

TIDE, HOURS, RANGE, AND COMPASS VARIATION.

PLACE.	H. W. F. & C.		RANGE.		VARIATION.	
	H.	M.	FEET.	EAST.	°	'
NORTH ISLAND.						
Three Kings Island	8	0	7	0	14	55
Bay of Islands	7	15	4 to 9	14	20	20
Waikare Harbour	7	0	5 to 9	14	20	18
Auckland Harbour	7	10	7 to 11	14	18	47
Tauranga Harbour	9	16	6	14	47	
Cape Runaway	8	55	7	14	49	
East Cape	5	5	5 to 6	16	0	0
Poverty Bay	7	50	2½ to 5	15	0	52
Ahuriri Harbour	4	30	6	14	45	
Port Nicholson	9	0	4 to 8	14		
Kapiti Island	10	0	4 to 8	14		
Manawatu River	10	15	4 to 8	14		
Wanganni River	9	30	6 to 14	14		
Taranaki	9	30	12	13		
Kawhia Harbour	10	0	7 to 11	14		
Manukau Harbour	10	55	8 to 11	14		
Kaipara Harbour	9	45	10	14		
Hokianga Harbour	9	45	10	14		
MIDDLE ISLAND.						
Cape Campbell	6	0	6 to 8	14	53	
Kaikora Peninsula	5	30	6 to 8	15	24	
Lyttelton	4	20	4 to 8	15	40	
Akaroa	3	24	4 to 8	16	1	
Otago Harbour	3	8	4 to 8	16	31	
Molyneux River	1	10	4 to 8	15	9	
Ruapeku Island	1	20	4 to 8	16	10	
Bluff Harbour	11	0	4 to 8	14	5	
Preservation Inlet	9	20	6 to 14	13	54	
Cape Foveaux	0	50	6 to 8	16	6	
Motupipi River	9	50	6 to 8	16	8	
Nelson Haven	9	55	6 to 8	14	0	
Port Hardy	10	0	3 to 11	16	10	
Porus Sound	9	0	6 to 8	14	5	
Port Gore	8	50	6 to 8	13	54	
Queen Charlotte Sound	6	10	6 to 8	16	6	
Tory Channel	12	45	4 to 8	16	6	
Port Underwood	12	0	7	18	0	
SOUTH ISLAND.						
Port William	12	45	4 to 8	16	6	
South Cape	12	0	7	18	0	
Traps Rocks	12	0				

HIGH WATER.

From which to find approximately the times of High Water in the Harbours of Nelson, Lyttelton and Port Chalmers, from the Age of the Moon.

Calculated for the afternoon of each day.

MOON'S AGE.	NELSON.*		LYTTELTON.		PORT CHALMERS.	
	Days.	H. M.	H. M.	H. M.	H. M.	H. M.
0	9	50	4	20	3	30
1	10	27	4	57	4	7
2	11	4	5	34	4	44
3	11	39	6	5	5	15
4	—	—	6	36	5	46
5	0	38	7	8	6	18
6	1	20	7	50	7	0
7	3	13	8	40	7	50
8	4	30	9	43	8	53
9	5	50	11	0	10	10
10	6	58	1	28	10	38
11	7	53	2	23	1	33
12	8	39	2	23	2	19
13	9	20	3	50	3	3
14	9	58	4	25	3	39
15	10	35	5	5	4	15
16	11	11	5	41	4	58
17	11	48	6	18	5	28
18	0	6	6	36	6	46
19	0	45	7	15	6	26
20	1	31	8	1	7	11
21	2	22	8	53	8	2
22	3	29	9	9	9	9
23	4	47	11	17	10	27
24	6	6	0	36	11	46
25	7	11	1	41	1	51
26	8	48	2	35	2	45
27	8	48	3	18	3	18
28	9	28	3	53	3	8
29	9	28	3	53	3	8

* At Marlborough the tide is three hours earlier than at Nelson. Thus, at full and change it is High Water at Nelson at 9.50, and at Marlborough at 6.30.

ECLIPSES IN 1868.

DURING this year there will be two Eclipses of the Sun and a Transit of Mercury over the Sun's disc.

I.—An annular Eclipse of the Sun, invisible both in England and New Zealand. The following are reduced to mean time at Lyttelton:—

- Begins on the earth generally—
February 23, 10h. 48m. p.m., in longitude 78 deg. 8 min. west; latitude 12 deg. 54 min. south.
- Central eclipse begins generally—
February 23, 11h. 55m. p.m., in longitude 94 deg. 40 min. west; latitude 11 deg. 26 min. south.
- Central eclipse begins at noon—
February 24, 1h. 54m. a.m., in longitude 32 deg. 29 min. west; latitude 5 deg. 46 min. south.
- Central eclipse ends generally—
February 24, 3h. 49m. a.m., in longitude 25 deg. 20 min. east; latitude 19 deg. 26 min. north.
- Ends on the earth generally—
February 24, 4h. 56m. a.m., in longitude 8 deg. 48 min. east; latitude 17 deg. 59 min. north.

II.—A total Eclipse of the Sun, invisible both in England and New Zealand. The following are reduced to mean time at Lyttelton:—

- Begins on the earth generally—
August 18, 2h. 5m. p.m., in longitude 49 deg. 25 min. east; latitude 12 deg. 6 min. north.
- Central eclipse begins generally—
August 18, 2h. p.m., in longitude 35 deg. 55 min. east; latitude 11 deg. 13 min. north.
- Central eclipse at noon—
August 18, 4h. 44m. p.m., in longitude 102 deg. 38 min. east; latitude 10 deg. 27 min. north.
- Central eclipse ends generally—
August 18, 6h. 25m. p.m., in longitude 163 deg. 27 min. east; latitude 16 deg. 15 min. south.
- Ends on the earth generally—
August 18, 7h. 20m. p.m., in longitude 149 deg. 59 min. east; latitude 15 deg. 23 min. south.

III.—A Transit of Mercury over the Sun's disc, partly visible in England. The following are reduced to mean time at Lyttelton:—

- With reference to the centre of the earth—
- External contact at ingress - - - - - November 5, 4h. 55m. p.m.
 - Least distance of centres, 12 min. 15 sec. - - - - - November 5, 6h. 44m. p.m.
 - External contact at egress - - - - - November 5, 9h. 33m. p.m.