1858	..	..	..
8 †Cornwall	1858	11	..	..
9 †Guelph	1858	..	..	..
10 Whitby	1858	12	..	..
11 †Perth.....	1858	..	..	..
12 †Picton.....	1858	5	..	..
13 †Brantford	1859	4	..	..
14 Stratford	1860	12	..	..
15 †L'Orignal	1861	9	..	..
16 †Ottawa	1861	6	..	..
17 †Woodstock.....	1862	..	..	..
18 †Cayuga.....	1862	4	..	..
19 †Peterborough.....	1862	..	..	..

† The returns required by law have only been received in part, or not at all, from these Stations during the year 1862.

ABSTRACT OF METEOROLOGICAL OBSERVATIONS MADE AT SOME OF THE SENIOR COUNTY GRAMMAR SCHOOL STATIONS IN UPPER CANADA, DURING THE YEARS 1859, 1860, 1861, AND 1862.

(Compiled at the Educational Department, Toronto.)

NOTE.—As the prescribed monthly Meteorological Reports have not been regularly received from the different Stations (see Tables A and B), we are not able to insert a complete abstract for the entire year; we have, however, selected four monthly reports of each year, the calculations in which are actually correct.

1859.	Barometer.			Temperature of Air.				Warmest Day.		Coldest Day.		Humidity.	Rain.	Snow.	1859.
Month.	Highest.	Lowest.	Greatest Daily Range.	Highest Temperature.	Lowest Temperature.	Greatest Daily Range.	Least Daily Range.	Date.	Mean Temperature.	Date.	Mean Temperature.	Mean.	No. of Days.	No. of Days.	General Remarks.
1. BARRIE.—Rev. W. F. CHECKLEY, B.A., *Observer.*															
January	29.531	28.414	.458	46.6	-37.0	40.0	1.4	20	40.6	8	-1.0	66	..	9	
June	29.478	28.822	.471	91.1	28.0	42.6	14.1	28	76.4	4	36.6	44	10	..	
August	29.330	28.976	.120	91.6	44.0	37.9	5.4	10	77.9	29	52.8	54	5	..	
October	29.449	28.698	.462	78.3	19.8	28.0	4.6	4	65.9	26	28.8	36	7	2	
2. BELLEVILLE.—A. BURDON, Esq., *Observer.*															
January	30.292	28.924	.669	46.3	-30.0	36.7	5.0	20	40.1	10	19.1	86	2	7	
April	29.966	28.980	.531	68.6	20.7	27.3	7.5	30	58.7	5	29.6	69	7	..	Aurora on the 29th of April.
June	29.912	29.288	.452	83.5	33.8	33.9	8.8	27	76.4	4	40.5	76	6	..	
October	29.936	29.064	.596	76.5	17.4	26.4	7.0	4	62.8	26	27.0	78	5	..	
3. CHATHAM.—G. JAMIESON, Esq., *Observer.*															
January	29.919	28.807	.519	47.5	-16.0	33.0	3.0	20	41.8	10	0.5	79	3	1	
February ...	29.655	28.927	.502	56.2	-1.5	38.6	6.9	19	40.7	7	12.6	80	4	4	
July	29.806	29.062	.301	95.0	40.2	37.5	12.6	18	80.2	5	61.3	72	4	..	
October	29.702	29.049	.404	76.5	21.6	37.9	4.3	13	59.5	27	29.4	75	4	4	
4. CORNWALL.—Rev. H. W. DAVIES, M.A., *Observer.*															
January	30.523	29.005	.529	49.0	-7.1	38.7	4.1	21	36.6	12	-6.9	71	N. R.	2	
March	30.308	28.491	.596	57.7	-3.8	28.4	3.8	29	45.2	1	7.7	78	6	2	
June	29.987	28.906	.731	78.2	34.2	33.3	7.1	2	70.0	4	42.9	80	5	..	
October	30.103	29.223	.453	77.2	17.7	42.6	6.3	13	63.7	20	20.8	76	3	3	
5. HAMILTON.—A. MACALLUM, Esq., *Observer.*															
January	30.452	28.888	.667	47.4	-29.7	41.4	4.6	20	45.0	10	-14.4	78	4	2	
April	29.937	28.785	.549	59.5	24.6	27.6	7.6	12	53.7	5	31.9	75	3	4	Two Auroras seen in April.
June	29.946	29.246	.488	80.5	37.5	33.0	10.5	15	70.5	4	39.6	76	9	..	
October	29.930	29.329	.372	76.7	24.1	40.3	11.3	4	68.7	26	27.0	70	8	2	
6. PERTH.—R. T. LIVINGSTONE, Esq., *Observer.*															
September...	29.820	28.694	.727	74.2	27.8	35.2	7.0	12	63.2	14	42.7	N.R.	15	1	
October	29.779	28.830	.739	73.8	14.6	38.2	10.1	5	62.5	26	23.4	75	7	..	First Snow on the 14th of
November ..	29.946	28.744	1.062	63.8	13.4	27.8	8.1	5	51.8	29	18.8	84	N.R.	N.R.	Sept., at 7 a.m.
December ...	30.189	28.924	.825	54.6	-30.2	39.1	6.1	1	41.0	28	19.6	82	N.R.	13	
7. SARNIA.—W. B. EVANS, Esq., M.A., *Observer.*															
January	29.920	28.715	.605	46.4	-23.6	33.8	3.5	14	29.9	10	-1.0	91	2	4	On April 19th, a white luminous
April	29.739	28.586	.576	66.1	24.7	33.9	3.8	11	55.9	4	30.9	91	2	..	streak was visible in the hea-
October	29.648	28.969	.450	N.R.	25.5	N.R.	N.R.	5	65.6	26	28.1	92	2	..	vens for about an hour. It was
December ...	29.932	28.831	.624	53.9	3.6	35.9	4.1	13	46.6	9	9.7	95	1	7	first seen at 8 p.m., extending
															from E. hor. to Z.; afterwards
															to W. hor., forming an arch.
8. WHITBY.—WILLIAM McCABE, Esq., *Observer.*															
January	30.327	29.428	.432	48.8	-22.6	43.2	1.8	21	35.6	11	6.4	72	1	4	
March	30.225	28.413	.364	59.6	16.9	31.8	8.8	28	50.1	1	16.7	78	10	1	
July	30.132	29.291	.408	94.6	53.9	40.8	15.8	12	82.1	26	56.6	76	4	..	
October	30.047	29.132	.703	70.6	21.3	..	..	6	60.1	26	27.7	76	4	..	

NOTE.—No returns were received from four stations during 1859, viz.: Niagara, Milton, Guelph, and Picton.

1860.															
1. BARRIE.—Rev. W. F. CHECKLEY, B.A., *Observer.*															
February ...	29.486	28.826	.709	51.6	-30.1	44.6	7.1	22	44.4	10	1.7	62	5	6	
March	29.436	28.571	.368	60.6	-0.3	41.1	13.8	3	42.3	12	13.6	74	2	..	
May	29.357	28.517	.301	89.1	19.8	46.6	10.4	30	65.9	2	42.6	77	7	..	
2. BELLEVILLE.—A. BURDON, Esq., *Observer.*															
January	30.123	29.222	.662	43.7	-14.4	40.1	8.5	24	38.9	2	-3.8	85	3	8	
February ...	30.101	29.068	.734	48.1	-12.5	38.0	8.6	22	43.9	17	-2.6	86	4	6	
April	30.210	29.025	.957	67.0	14.4	35.8	8.1	30	58.1	2	22.1	69	6	1	
June	29.825	28.993	.369	79.7	49.9	27.2	4.6	28	70.6	9	55.6	76	11	..	

1860.	BAROMETER.			TEMPERATURE OF AIR.				WARMEST DAY.		COLDEST DAY.		Humidity.	RAIN.	SNOW.	1860.
MONTH.	Highest.	Lowest.	Greatest Daily Range.	Highest °Temperature.	Lowest °Temperature.	Greatest °Daily Range.	Least °Daily Range.	Date.	Mean °Temperature.	Date.	Mean °Temperature.	Mean.	No. of Days.	No. of Days.	GENERAL REMARKS.
3. BRANTFORD.—D. C. SULLIVAN, ESQ., AND OTHERS, *Observers.*															
June	29.471	28.600	.322	87.5	39.1	38.8	12.1	28	74.7	9	53 6	71	6	..	
July	29.545	28.847	.256	95.0	43.3	38.6	13.1	19	75.8	23	60.1	70	11	..	
August	29.599	28.978	.270	91.0	44.3	41.3	8.6	6	77.6	27	54.8	75	8	..	
October	29.582	28.709	.562	68.0	31.1	27.4	7.6	31	60.1	12	38.7	84	9	..	
4. CORNWALL.—REV. H. W. DAVIES, M.A., *Observer.*															
January	30.275	29.072	.585	49.5	-9.9	39.0	4.4	21	38.3	13	-5.5	86	2	5	April 20. First boat passed thro' the canal. — Oct. 17. At 5.45 a.m., an earthquake was felt it lasted about 4 minutes. A lighter shock was felt on the 24th at 7 a.m.
April	29.912	29.191	.512	53.5	11.5	24.1	10.3	12	45.0	2	17.4	84	3	1	
June	29.958	29.071	.427	83.2	54.9	30.1	8.6	14	71.8	19	45.1	81	10	..	
October	30.113	29.028	.579	64.0	29.2	22.8	6.5	31	59.8	15	37.2	83	18	1	
5. HAMILTON.—A. MACALLUM, ESQ., *Observer.*															
January	30.004	29.150	.476	46.8	-0.3	39.2	5.9	24	44.1	31	7.3	67	5	9	July 1. A comet was seen in the N.W. at 9 p.m. About 20 min. past nine, a meteor of great brilliancy passed from S. W. to E
April	30.199	28.944	.966	78.7	23.7	N.R.	N.R.	30	60.2	14	30.7	66	12	3	
July	29.861	29.018	.582	89.7	42.8	33.2	11.2	16	79.3	10	61.9	70	11	..	
October	29.894	28.961	.680	69.6	28.6	35.2	3.2	5	62.9	12	40.2	85	13	..	
6. PERTH.—R. T. LIVINGSTONE, ESQ., *Observer.*															
January	29.981	28.955	.825	45.4	-30.8	44.4	11.0	24	38.5	2	-17.6	80	5	17	
February ...	29.949	28.801	.792	48.7	-25.7	40.9	10.1	22	43.2	1	-12.5	80	5	10	
March	29.762	28.679	.830	64.8	8.3	35.9	5.0	19	49.5	22	15.4	76	4	7	
April	29.959	28.835	1.008	68.8	9.7	41.6	11.5	30	59.8	2	16.6	63	6	3	
7. PICTON.—STUART FOSTER, ESQ., *Observer.*															
April	30.241	29.031	.952	74.4	16.0	36.1	9.0	30	57.1	2	22.0	65	13	4	April 12. At 8 p.m., a narrow belt of light, extending from N. W. to S. E., and a small auroral arch, were observed.—Oct. 26. Eclipse of the sun, visible from 7 a.m. till 8.58. At 6.45 p.m., an earthquake was felt, accompanied by noise resembling thunder.
July	29.819	29.170	.395	85.4	50.4	29.7	10.2	19	73.1	5	58.2	78	13	..	
November ..	29.997	28.923	.791	68.7	17.4	23.5	6.7	1	64.3	24	23.2	84	19	9	
October	29.979	29.076	.582	69.4	27.1	26.5	5.9	31	64.0	6	38.5	85	17	..	
8. SARNIA.—W. B. EVANS, ESQ., M.A., *Observer.*															
January	29.927	28.885	.554	48.8	-12.0	N.R.	N.R.	24	44.5	1	4.9	98	2	2	
February ...	29.758	28.741	.721	61.6	-9.2	41.8	6.7	22	50.3	1	4.2	95	1	5	
June	29.606	28.651	955	87.2	39.8	36.7	7.4	28	74.0	5	51.1	90	3	..	
October	29.651	28.820	.458	76.7	31.8	32.8	6.1	18	64.8	27	45.1	92	5	..	
9. STRATFORD.—C. J. MCGREGOR, ESQ., M.A., *Observer.*															
September...	29.169	28.413	.403	76.3	25.5	35.2	9.9	5	67.9	29	36.2	81	11	..	Auroras seen on the 6th, 10th, and 17th of Sept.—An Ærolite was seen on 14th of October; time of flight, 2 secs.—Auroras seen on the 10th and 15th of November.
October	29.049	28 192	.559	63.8	26.2	25.3	3.6	31	56.9	12	35.6	85	15	..	
November...	28.967	27 970	.525	65.4	5.8	26.5	3.7	2	56.9	24	12.0	84	7	13	
December...	29.249	27.975	.640	36.3	-14.4	29.8	3.5	20	34.5	14	-2.4	89	2	14	
10. WHITBY.—W. MCCABE, ESQ., *Observer.*															
January	30.185	29.278	.549	48.7	-3.6	36.6	4.8	24	40.9	31	4.4	77	2	3	
April	30.274	29.042	.761	72.7	20.7	30.7	4.7	30	54.7	2	26.8	68	5	..	
July	29.922	29.178	.435	86.3	53.0	29.3	5.8	19	77.4	27	60.3	80	8	..	
October	30.015	29.140	.258	68.7	32.5	30.3	5.8	30	58.3	13	37.1	87	2	..	

NOTE.—No returns were received from four stations during the year, 1860, viz.: Niagara, Chatham, Milton, and Guelph.

1861.															1861.
1. BARRIE.—REV. W. F. CHECKLEY, B.A., *Observer—for a portion of the year only.*															
June	29.267	28.672	.388	88.1	34.0	43.1	6.6	11	73.5	15	52.9	79	5	..	Comet visible N.W. in June.
2. BELLEVILLE.—A. BURDON, ESQ., *Observer.*															
January	30.320	29.114	.707	36.5	-26.2	52.3	5.9	29	31.5	12	-11.4	92	N.R.	N.R.	
April	30.004	29.100	.465	69.9	21.7	36.1	6.4	22	60.9	1	29.6	71	4	1	Comet visible N.W. in June.—October a very rainy month.
June	29.673	28.672	.388	88.1	34.0	43.1	6.6	11	73.5	13	52.9	70	5	..	
October	29.944	28.997	.640	67.9	24.9	26.3	5.2	2	59.7	24	32.9	84	14	..	
3. BRANTFORD.—D. C. SULLIVAN, ESQ., AND OTHERS, *Observers.*															
January	29.873	28.624	.741	41.5	-21.7	23.3	6.3	7	34.6	12	-1.2	87	1	..	
April	29.599	28.678	.444	74.3	27.1	34.1	6.7	22	63.0	1	33.1	70	9	..	Comet visible in N. horizon 22nd June.
June	29.427	28.843	.374	90.6	36.6	39.9	11.0	11	76.0	5	50.0	66	8	..	
September ..	29.547	28.742	.649	79.3	39.1	29.0	7.7	19	69.4	28	46.3	82	9	..	

1861. Month.	Barometer. Highest.	Lowest	Greatest Daily Range.	Temperature of Air. Highest °Temperature.	Lowest °Temperature.	Greatest °Daily Range.	Least °Daily Range.	Warmest Day. Date.	Mean °Temperature.	Coldest Day. Date.	Mean °Temperature	Humidity Mean.	Rain. No of Days.	Snow No. of Days.	1861. General Remarks.
4. CORNWALL.—Rev. H. W. DAVIES, M.A., *Observer.*															
January	30.275	29.072	.585	49.5	-9.9	39.0	4.4	21	38.3	13	-5.5	86	2	5	First boat passed through canal 20th April.—An earthquake, which lasted about 4 minutes, was felt at 5.45 a.m. 9th Oct.
April	29.912	29.191	.512	53.5	11.5	24.1	10.3	12	45.0	2	17.4	84	3	1	
June	29.958	29.071	.301	83.2	54.9	30.1	8.6	14	71.8	19	45.1	81	10	..	
October	30.113	29.028	.579	64.0	29.2	22.8	1.5	31	59.8	15	37.2	83	18	1	
5. HAMILTON.—A. MACALLUM, Esq., *Observer.*															
January	30.231	28.946	.663	44.0	-21.2	35.7	5.4	16	34.3	12	-2.9	81	5	14	
April	30.013	28.916	.391	77.8	20.8	35.8	9.2	22	66.3	18	31.7	71	9	2	
June	29.738	29.141	.463	91.8	38.6	36.8	9.8	11	79.9	5	45.0	58	8	..	
October	29.942	29.144	.648	72.4	29.8	30.0	7.6	3	66.5	25	44.7	70	11	..	
6. NIAGARA.—The Rev. H. PHILLIPS, M.A, *Observer.*															
March	30.199	29.239	.727	58.7	3.4	39.5	8.0	29	47.5	7	10.6	84	7	8	First vessel seen on Lake Ontario on 13th March.—Violent snow storm 1st May.—Last vessel seen passing Niagara on 18th December.
May	30.051	28.707	.684	75.7	31.6	34.5	7.7	24	66.9	1	35.3	82	11	1	
October	30.106	29.112	.657	71.4	30.3	27.0	6.1	5	63.4	24	36.9	90	9	1	
December ...	30.281	29.276	.954	64.5	9.5	38.4	6.0	10	60.3	3	17.1	86	6	6	
7. OTTAWA.—G. KENNEDY, Esq., M.A., *Observer.*															
September...	30.177	29.021	.766	79.2	37.6	30.1	6.1	3	68.8	29	42.7	79	7	..	A meteor at 8.20 p.m on Sept 7.—First sleighing 23rd Nov.—Last trip of mail steamer on River Ottawa, 30th November.
October	30.159	29.076	.641	67.8	24.7	25.1	5.3	2	59.3	24	32.6	80	11	..	
November ..	30.035	29.045	.763	51.2	24.2	17.6	5.6	6	43.4	15	29.3	80	5	7	
December ...	30.216	29.216	.910	56.0	-5.9	36.4	6.0	8	44.6	28	4.7	80	6	8	
8. PERTH.—R. T. LIVINGSTONE, Esq., *Observer.*															
October	29.107	28.095	.595	67.8	24.0	28.4	5.5	5	61.9	28	35.9	88	14	1	
9. PICTON.—STUART FOSTER, Esq., *Observer.*															
January	30.381	29.128	.743	39.2	-17.4	48.4	7.0	19	31.3	12	-9.0	85	2	20	
April	30.121	29.160	.242	73.5	24.8	39.5	7.6	22	57.7	1	30.1	71	8	4	First steamer came into the harbour on 17th April.
June	29.830	29.207	.389	86.5	47.3	29.7	7 2	11	73.5	4	56.1	76	10	..	
October	30.101	29.057	.569	70.2	29.0	23.0	7.5	2	62.3	24	34.2	89	13	..	
10. STRATFORD.—C. J. McGREGOR, Esq., M.A., *Observer.*															
February ...	29.098	28.083	.951	50.1	-17.1	35.0	4.9	28	42.9	8	6.2	55	6	13	Wild pigeons seen 13th April.—Currant, rose, and lilac bushes in leaf, 29th April.—Brilliant comet seen at 9.30 p.m on 30th June.
April	29 139	28.174	.498	72 4	23.7	30.9	4.2	22	65.0	1	30.2	70	10	3	
June	28.926	28.442	.453	83.9	37.4	34.9	5.6	11	71.7	5	51.5	76	11	..	
November ...	29.068	28.182	.627	50.6	19.0	22.8	4.2	5	42.8	25	24.8	82	11	..	
11. WHITBY.—W. McCABE, Esq., *Observer.*															
January	30.284	29.069	.758	45.8	1.8	27.6	1.8	16	32.7	12	4.5	72	1	5	
April	30.110	29.168	.476	71.3	21.6	40.3	3.3	22	57.3	1	32.2	79	3	..	
June	29.839	29.212	.483	94.3	31.0	48.3	12.2	10	78.4	4	54.6	81	5	..	
October	30.081	29.115	.597	70.8	5.8	39.7	5.8	2	62.2	24	34.6	81	4	..	

Note.—No returns were received from six stations during 1861, viz.: Chatham, Port Sarnia, Milton, Guelph, L'Orignal, and Woodstock.

1862.															1862
1. BELLEVILLE.—A. BURDON, Esq., *Observer.*															
February ...	29.935	28.909	1.026	39.0	-5.0	28.9	7.4	18	35.2	25	5.1	93	0	7	
March	29.805	28.872	.933	41.4	7.1	26.6	6.9	10	36.1	1	19.5	92	3	4	
April	30.002	29.040	.962	66.5	18.9	29.9	6.6	17	59 6	7	27.1	80	7	0	
May	29.750	29.299	.521	75.6	34.3	35.6	5.4	17	67.9	20	45.2	67	5	0	
2. BRANTFORD.—JAMES J. WADSWORTH, Esq. *Observer.*															
January.....	29.837	28.801	1.036	44 7	-11.9	29.0	8.6	10	37.4	14	4.8	80	0	7	
February....	29.677	28.628	1.049	44.4	-10.4	28.8	9.9	6	37.8	15	6.8	84	1	4	
March	29 414	28 489	.925	44.6	4.8	27.8	6 0	10	40.1	6	18.8	87	6	1	
April	29.684	28.908	.776	75.0	21.0	35.7	7.7	16	60.8	7	26.0	76	4	0	
3. CAYUGA.—WILLIAM SINCLAIR, Esq., B.A. *Observer.*															
March	29.988	28.738	1.250	54.8	-4.4	39 6	8 0	10	38 7	5	21.1	81	8	5	Rain storm at 9 p m. on the 14th. The rain froze as it fell, encrusting the trees, and doing much damage.
April	29.758	28.634	1.124	78.7	20.2	38 5	6.2	16	65.3	8	29.5	68	6	0	
May*	29.557	29.002	.555	83 7	31.3	45.6	12 7	16	66.7	19	41.3	56	5	0	
June.....	29.771	28.916	.855	86.7	35.0	41.7	13.7	28	74.2	19	50.4	67	9	0	

* A great storm of wind and rain occurred on the 22nd, at 3 p.m. It did not visit Cayuga; but at Balmoral, a few miles west, it overturned buildings, rooted up trees, &c., and destroyed the bridge crossing the Grand River at York.

1862. Month.	Barometer. Highest.	Barometer. Lowest.	Barometer. Greatest Daily Range.	Temperature of Air. Highest °Temperature.	Temperature of Air. Lowest °Temperature.	Temperature of Air. Greatest °Daily Range.	Temperature of Air. Latest °Daily Range.	Warmest Day. Date.	Warmest Day. Mean °Temperature.	Coldest Day. Date.	Coldest Day. Mean °Temperature.	Humidity. Mean.	Rain. No. of Days.	Snow. No. of Days.	1862. General Remarks.
4. CORNWALL.—THE REV. H. W. DAVIES, M.A., *Observer.*															
February....	30.284	29.020	1.264	44.5	-7.7	36.8	11.5	12	30.2	25	2.9	78	1	12	
April*.....	30.226	29.423	.803	66 0	14.2	38.3	11.3	28	49.1	8	25.3	80	1	1	* Swallows seen on the 9th.
August	29.971	29.253	.718	90.5	37.7	44.8	13.6	11	76.5	29	58.0	74	9	0	Canal opened on the 17th.
November†..	30.597	29.116	1.481	62.0	11 5	35.5	9.3	1	48.7	7	24.0	78	3	6	
† At 9 p.m. on the 15th, the barometer stood at 30.597, the highest noted since observations were begun at this Station in 1838.															
5. HAMILTON.—A. MACALLUM, Esq., *Observer.*															
January.....	30.456	29.078	1.378	48.6	*n. r.*	*n. r.*	*n. r.*	10	37.2	3	9.9	76	7	11	
April	30.007	29.026	1.051	75.0	19.7	39.0	7.9	16	62.48	7	28.73	68	8	3	
June.....	30.014	29.102	.912	90.8	30.1	41.7	4.4	27	80.8	19	53.1	67	7	—	
October	29.938	29.127	.811	83.0	34.2	23.0	4.2	8	76.7	25	40.5	8	14	3	
6. L'ORIGNAL.*—A. McNAUGHTON, Esq., *Observer.*															
January.....	30.203	29 221	.982	38.5	-19.8	46.1	16.4	9	31.0	14	-1.80	79	*n. r.*	*n. r.*	
April.....	30.045	29.118	.927	69.9	3.2	45.2	16.1	17	50.9	8	23.4	69	*n. r.*	*n. r.*	* The abstracts from this Station are incomplete, with the exception of June.
June.....	29.975	29.131	.844	92.4	43.0	38.5	12.1	28	77.7	19	56.2	60	6	—	
October	29.881	29.003	.878	80.7	22.8	48.7	6.4	8	71.8	27	32.3	80	16	*n. r.*	
7. NIAGARA.—THE REV. H. PHILLIPS, M.A., *Observer.*															
January.....	30.354	29.090	1.264	48.4	5.6	31.3	6.5	10	38.9	4	12.1	88	4	13	* During this month, several birds of the order *Insessores* were seen. On 20th, a hawk was seen. 27th, first vessel on the lake.
February....	30.187	29.045	1.142	41.9	1.3	27.7	5.2	18	34.6	14	13.6	84	5	15	
March*	29.920	28.948	.981	45.4	13.5	28.2	3.7	10	40.6	1	21.7	84	7	12	
8. OTTAWA.—THOMAS TUBMAN, Esq., *Observer.*															
February....	30.171	29.108	1.063	37.6	-11.8	32.9	5.0	18	28 4	15	4.3	74	0	10	* Steamboats commenced their trips between Ottawa and Montreal on the latter part of this month.—Tributaries of the river Ottawa very high, overflowing railway tracks, carrying off bridges, &c.
March	39.003	29·050	.953	54.3	9.1	34.0	7.0	23	37.3	1	14.3	73	4	12	
April*.....	30.190	29.115	1.075	71.2	16.3	33.0	9.9	17	58 6	5	26.4	64	9	1	
June.....	30.127	29.145	.982	89.3	40.8	33.5	11.8	28	76.4	15	51.1	56	8	—	
9. PICTON.—F. F. McNAB, Esq., B.A., *Observer.															
January.....	30.242	29.204	1.038	46.1	0.6	35.6	6.5	9	37.7	13	5.5	87	—	15	Mar. 28.—A very bright meteor, moving from south to north, a little east of the Zenith, was seen at 9.30 p.m.
February....	30.054	28.948	1.106	41.7	-5.0	30.8	8.4	18	36.0	25	5.9	86	1	18	
March	29.920	28.993	.927	45.0	5.8	29.5	5.0	10	38 3	1	17.5	82	7	11	
May	29.923	29.144	.779	87.5	34.0	44.6	9.1	17	68.8	24	45.5	74	4	—	
10. STRATFORD.—C. J. MACGREGOR, Esq., M.A., *Observer.*															
January.....	29.259	28.109	1.150	40.1	-17.7	29.3	3.4	9	32.8	14	1.4	87	4	16	
April	29.175	28.130	1.045	69.2	15.8	30.3	4.4	16	62.7	7	26.1	70	7	2	Wild pigeons seen on the 12th of April, and frogs heard on the 16th.
June	29.155	28.295	.860	79.6	33.1	41.6	8.8	28	70.0	19	50.7	71	8	—	
October	29.123	28.227	.896	74.6	23.7	26.5	5.5	8	69.9	25	32.0	84	15	3	
11. WHITBY.—WILLIAM McCABE, Esq., *Observer.*															
January.....	30.072	28.951	1.121	41.6	-4.4	*n. r.*	*n. r.*	1	40.6	4	4.4	74	*n. r.*	*n. r.*	
April	29.870	28.950	9.20	71.8	18.4	38.2	9.0	16	63.8	7	28.4	87	*n. r.*	*n. r.*	
June..... ..	29.725	28.918	1.207	90.8	33.0	40.8	21.8	10	66.9	7	54.6	05	*n. r.*	*n. r.*	
October	29.570	28.365	1.205	75.6	32.6	47.4	27.8	15	65.1	27	39.6	89	*n. r.*	*n. r.*	

NOTE.—No returns were received from eight Stations during the year 1862, viz., Barrie, Chatham, Guelph, Milton, Perth, Peterborough, Port Sarnia, and Woodstock.

4. ATMOSPHERIC PHENOMENON IN TORONTO.

From dusk last evening until after midnight, the heavens presented a beautisul appearance. A belt of light nebulous matter—very much resembling the aurora borealis—stretched along the entire arc of the heavens, from horizon to horizon, in an east and west direction, and passing through the zenith. It may have been a streak of northern light; but it differed from the aurora in this, that it was quite stationary—resembling the tail of a comet rather than the dancing, changeable movement of the aurora. A correspondent writes as follows: Although my observation of it was limited I remarked in those few moments that it arose in the S.E. by E. and stretched across the sky, passing a few degrees south of the zenith, to an opposite point in the horizon, about N.W. by W., and, like the northern lights, was not visible within a few degrees of the horizon at either end of the arc. But the most extraordinary circumstance was its constant motion from its S.E. extremity to where it terminated in the N.W. flowing in a constant stream, and during the short time I examined it, appeared to be divided into two belts, that were occasionally blended together in places, and ever changing their shapes—small streams constantly breaking off and fringing its edge. Now the lowest approach that the aurora ever makes to the earth is computed at 50 miles, or five miles above the limit of the atmosphere, as deduced from crysusenlar reverberations. But this extraordinary luminous belt would not have appeared to be at a greater height than a summer cloud, for the aurora, as generally seen, is an indefinable nebulous light; while the unassisted eye could readily resolve this shining band into its compound particles, and it had more the appearance of a luminous vapour than of an electrical light. Now, although my readings in this branch of science have been limited, and it is

possible descriptions of similar phenomena may have escaped my notice, yet I am of opinion that the magnificent spectacle presented by the heavens last night will form a new record in the annals of meteorology. Doubtless it was carefully watched at our Observatory. * * * Can it be that it was one of Nature's most wonderful means of restoring an equilibrium of electritity between the poles?—*Leader, 10th April.*

5. STRIKING PHENOMENON AT GODERICH.

On Tuesday afternoon last, from four o'clock until sundown, many of our citizens had the gratification of witnessing a singularly beautiful atmospheric phenomenon. At the time mentioned, there was a long thin streak of dark cloud stretching along near the horizon, over the lake, when by some peculiar refraction of the sun's rays, the whole line of the American coast opposite Goderich, about sixty miles distant, was rendered distinctly visible, part of he time to the naked eye. From Port Huron Lighthouse to Point-au-Barque, the Michigan shore hove in sight as an immense panoramic view. Lakeport, Burchville, Lexington, Barshanty, Port Sinclair, Forestville, and Buaretsville, with two large topsail schooners standing in for Point au-Barque, were quite distinct with the aid of a telescope; as were also the clearings and steam saw-mills. Beautiful our noble lake is at all times, but such an exhibition as we have attempted briefly to describe enhances its magnificence tenfold.—*Huron Signal, 17th April.*

6. METEOROLOGY IN LOWER CANADA.

Dr. Smallwood says that the comparative mildness of the month of January, 1863, is not altogether unprecedented in Lower Canada. Numerous observations, extending over a number of years, and recorded by numerous observers, have established the mean temperature of the month of January for Montreal at 14° 80 F.

The mean temperature for the past month was 21° 49. The thermometer from which this mean was deduced was placed in a somewhat enclosed situation at an altitude of about 50 feet above the mean sea-level, and 4 feet from the ground, the bulb being well protected from the radiation produced from the surface of the snow as well as from other objects, showing an increase of temperature of 6° 69 degrees above the established mean, which has been educed, as above stated, from a series of years.

The thermometer during the past month only read below zero on two days. The lowest temperature attained was —11° 0 (below zero,) and the highest reading 43° 2 degrees, showing a range of climatic difference of 54° 2 degrees.

The general range of the Barometer was somewhat high, and on the 10th indicated (after the usual correction for temperature) an altitude of 30 795 inches, the crest reached its maximum at 2 30 p. m. on that day.

In referring to some old meteorological records it is shown that the month of January, 1825, was very similar in temperature to the past month, for the winter of that year was very mild, and but little snow fell up to the 14th day. It was not until the 20th that the ice on the river in front of the city was formed, and on the 24th *traineaux* crossed to Longueuil, but it was not until the 5th of February that a crossing could be effected to St. Helen's Island.

On the 12th of March the channel at the current was formed, and extended on the 16th from Laprairie to Pointe aux Trembles, and on the 26th day (of March) an outward bound vessel left the Port for Montreal.

The year 1843 was remarkable for a mild winter; up to the 20th of January ploughing was done in many places, and some maple sugar was also made.

The years 1536—1745—1803—were also remarkable for mild winters.

7. HOW TO USE A BAROMETER.

The following are a few words of advice by a correspondent of *Chamber's Journal* in regard to taking care of the barometer. He says it is an invaluable fact, and too often overlooked, that the state of the air does not show the present, but coming weather, and that the longer the interval between the barometric signs of change and the change itself, the longer and more strongly will the altered weather prevail; so, the more violent an impending storm, the longer warning does it give of its approach. Indications of approaching change of weather are shown less by the height of the barometer than by its rising or falling. Thus, the barometer begins to rise considerably before the conclusion of a gale, and foretells an improvement in the weather, though the mercury may still stand low. Nevertheless, a steady height of more than thirty inches is mostly indicative of fine weather and moderate winds. Either steadiness or gradual rising of the mercury indicates settled weather, and continued steadiness with dryness foretells very fine weather, lasting sometime. A rapid rise of the barometer indicates unsettled weather; a gradual fall of one-hundredth of an inch per hour indicates a gradual change in the weather, and moderate rising of the wind; several successive falls, to the amount of one-tenth of an inch, indicates a storm eventually, but not a sudden one; and a gale if the fall continues. These storms are not dangerous, as they can be long foretold; but a sudden fall of one-tenth of an inch betokens the quick approach of a dangerous tempest. Alternate rising and sinking (oscillation) indicates unsettled and threatening weather. When the barometer sinks considerably, much wind and rain will follow—from the northward, if the thermometer is low for the season; from the southward, if high. For observing barometric changes, the barometer should be placed at the eye level, out of the reach of sunshine and of artificial heat, as of fires, and out of gusts of wind. It should be set regularly twice a day by a competent person. A card should be accessible close by, and on it should be registered the indication at each setting.

8. NATURAL BAROMETERS.

All things, animate and inanimate, are more or less manifestly affected by the weather, and the recognition of the degree and mode in which they are affected constitutes the collateral field for systematic research to which we have referred. A host of facts indicative of the influence of the weather upon different objects, and foreshadowing changes in its character, are familiar to popular observation, and their systemisation would alone constitute a work of no mean, and not a little curious interest. An old scar, a rheumatic joint, or corns, are oft as sensitive to approaching change of weather as a barometer. "Aches and corns," says Lord Bacon, "do engrieve (afflict) either towards rain or frost; the one makes the humors to abound more, and the other makes them sharper." Hitherto corns have commonly been looked upon as ills to be ashamed of rather than otherwise. But are they not susceptible of a certain degree of dignity? We should commend to the afflicted the consideration, whether a serious study of the varying sensitiveness of their evil in connexion with the barometer and thermometer, would not be as promising a question in physiology as many seemingly of more recondite character. When the husbandman sees the down of a colt's-foot, dandelion, or thistles, floating away in the absence of winds, he looks for rain; and the denizen of coasts knows that wet and broken weather is not far off, however promising the sky may be, when the long strips of seaweed lying high and dry on the beach, or hung behind the door, lengthen and become as flexible as wet leather. The landsman anxiously scans the sky and seeks shelter when he sees the heifers prick their tails, or his cattle leave their feeding and "back against the hedge." When ducks and drakes shake and flutter their wings as they rise, when young horses rub their backs against the ground, when sheep bleat and play or skip wantonly, when swine are seen to carry bottles of hay or straw to any place and hide them, when oxen lick themselves against the hair, when the lamps or candles sparkle, when soot falls down the chimney more than common, and when frogs croak, the prudent farmer expects rain; and the squire dons his overcoat and tucks his umbrella under his arm when he hears the crows unusually obstreperous, or feels the marble statue of his hall damp, or sees his family monument in the church covered with a clammy dew. The innkeeper shakes his head and predicts when his sign creaks louder than ordinary; and the stable-man and kitchen-maid know that wet is at hand, when the odor of the common sewer strikes disagreeably their nostrils. The tourist on the Welsh coast will be rejoicing in the glories of a cloudless day and the wondrous beauty of the ocean as it stretches away to the horizon, or breaks into surf upon the neighbouring cliffs; while the beachman who is listening to the ceaseless roar of the rushing water, will hear in it the first warning of a coming storm, and pray for the safety at sea.—*Social Science Review.*

9. NATURAL WEATHER INDICATOR.

Mr. L. S. Ullman, lately a resident in the State of Tennessee, has brought with him to Canada a very singular Natural Weather Indicator, which cannot be better described than by making an extract from an article on the subject, in the *Nashville Journal of Medicine and Surgery* for November, 1858.* The editor says:

"We requested Mr. Ullman to send specimens of his plant to several American *savans*, with a request that they should test its powers, and in the meantime to write out the circumstances which led him to its discovery, and every thing connected with it. Both of these requests Mr. Ullman has complied with, and we desire to

* Mr. Ullman is now a resident of Toronto, and can supply these Natural Weather Indicators for one dollar each. For list of Meteorological Instruments at the Educational Depository, Toronto, see page 64.

lay his description before our readers, to be followed by the opinions of the learned gentlemen who have examined this wonderful plant :—

"Seated in front of a bazaar early one morning, an Arab from the desert accosted me, presenting at the time with his compliments, a bunch of beautiful flowers. After making some purchases he departed, and I, examining my rare exotics, was struck with the curious appearance of one singularly convoluted and twisted little plant, yet without more thought, being called away, I dropped it upon the water stand. Upon returning, I was surprised to find that this little plant, singularly twisted up when placed upon the wet table, had now become elongated, and almost perfectly straight. Picking it up, I took it to the door to examine it, and upon the sun's rays falling upon it, it speedily returned to its formal spiral shape, and became almost immediately as twisted and curled as when first it drew my attention."

Mr. Ullman having gone in quest of the singular plant, says :

"Viewed from a distance on the plains, the place of its growth, presents a rugged, bold, dreary outline—like an ancient castle—a ridge of hills rising above the sandy plain, and presenting to the eye no vegetation save this rare plant, with here and there clusters of a species of fern, which rising abruptly now and then above the general height of this ridge of hills, adds to the dreary aspect of the place, and were it not that the eye is relieved by the beautiful orange-yellow, pinkish flowers of the 'talisman,' one can conceive of no place more lonesome and dreary.

"Here we pitched our tent, and upon the following day, having filled a sack with this wonderful natural weather prophet, we started out upon our return, and in due time arrived at Damascus, in Tyria, with our treasure.

"*Botanical Description.*—The relative abundance and the vigorous growth of this shrubby plant was greatly influenced by the character of the rocks with which their deeply penetrating roots came in contact. It grows to the height of three and a half to four and a half feet in attaining its maturity. My guide, in Arabic language, called this plant *chahajin, chahan* (Diviner, sooth-sayer; *Hariolous* or Prognosticator.

"This plant has thick, tuberous, long roots, from twelve to sixteen inches in length, with tangled fibres, starting in every direction into the scanty soil upon which it grows. From each root spring from one to three hundred stalks or stems, each stem having from ten to fifteen flowers, and every flower produces only one weather-prophet or talisman, which grows in a twisted natural form, just as it is presented now. The stalk is one inch in diameter in the perfect plant, and is generally succulent, with a very thick epidermis. I learned from an Arab, that at certain seasons of the year it casts off its hyprometrical portion with a crackling noise, which can be heard at a considerable distance.

"The seeds of this botanical curiosity are the size of a small grain of rye, of a green colour, and generally containing two in each capsule. Placed in water, they change into a light brownish tint, and upon being split in their centre, they present a light tongue-like protuberance. The desert produces a curious spotted insect, about the size of a May-fly, (*cockchafer*), that delight to feed upon the seed, and hundreds of the plants are desicated annually by them.

"The young plants bloom within six months of their springing; and casting their fruit, flowers still continue to grow until they reach their maturity, which requires some years. Corresponding with the uniformity of the climate throughout the year, is the vegetation of the *chahajin chahan*. It has no winter dress, but is an evergeen, and of slow growth.

"The whole plant indicates the approach of rain by drooping, and the flowers fall at its coming, as the leaves in autumn are blown by the winds. The *chahajin* bloom of the *chahan* is beautifully variegated, the white, bluish, greenish, golden-yellow and crimson flowers, eminently conspicuous in the sun's rays, the colours profusely intermingled. Under the bright meridian sun, the blue were most abundant, and these being intermingled with the dark and bright green of the hairy leaves, gave a combination of colours peculiarly rich and attractive. This confusion of colours is the effect of the sun's rays upon the petals, and is reversed in the after part of the day, so that conclusions formed by a traveller as to the botanical character of the districts through which he passed, might, if he depended upon a cursory observation, lead him wide off the truth."

Professor Riddell, of New Orleans, says, in a letter to Mr. Ullman concerning this plant :—"It is wonderfully delicate, and, I believe, reliable." Dr. Owen, late Professor of Geology and Chemistry in the University of Nashville, says :—"After carefully adjusting six of the seed vessels of your plant in their boxes, and making the Indices agree with each other at a given point ('change' of the adil), on a day of average moisture in the atmosphere, I found them during many months peculiarly sensitive to all hygrometrical changes, and acquired confidence in their indications because they agreed. I furthermore compared them for the same period with a hair hygrometer, and part of the time with Mason's hygrometer (the wet and dry bulbs), and found the plants gave the same indications as those instruments." Professor J. Lawrence Smith says :—"I have your beautiful little instrument, and have been regarding it with interest. It makes a remarkably sensitive hygrometer, and is more convenient for this purpose than any artificial arrangement I know of." Professor Henry, of the Smithsonian Institute, says :—"It appears to be peculiarly sensitive, and gives a greater range of motion than either the animated oat or ordinary cat-gut." Professor Draper, of the New York University Medical College, says :—"I have had the hygrometer hung up in my laboratory since it arrived, and found it to move in the manner you expressed."

As for ourself, we have been closely watching one of Mr. Ullman's instruments for more than a year, and are convinced that it is in every way altogether superior to any contrivance for hygrometrical observations known. Daniell, in his meteorological essays, says :—"The expansion of thin cross-sections of box and other hard wood—the elongation of the human hair, or a slice of whalebone, and the untwisting of the wild-oat, of cat-gut, of a cord of linen thread, and a species of grass brought from India—have at different times been used with various success. But the instruments so formed are either extremely dull in their motions, or if they acquire greater sensibility from the attenuation of their substance, they are likewise rendered the more subject to accidental injury and derangement; and all of them appear to lose in time, insensibly, their tone and proper action." Lieutenant Maury thinks the India grass mentioned by Mr. Daniell is the plant of Mr. Ullman. (Letter to Mr. Ullman.) This is a very great mistake. It is no more like the India grass than it is like a section of box-wood, human hair, or whale-bone. Nor do we, after a number of experiments, believe that it is subject to the objections urged by Daniell against these organic hygrometers. The one in our study is as sensitive now as it was more than a year ago. The moisture of an infant's breath will instantly put the index in motion. Mr. Ullman has one that he has watched for eighteen years, and it is as sensitive now as those mounted on yesterday.

There is no apparent reason why such an instrument should not last a thousand years. It is the most simple of all imaginable contrivances capable of securing important ends. The seed vessels of a plant, remarkably delicate, twisted so as to make two revolutions and a half, are fastened at one end to the bottom of a little circular box of wood turned out of a solid piece, and about the size of a large pill-box.

The other end projects perpendicularly from the centre of the bottom of the box, and several lines above the upper edge of the box. A beautifully lithographed dial plate, quite tasteful and ornamental, having a hole in the centre, is permanently adjusted to the top of the box—the perpendicular end of the plant projecting through the perforation in the dial plate. Upon this projected end is fixed a delicate index of bronzed paper. The slightest increase of moisture in the atmosphere induces the plant to uncoil, thus putting the index in motion.

The aqueous vapour of the atmosphere is the result of evaporation, and rising and being diffused in the air, is necessarily lighter than that medium. The specific gravity of the atmosphere, as compared to that of aqueous vapour, is as 1.000 to 0.625. As evaporation is alone the result of heat, the temperature of the air will always determine the capacity of the atmosphere for aqueous vapour. When this capacity, at any temperature, is exhausted—when the air can hold no more—if evaporation continue, the excess must appear as fog. This, when it occurs, is the dew-point, and is marked by the thermometer. The greater the temperature of the air, the greater its capacity for aqueous moisture; and when the dew-point occurs at a very high temperature, the atmosphere is almost unfit for respiration. The weather is said to be sultry. The light dews of spring, and the heavy dews of autumn, are explained by the difference in the hygrometrical states of the atmosphere at these seasons. For hygrometric observations, Mason's hygrometer has superseded all others. All scientific men are familiar with it. It indicates at once the temperature of the atmosphere, and its hygrometrical condition. For the purposes of scientific men it answers admirably. But it can never become a popular instrument with farmers, mechanics, and artisans. In the first place, it is expensive. Again, it is liable to get out of repair. The silk which covers the wet bulb requires frequent renewing, and the same is true of the water-thread. Distilled water is necessary to replenish the fountain from time to time. The fountain is often broken by the freezing of the water.

With an ordinary thermometer and Mr. Ullman's beautiful little instrument, the farmer would have but little difficulty in anticipating storm, rain or sunshine. The two—a common thermometer,

and Ullman's hygrometer—would enable the farmer far better to anticipate the weather, than he could by any familiarity with the best barometer. The sudden fall of the mercury in the barometer will fortell wind or rain ; but no one can tell which until he ascertains the hygrometric state of the air. If it be *dry*, wind will come ; if the atmosphere is damp, there will be rain. So the farmer noticing the mercury high in the thermometer, and turning to his hygrometer, perceives a large amount of aqueous vapor indicated, will know that rain is at hand ; while on the contrary, however hot the weather, if the air is dry, he will not look for rain. Mr. Ullman's little instrument requires no care or attention. Hang it up on a nail in a verandah or hall, and we believe it would run one hundred years with the greatest accuracy.

10. ANIMAL BAROMETERS.

The remarkable forecast manifested by birds and beasts of changes in the weather is familiar to all intelligent observers of their habits. This faculty seems to rise above instinct and to attain nearly to the quality of reasoning. It is a wonderful exercise of a beneficence of that Providence which does not allow the sparrow to go uncared for in preparing these helpless and dependent creatures for the changes and vicissitudes they must encounter. The fact is always recognized, but the agency by which this intelligence is imparted by the Creator is not so readily comprehended. The experience and observation of man furnish him with only vague and uncertain means of anticipating such changes, while the signs afforded by these humble creatures enable us to form opinions almost infallible. How do they possess or exert this attribute? Immediately approaching changes from wet to dry, from hot to cold, or the reverses, may probably be indicated to the brute creation by atmospheric or electric influences upon their nervous system. This theory, however, will not account for the possession of this apparent intelligence of directly impending events, such as a storm of wind or rain, but does not explain the more surprising exercise of the faculty. Not only the beaver and other animals which we are in the habit of classing in the higher order of brute intelligence, but those of inferior instincts or sagacity, as the common muskrat and swine, indicate by their habits and arrangements the general character of the weather for an approaching season. We may judge very accurately by the indications they furnish in autumn of what will be the prevailing weather of the coming winter. The squirrel seems to enjoy a foreknowledge, upon which he graduates the extent of his labours in garnering up the supplies for his winter quarters. The habit is, I believe, exhibited by every creature in a normal condition.

The question, by what instrumentality does Providence communicate this power to the brute creation, is of much interest, and worthy, I think, of philosophical investigation. My attention has been just now attracted to this subject by an exhibition of the organ in the hog known to farmers as the milt. As long as I can remember, I have known the size and form of this organ to be regarded as an index of the character of the ensuing winter. I received the idea from my father, who derived it during the last century from the Dutch burghers of Albany, but I find it now familiar to most farmers. My father observed this sign for fifty years, and he often remarked that it had never deceived him. It is certain, I believe, that the milt varies in its form and dimensions from year to year, and that there always prevails a singular uniformity in the appearance of this organ in all swine slaughtered the same season.

Assuming these facts to be determined, do they not afford some light towards the solution of the questions I have presented? Can we not, by the data they present, detect a faint glimmering of the plan by which this special scheme of Divine wisdom and mercy is effected? If the form of the hog's milt enables man to judge of the mildness or severity of a season, months in advance, does it not impart to the animal the same perception of the future? This creates, perhaps, the instinct or faculty which often seems so marvelous. If this is true in respect to swine, the same cause may operate with similar results upon some organ in other animals and impress upon them this foreknowledge of the seasons. These organs, acting possibly upon the nervous system or brain, may stimulate faculties which enable the animal to know or *feel* how he shall prepare for his approaching wants, and produce those acts and habits from which man derives his auguries of the future.

These are crude speculations, but the thought and the facts deserve consideration.—*New York Observer.*

11. METEOROLOGY FOR THE FARMERS.

Some time ago, when Lieutenant Maury was in England, he was consulted on behalf of the government there on the subject of giving, for the benefit of shipping, warning by telegraph of approaching storms. His opinion as to the importance and value of the magnetic telegraph as a meteorological implement, which has for several years been so often expressed, was reiterated and a detailed account of the plan given in a letter addressed last December to the Royal commission on Light Houses, &c., showing how, through them and the telegraph, timely warning might be given of many a storm. The plan is now in practice there : and on the 7th ult., the Admiral in charge of this new system of meteorology, telegraphed to the principal ports of the realm to look out for a storm on the 9th. And sure enough, those shores were on the 9th visited by one of the most furious destructive storms ever known.

These warnings are as important to the farmers, and indeed to all classes of citizens whose pursuits or avocations are at all affected by the weather, as they are to ships and seamen. We hope the farmers will take the matter up, and encourage this move; for by discussing it in their clubs, and before their Agricultural Societies, the plan will find such favor with the people as to ensure an order by the government for its adoption.

The following in commendation of it, is from a recent number of "The Scotsman," of Edinburgh :

CAPTAIN MAURY, OF THE WASHINGTON OBSERVATORY, ON THE PREDICTION OF STORMS ALONG OUR COASTS.

The lately appointed British Royal commission, to inquire into the whole subject of the purposes, uses, construction and management of lighthouses, has had a question before it which no previous Lighthouse Board, we believe, ever had, and which may fairly be taken as a sign of the progress of physical science in the age in which we live. The question stated formally is : "In the event of telegraph wires being laid down from the Board of Trade to each lighthouse, what sort of meteorological information should be transmitted for the purpose of being signaled to passing ships?"

Answers to this question have been sought by the Commission from the most eminent men of science in this country; and not satisfied with such information as our own island could supply, they have sought advice and counsel from an eminent American, who has made the dangers of nautical life a subject of careful study. This gentleman, we need hardly say, is Capt. Maury, of the United States Navy, known in reading circles as the author of the "Physical Geography of the Sea," and known and honored in every sea that is sailed over by ships, either European or American, for his admirable "Wind and Current Charts"—charts which are founded on a comparison and systematic discussion of a larger number of nautical observations than, we may safely say, were ever before collected, compared and discussed by any man, living or dead.

The subject came before Captain Maury at a time when the critical condition of his country had claims upon his attention, which might have excused him had he postponed its consideration. But no sooner did the communication of the British Royal Commission reach him, than he entered into the subject earnestly, and wrote out a copious and instructve reply, which we are unable to insert. But it may interest nautical readers to learn that he is anxious to seethe plan adopted, of communicating the approach of storms by signals to ships from every lighthouse. He holds, that, though storms cannot be predicted in all cases, they may in many; and this by the establishment of a central office to which meteorological observations should be transmitted by telegraph from a wide circle of surrounding stations, and compare together. He points out that, taking a general view of the world, the coasts of Britain are peculiarly dangerous, for they seldom fail to present a lee-shore to the sailor in any and every wind that blows.

On the other hand, the geographical position of these islands is such as would enable them to give early and valuable warnings to countries eastward, of western storms. Predictions of weather founded on observations at any one point would exhibit uncertainty and confusion, but when derived from observations at many and distant points, instantaneously communicated and combined, order and sequence appear, and the progressive march of special storms can be traced. Hence a central meteorological office is in a vastly more favorable position for judging of the weather than any single ship, though steered by a scientific commander, amply provided with barometers and thermometers. To every ship, therefore, when it comes into the neighborhood of our iron-bound shores, after its solitary voyage through the watery waste, it would be one of the greatest boons conceivable if each lighthouse hung out a signal, intimating what Captain Maury well calls "the invisible dangers of the atmosphere," thereby indicating to the mariner from what quarter he may presently expect a storm to break forth, which coast will be dangerous, and which safe for him, to be found in the neighborhood of——.

Had any such system been in operation when that magnificient Australian liner, the Royal Charter, with its hundreds of passengers, in sight of our shores, after this long voyage, with its precious freight from the other side of the world, the dire calamity which ensued could never have occurred. That sad wreck shocked the public mind for a moment grievously, yet it is but a drop in the great aggregate

of the nation's losses in the same manner, and from the same causes as the public notifications of more than a thousand wrecks in the year testify. Is it not a duty then to endeavor, by such means as science puts into our hands, to lessen the number of such calamities, and shall we not unite our efforts with those of the public-spirited American who gives us the aid of his abilities and his immense experience in the laudable enterprise.—*Ohio Farmer.*

II. Papers on Natural History.

1. SCHOOL BOYS AND BIRDS IN AUSTRALIA.

The Board of Education for Victoria, in their annual report to the Governor, for 1861–62, thus refers to the discouragement which they have given to the school boys' cruel habit of destroying birds: "Considerable mischief having been caused by the wilful destruction of birds and plants by children, we have issued a circular calling the attention of teachers to the subject; and in the case of our model schools, we have directed that the masters shall frequently assemble the children, for the purpose of pointing out to them the wrongfulness of such conduct; and we have further ordered, that any boy so offending shall be expelled from the school."

2. LECTURE ON THE UTILITY OF BIRDS.

Mr. A. Rimmel delivered a lecture in the Lecture Room of the Natural History Society of Montreal, on the 13th of February, 1863, on "The Utility of Birds to Agriculture, and the desirability of endeavoring to prevent their destruction on the Island of Montreal." The lecturer commenced by reading a portion of documents issued by the Minister of the Interior for France, in favor of the preservation of birds inimical to the insects destructive to the field, orchard and forests. The larvæ of the beetle were injurious to plant life, as they eat all day and night, consuming twice their own size in a day. The usefulness of the lady-bird was next touched upon in reference to its destruction of plant lice, and service in the green-house. After giving a brief account of some of the calamities produced by the ravages of caterpillars in the Old Word, the lecturer declared that America had suffered from the destructiveness of insects as much as any country. The winter here was favorable to their life, the weevil and other insects taking shelter in the earth from birds which were always too few in spring for the multitudes of the former. The damage done by the caterpillar on the Island of Montreal was immense; it formed upon trees a small ring, every one of which contained 300 caterpillars. He (the speaker) had counted upon one tree 100 rings, which would give 30,000 insects. The driving away of birds had in many instances been productive of ruin to fields and orchards which were then swarmed with insects. The robin was a most useful bird in England, on account of the number of insects it destroyed. A weevil would deposit 70 to 90 eggs in a grain of corn, and one weevil would destroy a whole ear, so that 3,300 grains of corn might be saved in one day by one bird. The crow had been looked upon as an enemy of grain, but it was known that its search was for the larvæ of the wireworm and such other pests. The lecturer next spoke of the value of the fly-catcher and wood-pecker, which was an enemy to the small green caterpillar that infested the currant bushes. Last season was very destructive to the apple trees around Montreal, and he had no hesitation in saying the absence of birds was the principal cause. All the trees on the outside of his (the lecturer's) orchard had been destroyed by caterpillars, which came over in one night. The owl and Canada robin were very useful birds, and should not be exterminated. The wholesale destruction of birds on the Island of Montreal was strongly condemned, as it precluded the hope of ever getting rid of insects. Every morning guns might be heard firing, at the Mountain, and although it was said birds were not in all cases killed, yet it was worse to scare them, as the noise drove away others. The lecturer concluded an instructive lecture by suggesting that the Mountain be taken within the city limits, and that the present law against using firearms in this city be enforced. This he had no doubt, would be the best means of preventing the mischievous and wanton destruction of our feathered benefactors.

3. PROTECTION OF INSECTIVOROUS AND OTHER BIRDS, BENEFICIAL TO AGRICULTURE.

Mr. Joly has introduced the following excellent Bill into the House of Assembly. We sincerely hope it will pass—and if passed, enforced. The Hon. Mr. Portman introduced a bill of similar tendency last year. (See *Journal of Education* for August, 1862, page 119.)

Whereas, the destruction of insectivorous birds is prejudical to agriculture, and the killing and capture of singing and other small birds is an useless and cruel practice; Therefore, Her Majesty, &c., enacts as follows:

1. It shall not be lawful to shoot, destroy, kill, wound or injure, or to attempt to shoot, destroy, kill wound or injure, any kind of bird whatsoever, save and except eagles, falcons, hawks, wild pigeons, ortelans, snow birds and king fishers,—between the first day of March and the first day of August in any year.

2. It shall not be lawful to take, capture, buy, sell, expose for sale or have in possession, any kind of bird whatsoever, save and except the kinds above excepted; or to set either wholly or in part, any net, trap, spring, snare, cage, or other machine or engine, by which any kind of bird whatsoever, save and except the kinds above excepted, might be killed or captured, between the first day of March and the first day of August in any year.

3. It shall not be lawful to take, injure, destroy, or have in possession, any nest, young, or egg of any kind of bird whatsoever, except of eagles, hawks, falcons, and kingfishers, between the said first day of March and the said first day of August in any year.

4. The violation of any provision of this Act shall subject the offender to the payment of a penalty of not less than *one dollar* and not more than *ten dollars*, to be recovered in a summary manner by summons before one Justice of the Peace, who shall award the penalty, the offender may be condemned to pay the prosecutor, with all fees and costs incurred; and in default of immediate payment thereof, the offender shall be forthwith imprisoned in the nearest common jail, for a period not less than two and not more than twenty days at the discretion of such Justice.

5. Any person may seize on view any bird unlawfully possessed, and carry the same before any Justice of the Peace to be by him confiscated; and every person is authorized to destroy all nets, traps, snares, cages, or other machines or engines, set wholly or in part, whereby any kind of bird whatsoever, save and except the kinds above excepted in the first section of this Act, might be unlawfully killed or captured.

6. No conviction shall be annulled or vacated for any defect in the form thereof or for any omission or informality in any summons or other proceedings under this Act, so long as no substantial injustice results therefrom.

7. The present Act, and all its provisions shall be so construed as not to annul or vacate any provision of the Game Acts of Canada, or any amendments thereto.

4. BIRTH OF A SALMON.

The fish lies in the shell, coiled round in the form of a bow, and the greatest strain being at the back it is the first part that is freed; and, after a few struggles, the shell is entirely thrown off with a jerk. The appearance of the fish at this stage of its being is very interesting; what is to be the future fish is a mere line, the head and eyes large, the laeter very prominent. Along the belly of the fish, from the gills, is suspended a bag—of large dimensions in proportion to the size of the fish. This bag contains a yolk, which nourishes the fish for six weeks, after which it must be fed. For a few days after hatching, the two dorsal fins are apparently joined, and the two pectorals are very large in proportion to the rest of the animal. The little creature, not requiring to seek its food, moves very little, and, when it does, swims mostly on its side, owing to the large size of the bag, which gradually becomes absorbed, and in a short time the fins get separated, and the fry assumes the general aspect of a fish. In its first stage it is translucent, but in a short period it takes on the parr color, and the tranverse bars can be easily seen, and the tail begins to get much forked. At the bag stage of their existence they are very easily injured; a displaced stone in the gravel in which they are lying, coming against them, destroys them; and although they are no longer the prey of insects, all kinds of fish and fowl are their enemies, and great must be their destruction in rivers where their enemies are numerous. As we have previously stated, in about six weeks the bag is absorbed, and the fish is a fingerling, or part, from one inch and a half to two inches long.—*Experiments in Artificialb reeding in the Tag.*

5. NEW SALMON RIVER IN IRELAND.

A fish-walk has been made for two miles over the ground between Lough Corrib and Lough Mask, in the county of Galway, at a cost of £650. By this means salmon are now enabled to pass up and down freely. The *Galway Express* says:—"Within the past four weeks Mr. Miler has collected and deposited no less than 770,000 salmon ova in the streams of Lough Mask; in addition to this large supply, Mr. Miller has conveyed forty adult salmon alive a distance of twenty-three miles in a large tub of water, and, by frequently

renewing the water on the way, they arrived as lively at the end of their journey as they were at the beginning. Those were the first salmon that had ever been known to inhabit the river Robe, a tributary of Lough Mask, which covers an area of ground thirty miles by ten."

III. Papers on Practical Education.

1. FAULT-FINDING AT RECITATION.

The child should be taught to manifest a due degree of *independence in recitation*. There are, however, two extremes here, and chiefly attributable to the practice of the teacher. We shall endeavour to guard him against both. The one is a blind adherence to books and customs, and a cowardly or indolent independence, which forbids every attempt to think for one's self: the other is an egotistic assurance, or self-conceited effrontery, that sets aside all books and definitions.

It is a disposition and a habit some teachers fall into, of finding fault with authors and every body else whose opinions do not agree with their own. They seem to think it a mark of wisdom to quarrel with definitions and rules. They build up their reputation with the bones of their demolished (?) adversaries, and often build upon their follies and weaknesses. They live by plunder. They are wiseacres. They are continually making discoveries that others have made long before them, but which *their* better judgment led them to see were no discoveries. They can see but one side of an argument, and that is their side, and unfortunately it is too frequently the wrong side. Such, for example, are those who must live by excitement, always straining to make the world believe that every thing has been going wrong until they happen to be born. They do not spend their time and energies so much in teaching the sciences as in finding fault with them; and hence weaken the confidence of the scholar that needs strengthening, unbend the energies that need stimulating, and unsettle and distract the purposes and knowledge that may have been half formed.

The other extreme is scarcely less detrimental to true progress, but not so dangerous. The one is absolute destruction; the other is simply a barrier. Whilst the first cuts loose from all mooring, carries no anchor, and ignores all faith save what its own dogmatism invents, the other remains bound fast to the ancient customs, and dares not believe and practise any thing that does not conform to the creed. The one is rapid radicalism; the other, rank conservatism. The one is meteoric, or gaseous; the other is fossiliferous. Both are destructive to healthy growth of mind.

The effects of either of these extremes upon the pupil can easily be imagined. They become either pedantic, self-conceited, and opinionated, or obsequious, stupid and parasitical. But there is a happy mean between the two extremes, and that the teacher should endeavour to follow. While I would not recommend a blind subserviency to the old usages, and to texts and definitions as laid down by authors; yet I would say, agree with authors just as far as possible, lest your distrust and skepticism lead those who have less judgment too far from a settled belief, and lest you distract the interest and attention so necessary to progress.—JOHN OGDEN, *in "Science of Education and Art of Teaching."*

2. VALUE OF A VISIT TO THE SCHOOLS.

Read the following excellent suggestions about schools, by the *American Agriculturist*:—"The man or woman who drops into the school-house often, and shows an interest in the pupils and in their comfort, is a public benefactor. Both teachers and scholars are encouraged to good behaviour and extra efforts. Who does not remember the stimulus to the whole school, of a visit from a parent or other person? A school visited two or three times a week—the visitors insisting that no show or change of programme be made, but that all things go on in regular course, will generally be twice as prosperous as the School never visited. No one should leave others to attend to this matter. The public school should be the pet and pride of every good citizen of the district. Visit it often as a recognized friend, not as a morose critic. If the good deeds be sought out and appreciated an occasional hint for improvement, in a kind tone, will be kindly received and acted upon by both teachers and scholars. Speaking evil or disrespectfully of the teacher in the hearing of your children, or to those who will repeat the words in their presence, inflicts a lasting injury upon them. Get the best teacher possible, and uphold him, or her, so long as employed for the children's sake. We have known a school deprived of all efficiency by a thoughtless word about the teacher dropped by a parent in the presence of his child, and repeated by the child to other scholars."

IV. Papers on the Prince of Wales.

1. THE LAUREATE'S ODE.

The following is the Ode written by Tennyson on the Royal marriage:—

Sea-kings daughter from over the sea,
Alexandra!
Saxon, and Norman, and Danes are we,
But all of us Danes in our welcome of thee,
Alexandra!
Welcome her, thunders of fort and of fleet!
Welcome her, thundering cheer of the street!
Welcome her, all things youthful and sweet!
Scatter the blossom under her feet!
Break, happy land, into earlier flowers!
Make music, O bird, in the new budded bowers!
Welcome her, welcome her, all that is ours!
Warble, O bugle, and trumpet blare!
Flags, flutter out upon the turrets and towers!
Flames, on the windy headland flare!
Utter your jubilee, steeple and spire!
Clash, ye bells in the merry March air!
Flash, ye cities, in rivers of fire!
Welcome her, welcome the land's desire,
Alexandra!
Sea-kings' daughter, as happy as fair,
Blissful bride of a blissful heir,
Bride of the heir of the kings of the sea,
O joy to the people, and joy to the throne,
Come to us, love us, and make us your own:
For Saxon, or Dane, or Norman we,
Teuton, or Celt, or whatever we be,
We are each all Dane in our welcome of thee,
Alexandra!

2. THE ROYAL MARRIAGE.

THE RECEPTION OF THE PRINCESS ALEXANDRA.

Shortly after ten on the morning of Saturday the 7th March, the Royal yacht, *Victoria and Albert*, brought her head down the river opposite the pier at Gravesend, and presently came alongside the pier. The Princess, dressed entirely in white, with the exception of a few coloured flowers in her bonnet, left the Royal cabin, and came over to the starboard side of the yacht. Here she was received with tremendous enthusiasm, which she acknowledged with an expression of pleased astonishment and wondering pleasure at her reception, bowing from side to side, and every now and then speaking earnestly to her mother, apparently directing her attention to the extraordinary scene of delight. "Occasionally," says the *Times* report,

"As the port-side spectators grew deafening in their cheers, as a gentle reminder that they were there as well as the visitors on the pier, she went to that side also, but, as may be guessed, her appearance did not stop the cheering. Nothing did, in truth, till she withdrew at intervals altogether, but not for long. Her white bonnet and delighted face were soon to be seen peeping round from some unexpected window, when in a second she was discovered, and cheered, till she came forward and bowed, and had to go to another."

Presently the signal-bells announced the arrival of the Prince of Wales in Gravesend, and the sixty young ladies who had been chosen to strew flowers before the bride elect, filed two and two from the waiting-room, and ranged themselves—clad in red and white, the colours of the Danish kings—on each side of the path down the centre of the pier. At five minutes to twelve, the Prince arrived, in a plain morning dress, and with a face radiant with happiness, traversed the pier with rapid steps. For the loyal people of Gravesend was destined the most interesting event in the day's history.

"The Princess watched his coming from the window, but, as he neared the vessel, first came to the door, and then, after a moment's hesitation, out upon the deck towards the Prince, who hurriedly advanced, and, removing his hat, gave her an earnest, hearty kiss, in the presence of all the assembled thousands, who thereupon went into such ecstacies of delight and applause as made the shores of the river ring again."

We make no attempt to describe the splendour of the scene;—the river covered with steamers and boats decked with flags, the pier and the shores alive with thousands upon thousands of spectators; "a scene of such enthusiasm, and yet of such impossible beauty from the numbers which made up the display, that we cannot expect to look upon its like again in England for many years to come." At a quarter-past twelve the Princess re-appeared upon

the deck, wearing a mauve-coloured silk, with a richly embroidered violet velvet mantle, and bonnet of the same colour, and taking the Prince's arm, came ashore on the pier at a quarter past twelve, preceded by a brilliant suite, and followed by the members of her Royal family. Again a wild burst of enthusiasm welcomed her, when the Mayoress, Mrs. Sams, advanced to meet her, and presented her with the bouquet which had been subscribed for by the ladies of the town. This she received, thanking the Mayoress in good English, and shaking hands with her; and then, the sixty young ladies throwing their flowers before them, at them, and over them, she and the Prince proceeded to the end of the pier—the ladies clapping their hands, the gentlemen shouting and crying, "God bless them," and everybody apparently out of their senses with joy. There they received the addresses of the Corporation.

So much for the pier at Gravesend. The Royal progress through the streets was accompanied with equal enthusiasm. At ten minutes to one the Royal train left Gravesend, and proceeded to the Bricklayers' Arms at the rate of eight or nine miles an hour through the stations, which were thronged with visitors and guards of honour, amid Royal salutes and *feux de joie*, the route being lined with crowds, which became more and more dense as it approached the metropolis.

The station at the Bricklayers' Arms was a perfect marvel of magnificence. Wherever a garland or a human being could be put they were there. We should quite exceed our limit were we to attempt the faintest description of the display of taste and beauty which was provided at this point for the reception of the Princess. His Royal Highness the Commander-in-Chief, the Duke of Saxe Coburg, the Prince of Prussia, and his Highness the Count of Flanders, occupied a foremost place, apart from all the other personages in waiting, ready to give the first welcome to the Royal bride. At twenty minutes to two the train drove slowly up to the middle of the platform, and a thrill of excitement ran through the assembled company, every one standing up uncovered. As the Prince alighted, with the Princess leaning on his arm, "radiant with youthful smiles and innocent gratification," they were welcomed by a hearty burst of cheers and waving of hats and handkerchiefs. Bowing low and repeatedly in response to this greeting, the youthful pair passed to the refreshment-room. Here luncheon was served and addresses from the Lord-Lieutenant, High Sheriff, &c., of Surrey, presented without being read. The gracious and sweet manners of the Princess on this, as on every other occasion, and the frank, manly pride of the Prince, won all hearts.

At two o'clock his Royal Highness the Commander-in-chief led the way to the Royal carriages, and the procession set out, the Lord-Lieutenant of Surrey, the Members for the County and Borough, the High Bailiff, the Lord Mayor and Sheriff, with their retinue, leading the way through banks of spectators; flags, garlands, arches, banners, streamers, floral devices, and the most deafening acclamations, and ringing of church bells, till it reached the foot of London Bridge. For several days previous the bridge had been almost impassable, so thronged was it with visitors to see the preparations the City had made for the entrance of the bride-elect. The parapets were ornamented with statues of the Kings of Denmark from the earliest period, affixed to Danish standards thirty feet high, surmounted by gilt figures of ravens and elephants, the Danish national emblems. Between these were tripods of burning incense. At each end of the bridge were pedestals bearing statues of Fame, surrounded by Danish warriors bearing the "Danebrog," or national flag. At the entrance to King William-street a triumphal arch was erected sixty feet high, supported by sixteen Corinthian columns of Saxe-Grammaticus; Holberg the poet; Thorwaldsden the sculptor; and Juel the painter—all Danes. As far as the eye could reach on either side of the bridge, the shipping and the houses were decorated with flags; and every conceivable place, even the cage on the top of the Monument, swarmed with spectators.

About half-past two o'clock the procession entered the City by London Bridge, and the City companies fell in, but not before the Royal carriages had been stopped for nearly half an hour about the centre of the bridge by the dense masses of people. This was the first symptom of bad management which was visible along the whole route to Temple Bar. It had not apparently occurred to the authorities that the instinct of the people led them to see what was to be seen, and that if a road for the procession was to be kept, it must be done by the police. With immense difficulty the cavalcade worked its way to the Exchange, accompanied by boisterous cheering, but at that point it seemed doomed to stop short. The whole space in front of the Exchange and Mansion House was so packed with human beings that long before the arrival of the procession it seemed as if fatalities would occur. The shrieks of the women were every now and then heard above the uproar, and boys were struggling for life. At one time a baby was held up in the crowd, which had all the appearance of being dead or dying. A woman, to save the life of another child, threw it into a passing carriage, and was then swept away into the vortex of the crowd. How dense was the mass of people, and how eagerly every spot which offered a view of the proceedings was seized upon, may be imagined when we mention that the people were seated among the hoofs of the Wellington equestrian statue, and that others bestrode the horse itself before and behind the duke. Had not the crowd, and the few mounted police who were present, been pervaded by infinite good humour and perseverance, many lives must have been lost.

"In this emergency, says the *Times* reporter, "it would be unjust to leave unmentioned the signal service rendered by Lord Alfred Paget, who rode as equerry beside the Royal carriage. By an adroit mixture of firmness and good humour, and a skill in "chaffing" which charmed the multitude, he coaxed a passage where it was impossible to force it, and again and again rescued his charge from what might have proved a serious embarrassment."

In this way the procession crept along Cheapside till it came to St. Paul's church-yard. This was one of the most splendid scenes along the route. The Corporation had provided sittings for 12,000 spectators, at a cost of £9,000; sittings as handsomely fitted as the boxes of a London theatre; extending from the extreme north-east of the Churchyard to its south-west corner, at the top of Ludgate hill. This structure was covered with scarlet cloth, and was ornamented with orange blossoms and wreaths of colossal size, with medallions of the Prince and Princess, and with groups of flags, to the number of many hundreds, of every nation under the sun, but principally of English and Danish. Every house in the churchyard was alive with brilliant flags and streamers, every window with spectators, and even the coping-stones and chimney tops of the warehouses had their occupants.

"The appearance of the whole pageant, as the procession turned in from Cheapside and defiled round the Cathedral, was truly gorgeous and imposing. . . . But the scene that took place, when the personages of the day came in view, was one of the most extraordinary in the whole route of their Royal Highnesses. Every lady of the many thousands, seated round the glorious edifice that presented itself to the admiring eyes of the Princess, sprang to her feet, a myriad of handkerchiefs were waved simultaneously, the boys of St. Paul's gave "the fire," and the exuberant joy of the multitudes in the streets, in windows and on the roof tops, broke forth in deafening cheers that the roar of artillery would scarcely have drowned, and which were kept up till the Royal party had passed into Ludgate-hill. The young Princess first glanced at the wonderful dome of the stately pile before her, and then looking at the not less marvellous sight prepared for her own especial honour, her Royal Highness became visibly affected, and bowed her acknowledgements with much grace and feeling. Prince Christian (her father) stood up in the carriage, and removing his hat, saluted the people repeatedly; and the Princess Louise (her mother), to whom the Prince of Wales gave some explanations in reference to this magnificent demonstration, returned the warm greetings of the assembled ladies."

Down Ludgate-hill and up Fleet street to Temple-bar, the procession moved by inches at a time. At Chancery-lane the civic retinue turned off; and the honour of conducting the Princess from Temple-bar was delivered over to the Westminster authorities. What they failed to contribute to the procession in point of display they made up by speeding its progress, for from this point the coast was kept clear.

We cannot stop to enumerate the displays of loyalty and welcome which greeted the Princess through the Strand, Trafalgar-square, Pall Mall, St. James's street, and Piccadilly into the Park. Throughout it was a scene of flags, and banners, and cheering multitudes; the Princess winning all hearts by her modesty and beauty, and her graceful acknowledgement of her hearty reception.

In Hyde Park 17,000 Volunteers kept the road, and behind them on either side was the surging multitude. At five minutes past five the procession reached the Paddington Station, and in ten minutes afterwards the Royal train departed for Slough, where the decorations for the reception of the Princess had been entrusted to a committee of taste. The rain, however, had preceded the Royal party and compelled them to perform the rest of the journey in closed carriages. But the town was splendidly illuminated, and the streets were crowded with people who defied the elements, and cheered with all their throats and hearts. For an hour or more before dark the Queen, with the Princesses Louisa and Beatrice, was seen seated at a window immediately above the suite of rooms occupied by the Princess Alice, and did not retire till after dark. By-and-by the sound of distant guns and a volley of rockets announced the approach of the Princess, and at half-past six the the procession passed under the York and Lancaster gateway to the the grand entrance. In a few minutes afterwards the Princess was received into the arms of Her Majesty on the grand staircase; but little fatigued after the toil and excitement of the day, through

which she had borne herself with a grace which won the admiration of all beholders.

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3. THE ROYAL MARRIAGE.

The *Times* says, From an early hour the town of Windsor was astir. At 11½ precisely seven of the Royal carriages, with an escort of Horse Guards, left the Castle and proceeded in the direction of St. George's Chapel, At 11¾ o'clock expectation was further gratified by the issuing forth of another cortege, composed of members of the Royal Family and the Queen's Household.

It is needless to add that at sight of the Princess Alexandra, enthusiasm, which had been intense, was redoubled. Her Royal Highness had not the same flush of excitement on her features which was visible on the occasion of her public entry, but she looked, if possible, more charming and winsome than on that occasion, though exhibiting faint traces of agitation in her demeanour.

Simple, lofty and cold, it is difficult to light up the nave of St. George's. But the difficulty was overcome yesterday by the hues and colours so rich and bright that from the floor halfway up the fluted pillars the effect was like that produced by a piece of gorgeous tapestry, or by a grand oriental carpeting hung on the walls. The nave served as the channel and embankment of the stream which swept from the outer hall of the Chapel with all the pageantry of the great spectacle, and returning hence, rolled back its tide once more bearing the Prince and his bride on the swelling crest of all its pomp.

It would be in vain to attempt to describe all of incident which took place before the nave became the scene of most interesting proceedings, short as the time was. On a sudden—far remote indeed—are heard from the world beyond the walls, the dulled bars of "God Save the Queen," and as they are yet sounding nearer and nearer, the purple curtain is drawn back, and there enters the nave the procession of the royal guests. Next is that of the royal family and Queen's household ; third is that of the bridegroom and last of all, that of the bride.

His Royal Highness, whose mantle of the Garter concealed his uniform so far that only the gold-striped overall and spurs can be seen to give an indication that he wears his uniform below, bears himself as one who has a light heart and princely dignity.

It was 12½ o'clock when the drums and trumpets again sounded, and the curtain, rising for the fourth time, gave admission to the procession of the bride.

Up the centre of the chapel, is a rich carpet worked at the borders with the Prince's plume and motto with his own and his fair bride's monogram embossed between. Near the altar is a raised dais approached by three broad steps, and giving an ample platform for the accommodation of the bridal party and their royal relatives on either side. It is quite covered with garter blue velvet cloth, on which is worked the heraldic Tudorore, encircled by the motto of the Order of the Garter. On both sides, away from the space the bride and bridegroom will occupy, are crimson and golden seats with fringes and tassels of bullion for the members of the English and Dutch royal families. On the left of the altar the carved oak screen work has been removed, and is carefully piled away in the quaint old Chantry Chapel of the munificent builder of the whole structure, Sir Reginald Bray. In place of the screen are seats capable of accommodating some 30 guests of the diplomatic corps and their suites, only a few of whom can see well at all, so carefully divided and re-subdivided is every inch of space that commands any glance into the interior.

The altar was arrayed with gold communion plate in massive rows, the seats in the Knight's stalls and the spaces in front were covered with purple velvet, each seat bearing on a large card the name and rank of its occupant. Beyond these changes there was not much to note in the choir differing from its usual quiet, dim, religious aspect, as becomes the historic chapel of the eldest kingly seat of the oldest dynasty in Europe.

The distinguished visitors soon began to arrive in large numbers. All the ladies are in full court dress, with the exception that they wear no trains, and all, without exception, are dressed in velvet or satin either of blue, mauve, or violet color, the latter being the prevailing tone. All wear feathers and diamonds in their hair, and some show tiaras of brilliants large enough to form head-dresses, so completely do the glittering jewels cover the head like a legal crown.

All the gentlemen are in full official uniform, and wear the chief insignia of whatever orders they have the honor to possess, collars and badges in the fullest state. No bridal favors are worn on such an occasion of state dress, but, as a kind of *amende* for the necessary omission, where the collars of the orders of knighthood are displayed they are in every case looped at the shoulders with bows of white satin riband which answers the purpose equally well. Now that the choir is almost full, the predominance of mauve and violet colours is more marked than ever—in fact, few other tints are shown, except when ladies who fear the cold keep their white bournouses, which all without exception have, still wrapped about their shoulders.

It is a quarter to 12, and there is a short hush of expectation—one of those periods of unaccountable silence which always fall at intervals even upon the most crowded and animated assemblies. The Usher of the Black Rod, Sir Augustus Clifford, enters, and then there is another pause, that is quickly succeeded by a loud hum of admiration in the nave, which the more stately and select gathering in the choir only notice by increased rigidity of uprightness till the cause or the murmur is made known by the appearance at the entrance of the Knights of the Garter, all robed and jeweled in their almost regal costume, and headed by the Premier himself. They make a noble and gallant show as they sweep up the choir, like a procession of monarchs with their long velvet mantles of imperial blue, looped at the shoulders with white riband, trailing after them.

After all the knights are seated, the Lord Chancellor, in his robes, and carrying the Great Seal, passes slow and stately up the choir—alone, but a perfect pageant in himself—to his seat at the head of all. It is now 11¼ o'clock, and the Archbishop of London, attending as Dean of the Chapels Royal ; the Bishop of Oxford, as Chancellor of the Order of the Garter ; the Bishop of Winchester, as its Prelate, the Bishop of Chester, as Clerk of the Closet, and the Dean of Windsor, as Registrar of the Order of the Garter, with the Canons and Minor Canons of the Chapel.

Then there is a slight rustle of silks and clinking of jeweled orders as nearly the whole Corps Diplomatique come in and take their places underneath the royal pew—showing literally like a cluster of gold and jewels that equals even the appearance of the Knights of the Garter.

The Queen herself appears, accompanied by his Royal Highness the Duke of Saxe-Coburg and Gotha, the brother of the late Prince. The Queen wears the simplest and plainest of widow's cap, a black silk dress with white collar and cuffs, and black gloves. The only colors which appear upon her are the star of the Order of the Garter, and its blue riband. She looks well in health, but thinner and older with the permanent traces of deep grief and care stamped on every lineament of her features.

It is 12 o'clock, and the noise of cheering can be heard outside, and then a pause, broken after a few minutes by the grand rustle and peculiar hum which the great mass of visitors in the nave make on rising.

The first of the three processions is at hand but no one moves in the choir till the glittering file is seen, headed by herald and great officers of State, coming rank in rank in stately order, filing off to the right and left as they enter the choir, till they reach the dais, which none but the most illustrious may ascend.

Dhuleep Singh, with Prince Edward of Saxe Weimar, and the Prince of Leiningen, in his uniform, as captain in the English navy, he d the line of royal guests, but it is on the sister of the bride, the lovely Princess Degmar of Denmark, followed by her Royal mother leading in each hand the Princess Thyra and Prince Waldemar, that all looks are centred as with stately step they slowly pass up the centre. The Princess Christian is richly yet simply dressed, and only a feather and a few flowers are mixed with the thick clusters of her auburn hair. All as they reach the dais turn and make a deep and reverent obeisance to Her Majesty, and then pass on to the seats on the south of the altar.

Hardly are they placed in order when the cheers from without the building come loud and clear, with a sound that is almost noise amid that stately pomp and quiet, and the strains of the band playing the National Anthem can be distinctly heard heralding the progress of the procession of the royal family. There is the usual slight delay while it is marshalled in the temporary apartment, and then the trumpets burst forth as it enters the building.

Officers of the household, pursuivants and heralds lead the way as before, halting and making a double line below the dais, while the Princess Mary of Cambridge, her magnificent train borne by Lady Edith Somerset, moves up the choir with the same stately grace. At the dais her attendant pauses, and she turns to gather her train over her arm, and, moving to the centre, makes a profound courtesy to her Majesty, then passes at once to her place on the north of the altar, in front of and just beneath those treasures of iron-work, the gates of Quintin Matays. As she passes in the Duchess of Cambridge follows, with like state and ceremony, and then the Princess Beatrice, Princess Louise, and Princess Helena second in turn, followed by the Princes Arthur and Leopold, the latter in Highland dresses of the Royal tartan. All bow and courtesy deeply to the Queen, and the Princess Helena who wears a train, gathers hers on her arm like the rest, and seats herself near the Duchess of Cambridge. The next is the Princess Alice, wearing a noble coronet of brilliants, who pays the same deep reverence to her mother as all

the rest; then the Princess Royal, looking as young, as amiable, and as timid as when, with slow steps, she herself was led to the altar at the chapel Royal, but this time leading by the hand a fine little boy, who, all unawed by the stately pomp around, dragged on his mother's arm as he looked behind him at the pageant, and with difficulty brought his little feet to surmount the three steps of the *haut pas*. All have risen as they enter, and the Queen now rises too, and bows to her daughter with a kind and winning smile—the first that has passed across her face since she entered the chapel. Beethoven's noble march has been played as they filed in, but, as may be guessed, its strains, though beautifully rendered, are little attended to in such a scene as this.

Again the cheers come louder and more sustained than ever from the outside; again there is the same pause, broken by the trumpets and rattling kettle-drums in the nave, and this time all save the Queen herself rise and remain standing respectfully, for it is the bridegfoom that approaches. Great officers precede him, but they are little heeded; all eyes are turned upon the Prince of Wales, who, in his uniform of General, but wearing over all the insignia and purple mantle of a Knight of the Garter, comes slowly up the Choir, partly accompanied, partly followed by his brother-in-law, the Prince of Prussia, and his uncle, the Duke of Saxe Coburg, similarly robed. The wedding March is played as they move up with stately ease, and the Queen rises and the three ascend and turn in line toward her bowing deeply. The Duke of Saxe Coburg and the Prince of Prussia retire to the south side of the altar, and the bridegroom, after kneeling a few seconds in prayer, rises and stands "the rose and expectancy of this fair State," in the centre of the *haut pas* alone, with his face toward the Queen.

Such an occasion is one in which few men appear to advantage; yet the Prince gains by passing through it. With the easy grace that seems natural to his actions he stood alone, the watched and observed of all observers, neither bashful nor confident, but with a manly royal bearing that became his illustrious birth and exalted station. He looked round upon the splendid scene for a moment quietly and easily, and his every movement, his look, his very bearing, seemed in their vivid likeness to his royal father to amaze and impress all—even those who, by their rank and station, might be supposed to be the most familiar with his features.

With a great clangor of trumpets, which at first are muffled in a rich indistinctness behind the curtain, the long looked for procession of the bride enters, and the Prince, giving one look to satisfy himself of the fact of the arrival, keeps his eyes fixed upon the queen, and never turns his head again till his affianced stands beside him.

The hush was now so deep and breathless that even the restless glitter of the jewels that twinkled everywhere seemed almost to break it, in another minute the young bride had entered, and stood

> "In gloss of satin and glimmer of pearls,
> Queen, lily and rose in one,"

the fairest and almost the youngest of all her lovely train that bloomed in fair array behind her. Though not agitated, she appeared nervous, and the soft, delicate bloom of colour, which ordinarily imparts a look of joyous happiness to her expressive features, had all but disappeared, as, with head bent down, but glancing her eyes occasionally from side to side, she moved slowly up towards the altar.

On these occasions, we believe, the dress of the bride ranks in general estimation as one only second in importance to the celebration of the ceremony itself, which is to be regretted, for a lady's dress, like a lady's beauty, can only be described by its effect. It is embroidered with silk, trimmed with silver, which can just be discerned in rich designs glittering between the snowy folds. The traditional white is not, however, departed from, though over all she wears a slight boddice with open sleeves of white silk embroidered with silver, and which, falling tight, sets off her tapering waist and faultless symmetry of form to absolute perfection.

Slowly the bride reaches the *haut pas*, and as she stops to bow to the Queen, some of her fair attendants, who are apparently more nervous than herself, attempt to kneel, but, finding their mistake, rise quickly and move on as if they did not mean it. Then, and then alone, does the Prince turn, as if to receive her, but checks himself as he sees them all bowing to the Queen, and for the first and only time he seems irresolute as to what he ought to do. The long keen scrutiny seems to have disturbed his composure at last though only for a second, and while the Anthem ceases, and all retire a little apart while the bride and bridegroom are left standing in the middle of the *haut pas*, the former, of course, closely surrounded by her attendant bridesmaids.

Handel's march from 'Joseph' had been played at entering, but all music had ceased as the party stood around the altar, till its strains broke out with the solemn words of the chorale:

> "This day, with joyful heart and voice
> To heaven be raised a nation's prayer,
> Almighty Father, deign to grant
> Thy blessings to the wedded pair.
>
> So shall no clouds of sorrow dim
> The sunshine of their early days;
> But happiness in endless round
> Shall still encompass all their ways."

The exquisitely soft music of this chant, at once solemn and sorrowful, was composed by the late Prince Consort. It may have been this, or the associations and lifelong memories called up by the scene beneath her, but certain it is that as the hymn commenced her Majesty drew back from the window of the pew, and, after an effort to conceal her emotion, gave way to her tears and almost sobbed, nor did she throughout the rest of the ceremony entirely recover her composure.

The bridal party saw nothing of this; the bride's face was turned from the pew, and the Queen was withdrawn too much from the front for the Prince to see her, though his looks were often turned in that direction. As the solemn chant ended the Prelates advanced to the communion rails, and the Primate, in a rich, clear voice, which was heard throughout every part of the building, choir or nave, commenced the service with the usual formulary, 'Dearly beloved, we are gathered here in the sight of God and in the face of this congregation to join this man and this woman in holy matrimony.' There is a solemn pause after that dreadful adjuration, in which they are charged to answer if there was any impediment to their marriage, and then after a moment the Primate passed on to "Wilt thou, Albert Edward, have this woman to thy wedded wife, to live together after God's ordinance in the holy estate of matrimony? Wilt thou love her, comfort her, honour and keep her in sickness and in health; and, forsaking all other, keep ye only unto her, so long as ye both shall live?"

To this the Prince rather bowed than responded, his utterance was indistinct. To the same question, "Wilt thou, Alexandra Caroline Maria, have this man to thy wedded husband?" the reply was just audible, but nothing more, though, as usual, every ear was strained to catch it.

But to the words, "I take thee, Alexandra, to my wedded wife, to have and to hold from this day forward, for better for worse, for richer for poorer, in sickness and in health, to love and to cherish, till death do us part according to God's ordinance; and thereto I plight thee my troth," the Prince repeated clearly word for word after his Grace, though now again, when it was the turn of the young bride, she could be heard to answer almost inaudibly, and her cheeks were suffused with a crimson flush, and she seemed very nervous.

To the question, "Who giveth this woman to be married to this man?" the royal father of the bride only bowed and moved towards the Princess, who was removing her glove hurriedly. Then the Primate joined their hands, and in a clear, soft voice firmly and deliberately repeated the words:

"With this ring I thee wed, with my body I thee worship, and with all my worldly goods I thee endow; in the name of the Father, of the Son and of the Holy Ghost. Amen.

All then knelt down while the prayer commencing 'O Eternal God, Creator and Preserver of all mankind, Giver of all spiritual grace, the Author of everlasting life; send Thy blessing upon these Thy servants, this man and this woman, whom we bless in Thy name," was solemnly repeated, and then they rose, while the Primate joined their hands and said the final words, "Those whom God hath joined together let no man put asunder."

With these words, which in law completed the marriage ceremony, the service was continued to the 67th Psalm, the solemn strains of which came like a relief to what seemed almost the overwrought feelings of all within the choir as the words went pealing softly through both nave and aisle.

Then was continued the usual prayer and exhortation, during which the guns in the Long Walk were heard booming forth, and the steeples throughout the town seemed to fill the air with sound. Misled for a moment the Queen's band began tuning their instruments, and even the organ gave one or two spirts and whistles, as if anxious to lead in the race of harmony. It was premature, however, and there was a gentle hush, which restored the former silence, when the Primate was heard concluding the exhortation. Then, raising his voice, he solemnly pronounced the benediction, during which the Queen, who had been more deeply affected, knelt and buried her face in her handkerchief. The bride and bridegroom then joined hands, and turning to the Queen gave more a nod of kindly friendship than a bow of State, which the Queen returned in kind. In another minute, the Queen, giving a similar greeting to the Princess, quitted the closet, and the whole pageant went pouring forth in a gorgeous stream or flood of colours, waving plumes and flaming jewels, out of the choir. None can tell but those who were present, how grand and solemn was the whole ceremony, or with how much of hope and true devotion the marriage of the second Prince of Wales was celebrated in St. George's Chapel, Windsor. As they left, the choir and the band went pealing the Hallelujah of Beethoven:

"Hallelujah to the Father
And the Son of God;
Praise the Lord, ye everlasting choir, in holy songs of joy.
Worlds unborn shall sing His glory,
The exalted Son of God."

4. HER MAJESTY AND HER BALMORAL DEPENDENTS.

Of all the admirable traits in Her Majesty's personal character, none is more endearing than the interest she takes in her dependents, and her anxiety to promote their happiness. A very touching instance of this has just come to our notice. We do not need to say —and could not if we did—what fabulous sums would be given by the proud millionaires of England for a place in St. George's Chapel at the great ceremony on Tuesday. But the pleasure and honour for which these men must wish for in vain will be enjoyed by the humblest on the highland estate of Balmoral. Her Majesty has graciously invited the whole of her dependents there to be present at the marriage of her son, and ordered arrangements to be made for the conveyance to and from Windsor of as many persons as can possibly be spared from their duties upon the estate. They in their turn have evinced their affection for their royal mistress by many simple but pleasing expedients—such, for instance, as sending to many distant places chaplets and crowns of heather cut from the Prince's own forest at Braemar.—*Edinburyh Daily Review.*

5. THE ENGLISH BOYS OF BONN.

On the Royal Marriage day ten young English boys, at a school in Bonn, sent the following congratulatory wish to Windsor Castle, by telegraph:

"Ten loyal English boys in Bonn
Can ne'er restrain their heart's desire,
To send their future king and queen
Their wishes with their hearts therein
That beat for them till they expire."

The following answer was transmitted by the same means; "The boys at 20, Webberstrasse, Bonn. The Prince and Princess of Wales thank you for your kind message and wishes, and ask for a holiday for you.—Sir Charles Phipps, Windsor Castle."

6. MARRIAGE OF THE PRINCE OF WALES.

The following is from the New York *World* of the 10th. The tone of the article is certainly all that could be expected at the present time:—"This day is marked with a white stone in the flying calendar of Time for all the dwellers in the British isles. It is a high holiday from the Land's End to John O'Groat's. And in Macaulay's magnificent word-picture of England's rising when the great Armada came; from hill-top to hill-top, from city to city, from castle to cottage, the thrill of a common national impulse will run to-day, but not as then in the beacon-fires of wrath and war. The island Queen will don to-day no martial harness, but the saffron robes of hymeneal joy. She will deck herself in white favors. She will wreathe her brows with the clustering blossoms of the Orange. From the towers of all her venerable ministers, from the spires of her innumerable churches will ring out to-day no tocsin of battle, but through all the land, from shire to shire, over crowded city roofs, and pleasant fields, and stately parks, 'will come a sound of marriage bells.' "The heir of the British crown takes to himself this day a partner of his life, a consort of his future throne, and all the people with one voice unite to bless the bans. In the midst of our own great national trials we may not find much sympathy to spare for this festival of our cousins across the sea; and we have not been trained to habits of thought which can make us readily comprehend the sort of personal interest which thirty millions of people are this day manifesting in so simple an event as the marriage of two young persons in nowise distinguished by their individual qualities from ten thousand of other couples who may seize the same auspicious occasion of uniting their hearts, their fortunes, and their hands. And yet it would be ungracious in us not to recognize the heartiness, and in certain aspects the reasonableness, of a feeling which we cannot partake. The event which Great Britain so celebrates to-day is something more serious than a pleasant pageant. For weal or woe the destinies of the great English nation, and in a measure of the civilized world with which by so many and so steadily increasing ties that nation is bound up, must be gravely affected by the ceremony which this day makes the Prince of Wales the first husband of the realm. Whether the youth whom three short years ago we welcomed to our shores with a hospitality unexampled in the history of states is to begin to-day a life of domestic happiness and honor and dignity which shall make him fit to bear the tremendous responsibilities of the high station to which he is destined, or whether he is to repeat the sad story of too many of his ancestors, is a matter of no slight political importance to the world at large as well as to his own kingdom. And the cordial sympathy with which the English people greet him at the threshold of his new career imposes upon him an obligation that can be measured only by the greatness of the opportunity which it opens to his imagination. It is a tribute to the virtue of his living mother, a spontaneous and impressive homage paid to the excellence of his dead father, and well will it be for England and for himself if he can adequately appreciate the evidence it affords of all that England expects of the son of Prince Albert and the destined successor of Victoria. A King of modern England must wear his crown wisely if he is to wear it honorably or indeed at all. The days of blind and unquestioning loyalty are passing away all the world over; and the confidence which crowns the nuptial altar for Albert Edward to-day, not only with the splendid appanages appropriate to his rank, but with the more magnificent bridal gift of a great people's exuberant good will, is the fruit of a reign adorned with virtues which would have made the humblest private station honorable. That the Prince thus nobly dowered may prove himself worthy of this, his best inheritance, is a prayer in which the sturdiest republican of us all will not to-day refuse to join with the jubilant millions of his future subjects."

7. THE PRINCESS OF WALES & THE ROYAL FAMILY.

The Paris correspondent of the Montreal *Herald* gives the following sketch of the Princess of Wales and her relations with the Royal Family of England:—"It would certainly be difficult to imagine happier auspices than those under which will take place the wedding of the young couple on whom all England is now preparing to shower the tokens of its affectionate good will and good wishes; and happily for the future of the empire 'on which the sun never sets,' the slight shadow which at one moment seemed to threaten the reputation of the youthful bridegroom, appears to have been dissipated by the general conviction that there has been 'much cry' over 'very little wool,' and that rumor had grossly exaggerated the facts of his misdemeanors, whatever they may have been. It is satisfactory to be able to say that every bit of gossip that reaches us concerning the Prince of Wales, concurs in respecting him as a most amiable kind-hearted, well intentioned youth. A want of firmness, to a certain extent, seems also to be proved in relation to His Royal Highness; the result of the remarkable gentleness and sweetness of his disposition and his distinctive reluctance to say or do anything in opposition to those who have most influence with him. The Princess Alexandra, though by all accounts, a most charming, accomplished and amiable girl, is considered to possess a very sufficient amount of firmness and will; and there seems to be reason to hope that she will be fully able to complete, in this particular, the moral 'stock in trade' of the new firm. In person, as I learn from an informant who has frequently been in her company, the Princess Alexandra is rather, but not much above midle height, with a very bright, clear complexion, fair, with good color, brown eyes, beautiful brown hair, and a very graceful figure. The expression of her countenance which is full of vivacity, betokens intelligence and kindness. In temper she seems very happily gifted, being at once gay, energetic, lively, and affectionate. That she should, though without any haughtiness, be fully aware of the greatness of the dignity upon which she is soon to enter and should appreciate, at its value, the position to which she is raised by the spontaneous preference of the Heir of the British Crown, is both extremely natural, and what few of her husband's future lieges will be disposed to blame. The instant affection with which she inspired the Queen, on her first presentation to Her Majesty, during the Royal sojourn of last summer in Germany, is not one of the least pleasing points of the approaching alliance. Those who are about the Queen say that Her Majesty's affection has never before been so suddenly and warmly called out by any one; and this diversion of the Queen's thoughts and affections into a new channel, and one in every way worthy of her love and confidence, will doubtless be attended with the happiest effects on the spirit and health of the Royal widow, filling as far as such a void can be filled, the place left empty by the loss of her husband. All the members of the Royal Family 'took to' their new friend with the same prompt liking; and the young Princess, on her side, seems to have conceived for them all the same affection with which she inspired them. On the Rhine, and at Windsor and Osborne, she seemed at once to fall into her place as one of the Queen's children, walking and driving with the Queen, and, if report speaks true, enjoying a game of romps, or a scamper through the grounds with the younger children, as heartily as they. The name which all the Royal Family adopted as her pet appellation among themselves, is 'Alex,' and she has been installed by general consent as the favorite of them all. The affection of the younger members of the Royal Family for their new sister, seems on one occasion, to have been the cause of a temporary heart-break to one of them. It appears that the Princess's birthday occurred a few days after the conclusion of her last visit to the Queen; and the little Princess Beatrice, on that day, got herself into sad trouble, by resolutely declining to learn her lessons, on the plea that it was 'Alex's birthday,

and so they ought all to have a holiday and a cake.' The plea being put aside by her Majesty, and the double demand for a holiday and a cake being met by a refusal of both, the wilful little lady declared with an indignant sense of injury, and torrents of angry tears, that nothing should make her learn any lessons that day, and so resolutely did she stick to her determination that she preferred being sent to bed for the rest of the day, to learning any scrap of a lesson on 'Alex's birthday.' The Royal children being all blessed with active dispositions, and brought up in the habits of constant activity, being sent to bed in the day-time appears to be the punishment of which they stand most in awe. But even this dire infliction was powerless to compel poor little Beatrice to consent 'to be good,' and to do her lessons on so very special a day as 'Alex's birthday.'"

8. THE PRINCE OF WALES IN THE HOUSE OF LORDS.

The following account of the ceremonies attendant upon the Prince of Wales taking his seat in the House of Lords for the first time, is taken from the *Times* of the 7th inst:

At a few minutes after four o'clock the procession entered. The coronet of his royal highness was preceded by Sir Augustus Clifford, Usher of the Black Rod, and by Sir Charles Young, in the glittering robes of Garter King-at-Arms. Lord Edward Howard, deputy earl marshal, was also present. His royal highness wore the scarlet robe, with ermine bars proper to his rank as duke, over the uniform of a general in the army. He also wore the George and the Star of the order of India. Taking part in the procession, and attired in their robes as peers, were the Duke of Cambridge, the Duke of Newcastle, the Duke of Argyle, Earl Grenville, Earl Spenser, Earl St. Germans, Lord Kingsdown, Lord Willoughby D'Eresby, Hereditary Lord Great Chamberlain, and Viscount Sidney. As the escort entered the House the Peers rose *en masse*. His royal highness bowing his acknowledgments, advanced to the woolsack and placed his writ of summons in the hands of the Lord Chancellor.—Then proceeding to the table, the oaths were administered to him by Sir Shaw Lefevre, Clerk of the Parliament, and his royal highness signed the roll of peers. The procession then moved toward the throne, and the Duke of Cambridge, pointing to the chair of state on the right of the throne, bearing the well known Prince's plume and motto, his royal highness took his seat there covered.—Rising immediately afterwards, he again advanced to the woolsack and shook hands cordially with the Lord Chancellor, who offered his congratulations, and his royal highness then retired by the peer's entrance. The oaths were afterwards administered to the Archbishops of Canterbury and York, who were introduced by the Bishop of London. The sitting was then again suspended. At five o'clock when the House resumed, the galleries were filled with ladies, and the attendance of peers was very numerous. Shortly before business began the Prince of Wales, accompanied by the Duke of Cambridge, entered, and took his seat on the cross-benches.

V. Educational Intelligence.

—— MECHANICS' INSTITUTE CLASSES.—The soiree closing the winter sessions of the Mechanics' Institute classes, came off last night in the Music Hall and was attended by a large and respectable audience. The Chairman, after explaining the way in which the entertainment originated, called upon Mr. Carnegie, the chairman of the classes committee, to read the report, which stated that arrangements had been made for permanently establishing the classes during each winter season, and the great success which had attended them during the past winter. The Mayor then presented the prizes to the most proficient students. The books presented were richly bound and some of them were by the best authors. The sum of $116 were expended in providing those books, $100 of which was given by the Northern Railway Company. The various students, as they carried away their prizes were loudly cheered by the audience, a compliment which must have proved highly flattering to them, and which must have proved, in addition to the book prizes, some reward for their perseverance in the different studies in which they so successfully engaged. The Mayor after paying a high compliment to Mr. Wm. Marling, who obtained a diploma, a large number of books and an apprenticeship admitting him to the machine shop of the Northern railway for his great proficiency in the different branches, said as his pleasing task was over he desired to congratulate the President of the Institute, as well as the gentlemen connected with him for the success which had attended their efforts in promoting education in the city. He refered in a few and well chosen practical remarks to the advantages derived from a sound English education. The necessity for young men studying book-keeping was, he thought, very great. Every one engaging in mercantile pursuits should not be ignorant of it. A knowledge of mathematics, he was of opinion, was of paramount importance, and although there was a danger of young men engaging in the study of it ever diverting their minds from that to any other study, yet the knowledge of it was so necessary to a mechanic that he ought never to be ignorant of it. The Rev. Dr McCaul followed in a speech of much practical interest and ornate, as are all the Doctor's speeches. After speaking in a congratulatory manner of the large amount of money expended on education in Canada, he then referred to an unfortunate class of children, which he called the "Arabs of our streets," and for whom no law had as yet been made to meet their case. The subject has often been referred to but no remedy had yet been found. If, said he, it be the case that those poor children were prevented from attending school for want of proper clothing, then in God's name let ragged schools be established. If it be the case that their parents are careless about their education, then in God's name let there be a compulsory law. The reverend gentleman after a few further remarks, resumed his seat amid loud applause. Mr. F. W. Cumberland, the Managing Director of the Northern railroad, followed in a few remarks on the subject which brought them together. The Directors of the Mechanics' Institute then ascended the platform to receive an address from the pupils attending the classes. It was read by Mr. Lillie, and was couched in grateful language for the benefits bestowed on them by the Directors in the institution of the classes.—*Leader.*

ERRATA.

In the January Number of the *Journal of Education*, the following misprints occur in the "Circular from the Local Superintendent," &c., page 21:

1st paragraph, line 4, for *the* read *that*.
3rd paragraph, line 8, for *continuing* read *counting*.
11th paragraph, line 1, for *come to*, read *to come*.
Last paragraph, line 2, for *taste* read *tase*.

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