

Recd - Sept 29th
Ans Oct 6th

New York September 25th 1854

Dr George Engelmann.

Dear Sir,

I am in receipt of your favor of 17th inst. and thank you for the suggestions and met. observations which it contains.

In regard to the "important atmospheric changes which appear like huge waves progressing from west to east" and which may often be traced from ^{near} the Rocky mountains to the coast, ^{and that they are identical with the northers of Mexico} the results of your inquiries agree with mine. I am led to believe however, that that these changes are as truly cyclonic, in their essential character, as those of the Atlantic storms, which often visit this region.

In New York we are made subject to both classes of these phenomena, if indeed they be different in their essential elements. But the laws which ^{severally} govern these phenomena do not appear to me as different, and capable of division. You will perceive from my last paper, a pamphlet copy of which I now send you, that the apparently wave-like progress from west to east in these latitudes, may be traced entirely across the Atlantic in the principal case which is there presented: - a greater distance than from the Rocky mountains to Boston. And yet, the core or nucleus of this huge cyclone travelled undoubtedly on a course which is diagonal to this apparently eastern progression.



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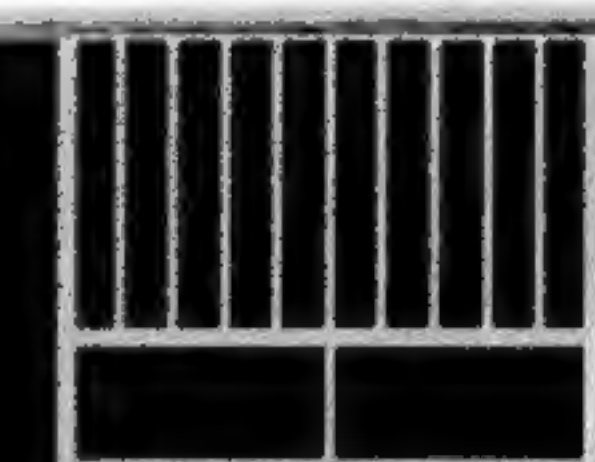
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It appears however that the lower winds of the great cyclones which sweep over the interior of the continent are less regular or symmetrical and the winds of inversion on the left of its axis path less noticeable than on the ocean: owing to the obvious conditions of the case, and mostly to the fact that continental examinations are mostly confined to the right side of the cyclonic path.

The observations you send me, which are more thorough than my own, are of great interest, as they enable me to trace more satisfactorily the progress and character of the double cyclone or rather the two simultaneous cyclones by which the great change from the heat ^{and dryness} of summer to the temperature of autumn was induced. The most western of these cyclones, which set in with you on the 7th and ^{showed} its nearest approximation of center ^{early} on the morning of 9th and without rain, first reached us on the 8th and its center approximated late in the afternoon of 9th the winds on that day three points more southerly than with you on the 8th showing that our position was ^{even} more to the right of its axis path than yours. Its near bar. max. was with you on morning of 10th but with us was indeterminate, from a cause which follows. The sky was partially clouded ^{blue} on the 9th with no rain, and ^{with} a scorching sensation of heat, from the great plains of the southwest.



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On the night of ninth the left margin of the coast storm or great hurricane of the Atlantic (probably not inferior to that of Sept. last year) interposed beneath the overland cyclone, bringing with it a portion of the temperature and ice-like chill of the great boreal current which washes our eastern shores. This sudden transition from the warm right limb of one vast cyclone to the chilly left limb of another which was even more fresh from the tropical latitudes, was one of the most marked and decided changes from summer heat and dryness to autumnal temperature and rains, which I have ever noticed.

The cyclone of 5th Jan. ^{the center of} last, which approximated to you on that day with its western margin ^{then} at Ft. Ber-
arrie, was with us ^{late} on the night of 6th. (bar. unmarked) and its rear side on the 7th bar. 30.45 therm. 17°, cloudy & fog, but no rain or snow. On the Brazos, Texas, (lat 30.30 lon 96) a strong Norther, ^{at this period,} the cold setting in at 10.30 a.m. of 5th.

Your nearest central approximation ^{in cyclone} of Jan. 15th reached us on the 16th. with ^{some} rain & snow. Its receding margin on morning of 18th ^{with} therm. 31° Bar. 30.36 at sunrise.

Your central approximation of Jan. 20th. reached us about midday of 21st bar. 29.60 therm. 49°. The receding margin of this cyclone left us on the ~~evening~~ ^{afternoon} of 22nd, bar. at 6 p.m. 30.55 ^{therm. 22°}.

On the night of 22nd and during 23rd the right limb of another cyclone passed over us, and on the morning of 24th the therm. sunk to 10°. ^{the barom. that morn. 30.48} It was 14 at sunrise of 22nd and 19th of 23rd.



I enclose herewith a copy of my journal of
6th to 11th of the present month. It is roughly kept,
but will suffice for comparing our phenomena
with yours. If I had opportunity for effective
labor in this department I would be glad to
accept your kind offer of further materials. As
it is I shall feel obliged for your present kindness,
and still further if you can furnish me with
your observations from 5th to 9th of June last, at
which period I was on the upper Mississippi
during the transit of a cyclone of decided strength
and character, which reached this region on
the day following. Any notices of this from
points west of St. Louis will also be gratefully received.

I have lying on hand some unfinished labor
on the storm which occurred between Oct 11th and 14th 1846,
regarding which your observations ^{at St. Louis} would be of interest.

yours truly

Wm. C. Cress

Wm
Wm



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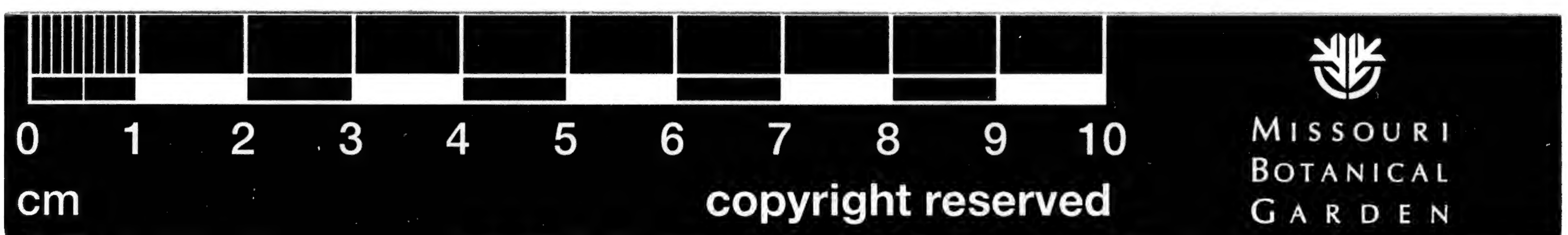
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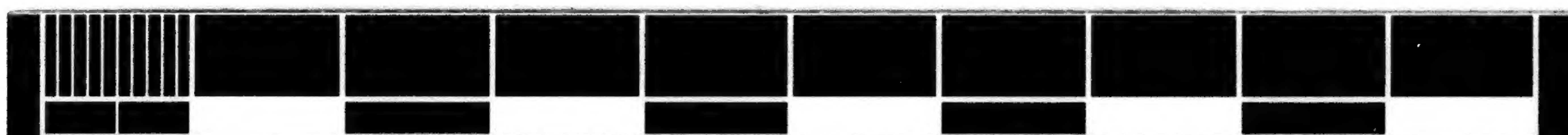
Sept.	Mo.	Th.	alt. th.	Barom.	Winds	Strength	Clouds from	Remarks
Wed.	6	6	78		SW	Moderate	SW cum. str. W.S.W. cum. str.	5
	10	79	78	30.16	"	"		5
	2				"	"		
	6	88		.04	"	"		3
	10	81	79	.06	"	"		
Thurs.	7	6	76	78	.08	SW	SW cum. str. S to SW cum.	2
	10	78	79	11	W.S.W. - SW	"	"	3
	2		80		SW	"		6-
	6	85	80	09	SWW	light		
	10	76	78	19	"	"		0
Frid	8	6	69	76	22	"	W.S.W. cum. str.	0
	10	73	76	23	" - SW	"	"	1
	2				S - SSE	mod.	"	3
	6	78	78	12	"	"	"	5
	10	76	77	07	"	fresh	W by S cum. str. S.S.W. (swift cum.)	5
Sat.	9	6	79	78	29.96	SW by W	W by S. cum. str. 6-10 SW by W (swift cum.) S.W. (str. cum.)	4
	10	82	79	95	"	Strong	"	1 to 5
	2		80	88	"	" - mod.	W.S.W.	6-10
	6	84	79	87	"	"	"	10
	10	81			N.E.	Strong gale in night - W.		10
Sun.	10	6	63	77	94	"	E.N.E. cum. str.	10
	10	64	75	95	"	"	"	10
	2	59	74	88	" - N.W.E.	Strong	W.S.W. cum. str. (storm cum.)	10
	6	58	73	92	N.W.E. to N	"	W.	10
	10	57	72	30.02		Mod.	"	10 (Cloud in night)
Mon	11	6	52	71	16	N.W.E.	S cum. str.	3
	10	60	71	22	variable	"	W. cum. str. 4-8	4-8

A strong & dry cyclone commenced to night. At 10 p.m. a thin & low storm cloud flying from SSW at the estimated rate of 60 or 70 miles per hour: over this is a "mackerelled" stratum of loose cirro cumulus moving moderately from N.W. by S. estimated 3000 or 3500 ft from the earth. From 10 p.m. to 6 a.m. heat increased one degree in my sleeping room with open windows & doors. This will not be ascribed to solar influence. Sept. 10. A cold N.E. rain-storm and gale set in during last night, which apparently is a new and distinct cyclone from that of yesterday.

By W. C. Redfield N.Y. city.



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Rec: March 10
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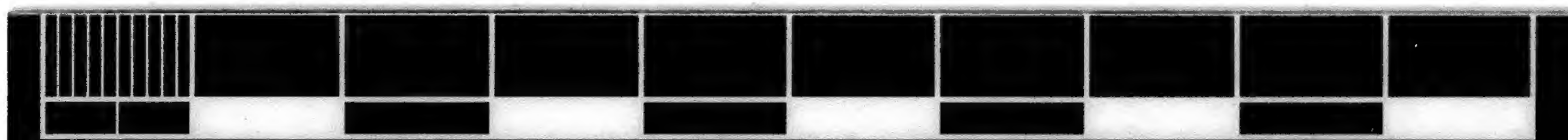
New York ~~February 5~~ March 1855

My dear Sir,

I thank you for your kind letter of Feb. 22, and for the met. records which it contains; and greatly wish that you would pursue the inquiry in relation to the two cases thus presented. I regret to say that I even omitted to preserve the extensive telegraphic comparisons which were printed in the "Tribune" & "Times" of this city, (for the most part) and until they were unfortunately destroyed.

I send you my imperfectly kept records for the same periods; and will here notice that the bar. max. which immediately preceded the first cyclonic period occurred at New York on the morning of Jan. 17th. This overland cyclone appears well worthy of further investigation. The report from San Antonio is interesting and I suppose must refer to the post minimum bar. period of the cyclone. The time, if correctly reported as the beginning of the "norther," would seem to be later, in proportion to St Louis, than is common.

Our severe cold of Feb 6-7 was probably connected with the cold ending of one cyclone & the beginning of another, progressing in the track of our coast storms which do not reach the western states. But the immediate source & ^{the local} progression of the cold, ^{in this particular case} is doubtless found in the N.W. & N.E. winds (principally the former) which brought the subtile cold air to us direct from



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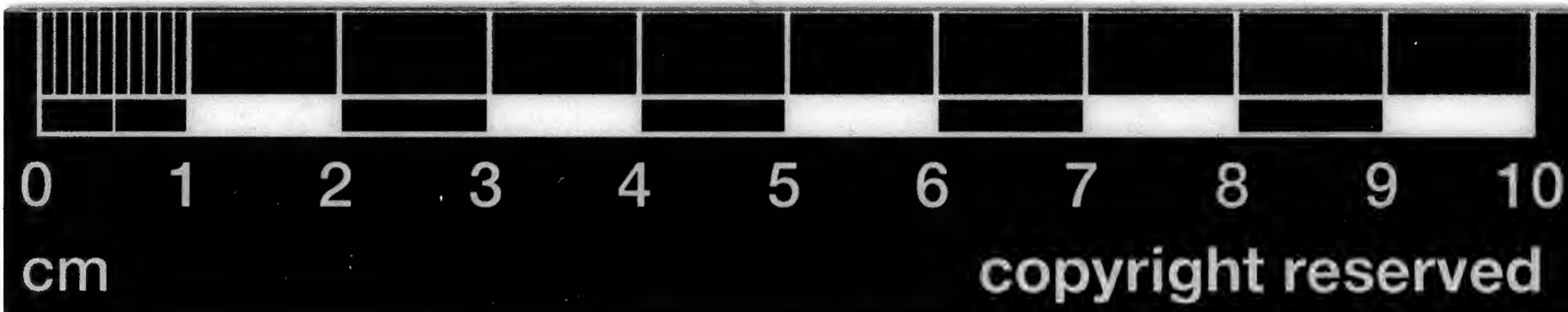


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Canada and the basin of the St. Lawrence.

This seemingly natural progression of the cold appears rather to be the exception than the rule, in ~~the~~ severe winter weather of New England, and occurs in marked distinctness two or three times in a winter; but more often the regular cyclonic progression of reduced temperature is decidedly from the westward & southwestward; some times passing into the Atlantic without fairly getting so far north as Boston.

The cyclones which pass over Arkansas & Missouri must probably have Mexican rather than Californian relations, and I am glad that you so fully recognize the distinctions and obstructions pertaining to aerial currents or horizontal movements, necessarily of but limited vertical dimensions or thickness. But as the cyclones which are found on the West coast of N. America, north of lat. 25° , ^{strike} ~~fall~~ perpendicularly to the line of coast, I see not how they can avoid affecting the temperatures & changes which occur east of the Coast Range and of the Sierra Nevada and even of the Rocky Mountains. Indeed it is probable that ~~the~~ most common overland cyclones, in the far west, enter the basin of the Colorado by the Californian gulf and thus, ^{mainly, or probably,} avoid the obstruction afforded by the two ranges first mentioned. The hygrometric



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conditions and visible phenomena of any cyclone
passing from the Pacific Ocean over the interior
of the Am. continent would doubtless be ~~greatly~~^{greatly}
modified; and their features, ^{in the interior of the continent,} would hardly be recog-
nized by our nautical friends.

Wishing you health and zeal for an
extensive prosecution of these important
inquiries I am dear sir

truly yours

Wm. C. Redfield

Dr George Engelmann.



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1855	Mo	Ther ^{at}	Ther ^{at}	Barom	Winds	Strength	Cloud, form	Cloudiness 0 to 10	Remarks	
January										
Wednes.	17	6	29	56	30.25	E NE	Moderate	WNW	10	
+		10			25	max. E by N	"	"	10	
		2			21	E NE	"	"	10	
		6				"	"	"	10	
		10	35	67	13	"	"	"	10	
		10	35	65	09	"	"	"	10	
Thurs	18	6	38	58	29.87	SW	light	SW	10	Misty
		10				WSW	"	cu. st.	9	
		2				" - SW	Mod.	" "	2	
		6	38	65	76	"	"	"	2	
		10	34	63	77	"	"	"	0	
Frid.	19	6				"	"	SWW	0.	
		10	32	63	68	SWW	Fresh. Strong	"	3	
		2				"	Strong	"	6	
		6	32	65	73	"	"	"	2	
		10	30	65	76	"	fresh - Mod.	"	0	
Sat	20	6	25	57	80	W by S.	Mod	WSW	2	
		10	29	64	83	WSW	fresh	WSW	10	
		2		63	86	SW	"	"	9	
		6	32	63	85	"	"	"	10-	
		10	30	64	93	"	"	"	0	
Sun.	21	6	31	50	30.00	NE	Mod.		10	
		10		62	03	"	"		10	Rainy
		2				"	fresh		10	"
		6	34	62	29	86	"		10	Rain
		10	36	66	74	- SE or SSE	Gale		10	"
Mon.	22	6	52	57	33	min. S. - SW	Strong	S	10	
		10	48	65	40	SW	"	S. cu. st. SW. cu.	8-5	
		2				WSW	"	WSW cu	7	
		6	29	64	88	W	"		2	
		10	27	68	30.00	"	"		4	
Tues	23	6	20	55	16	"	fresh		0	
		10	22	60	27	"	strong	WSW	-1	
		2				"	"		0	
		6	24		26	"	fresh		0	
+		10	23	62	29	max.	"		0	

Jan 26th a cyclone with wind from ENE to E during its access & bar falling to 29.22 at 4 pm, when while a fearful gale N by N is reported on the Illinois prairies.



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	Hour	Therm	at the Bar	Bar	Wind	Strength	Clouds	Clouds	Remarks
Feb. 4	6	10	48	29.97	West	fresh		0-3	
	10	14	57	30.00	"	"		5	
	2				"	"		6	
	6	17	60	29.94	"	"		7	
	10	18	61	90		Mod.		10	Snow
mond 5	6	18 1/2	49	65	NNE	"		10	"
	10	20	58	70	NWN	fresh		10-4	
	2				NW	"		0	
	6	20			"	"		0	
	10	13	59	82	"	"		0	
Tues. 6	6	3	44	98	NWN	"		0	
	10	6		30(?)	"	"		0	
	2				"	"		1	
	6	0	54	30.18	"	"		0	
	10	4-6	54	24	"	"		0	
Wednes 7	6-6	38	30		NE	Mod-fresh	NWN at 9-10		
	10-2	50	35		"	Strong		10	
	2+8	50	20		"	Gale		10	
	6	9	52	11	"	"		10	
	10	13	52	00	"	Strong		10	
Thurs 8	6	18	44	29.80	"	"		10	Snow
	10			76	"	"		10	"
	2	24	56		"	"		10	"
	6	26			"	fresh		10	
	10	25	50	70		"		10	
Frid 9	6	22				Mod		10	
	10		55	80		"		10	
	2					"		10	
	6	27	55	86		"		10	
	10	23	53	30.00		"		10	
Sat 10	6	15	48	12		"		10	
	10	18	57	22		light		0	
	2		59	19		"		0	
	6	22	58	21		"		0	
	10	17	57	24		"		0	

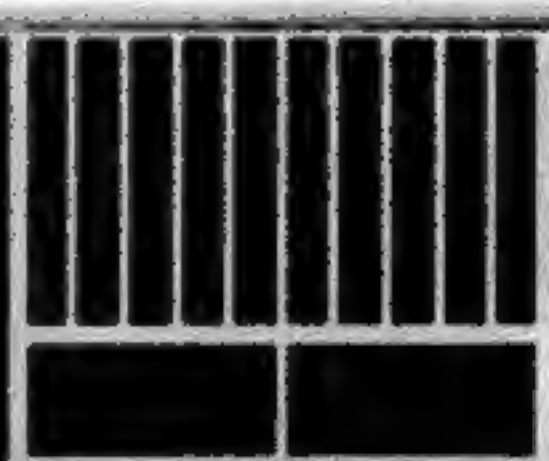


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