NZE 39-(EQC 1999/337)

Historical documents relating to the 1848 Marlborough earthquakes, New Zealand

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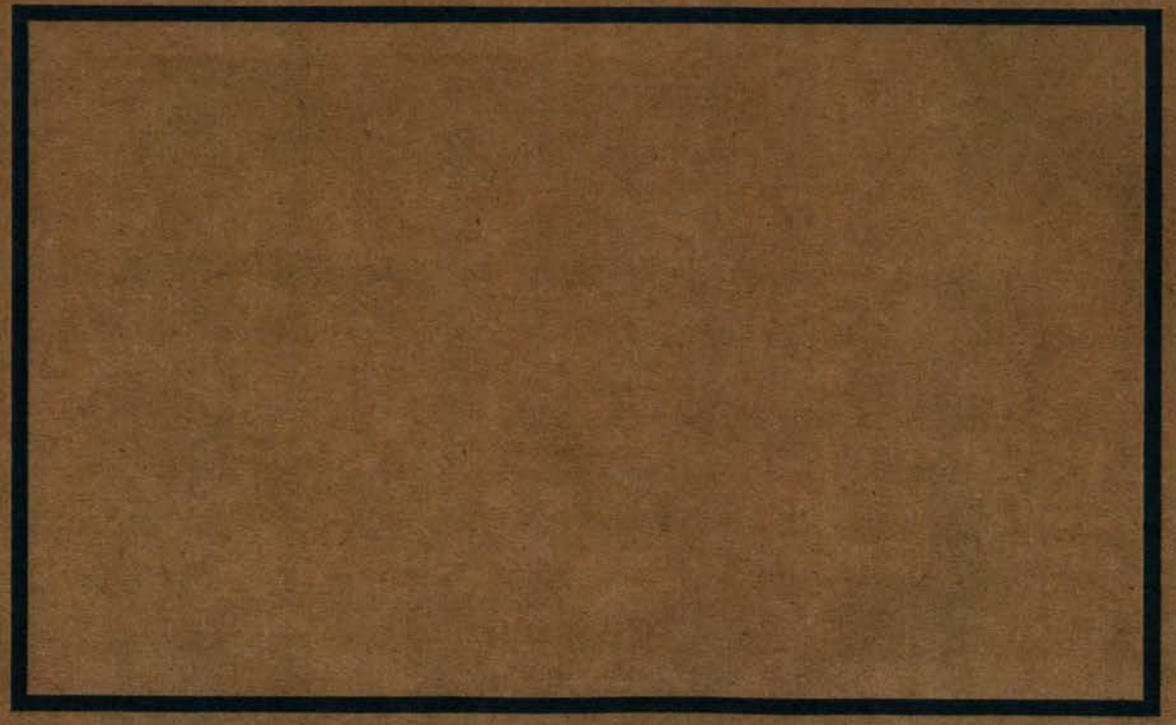

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NZE 039

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Science Report

2003/34

December 2003

by R Grapes, G Downes & A Goh

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Institute of Geological & Nuclear Sciences science report 2003/34

Institute of Geological & Nuclear Sciences Limited
Lower Hutt, New Zealand

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BIBLIOGRAPHIC REFERENCE

Grapes, R., Downes, G. & Goh, A., 2003. Historical documents relating to the 1848 Marlborough earthquakes, New Zealand, *Institute of Geological & Nuclear Sciences science report* 2003/34 *231* p.

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ISSN 1171-9184
ISBN 0-478-09831-6

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ABSTRACT

The sequence of earthquakes referred to as the 1848 Marlborough earthquakes began on Monday, October 16 1848 with an estimated magnitude 7.5 earthquake at shallow depth, which caused surface faulting in the Marlborough area, South Island, New Zealand. The sequence included many moderate and small magnitude aftershocks, as well as several large aftershocks. This science report is a compilation of transcriptions of over 200 descriptive accounts and extracts relating to the effects of the 1848 Marlborough earthquakes. These extracts represent information known to Grapes et al. (1998) and used in their relocation of the mainshock from the Wairau Fault to the Awatere Fault.

KEYWORDS

New Zealand, historical earthquakes, 1848 Marlborough earthquake

This publication has been made possible through research grants from the Earthquake Commission Research Foundation (principal funding agency) and the Foundation for Research, Science and Technology.

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1.0 INTRODUCTION

This compilation comprises transcriptions of over 200 descriptive accounts and extracts relating to the effects of the 1848 Marlborough earthquakes. The extracts are arranged in alphabetical order, principally reflecting the surname of the person who originally recorded, orally or in written form, the information in the transcriptions. Material is also occasionally recorded under *Journal name* or *Government Report*, while newspaper accounts are collected under the one heading *Newspaper and Magazines*. As with the compilation of Downes & Grapes (1999) for the 1855 earthquake, this monograph is designed so that it can be readily made into a searchable computer data base in that extracts relating to a particular location or particular effects can be quickly obtained as they are key-worded for location, and reliability and effects keywords, as indicated in Table 1. Note that first-hand accounts are regarded as primary, as are geological observations. Full references and where possible, cross-references are given. Where appropriate, extracts are accompanied by additional information in the form of *Notes*. Background material mainly relating to the greater Wellington region as written in April 1848 is also provided. A summary of the main facts relating to the Marlborough earthquakes, including a revised isoseismal map from Grapes, Little & Downes (1998), is also given.

Reliability, event and effects keywords

reliability	event	effects
primary primary/reminiscence secondary	mainshock aftershocks background information	artesian well effects artworks/maps/charts atmospheric effects biological effects building damage casualty/injury faulting ground damage response/recovery tsunami/seiche uplift/subsidence volcanic effects

Notes:
primary - contemporary eyewitness account
primary/reminiscence - eyewitness reminiscences
secondary - second or third hand account
artworks - sketches and paintings portraying earthquake effects
background - relevant background information, mainly relating to uplift/subsidence, building construction techniques, or social conditions
Other keywords are self-explanatory.

Care has been taken to ensure that the extracts are accurate although we cannot guarantee that all the transcriptions are correct. Indeed, due to the difficulty of deciphering some handwriting, several extracts contain blanks where a word or words could not be read. Some punctuation has been added for ease of reading and obvious spelling mistakes have been corrected. Those wishing to publish material that is contained in this database should always obtain the original from the organisation holding it and also seek permission to publish.

Many of the extracts in this compilation were collected by the late George Eiby whose enthusiasm for history and seismology initiated studies of New Zealand historical earthquakes. The Eiby material formed the basis of his monograph entitled "The Marlborough earthquakes of 1848", which was published in 1980. This compilation greatly extends that of Eiby as in the interim many more extracts relating to the earthquakes have come to light. Where possible those who contributed to Eiby's collection of archival material are named with the respective abstract but for those that are not we hope that they accept our appreciation of their efforts. There are a number of people who have helped/ contributed to our extension of available material over the last three years. In particular we are grateful to the untiring assistance and advice of the staff of the Alexander Turnbull Library, National Library of New Zealand (NLNZ), and the National Archives, Wellington. Individuals, such as Sallie Rowe (School of Earth Sciences, VUW), Roberta McIntyre (Stout Research Centre, VUW) and Te Ripowai Higgins (School of Maori Studies, VUW) are thanked for their help with translation and interpretation of the brief but important Horomona Pa extract.

2.0 SUMMARY OF THE 1848 MARLBOROUGH EARTHQUAKE SEQUENCE

The sequence of earthquakes referred to as the 1848 Marlborough earthquakes began on Monday, October 16 1848. The main shock, at about 1.40 a.m. (local time), was felt over a large part of New Zealand, from at least Hawke's Bay, North Island, to Canterbury, South Island (Figure 1). The extent of surface fault rupture as well as the isoseismal map (Grapes *et al.* 1998) indicate that the first shock had a magnitude of at least M7.4-7.5 with an epicentre located at 41.8°S 173.7°E. This location approximates the centre of that part of the Awatere Fault that, according to historical documents, ruptured in 1848. Aftershocks were very numerous. Two, on October 17th at 3.40 p.m., and October 19th at 5 a.m., were noted as particularly severe in Wellington, completing the damage caused by the first and main shock. Three lives were lost due to a collapse of a brick wall during the aftershock on October 17th. Aftershocks, summarised in Table 1, continued for many months, until January and possibly until August 1849. Reports of aftershocks come principally from Wellington. The most comprehensive compilations of aftershocks were made by Judge Chapman at Karori (a suburb of present-day Wellington) and Captain R. A. Oliver of the HMS *Fly*, which was anchored in Lambton Harbour, Wellington.

Ground deformation (fissuring, liquefaction, landsliding/rock falls) was reported from Wellington, Hutt Valley, Horowhenua, Manawatu, Wanganui, southeast Wairarapa coastal area, coastal Wellington, and in the Awatere and lower Wairau valleys. Evidence from newspaper reports, diaries and journals, related first-hand information, an 1854 survey map of the lower part of the Awatere Valley, and reports by geologists between 1856 and 1890, indicates that surface rupturing occurred on the Awatere Fault and not on the Wairau Fault as previously inferred by Eiby (1980) (see Grapes *et al.* 1998). The rupture was initially

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described as a "fissure", "crack" and later as a "rent", and although it extended for ca.105 km (from the Marlborough coast to at least Barefells Pass), it was not termed a fault at the time because displacement of the land surface across the rupture could not be determined. The coincidence of the 1848 earthquake "rent" and the Awatere Fault was first demonstrated by Alexander McKay in 1885 (see Grapes *et al.* 1998).

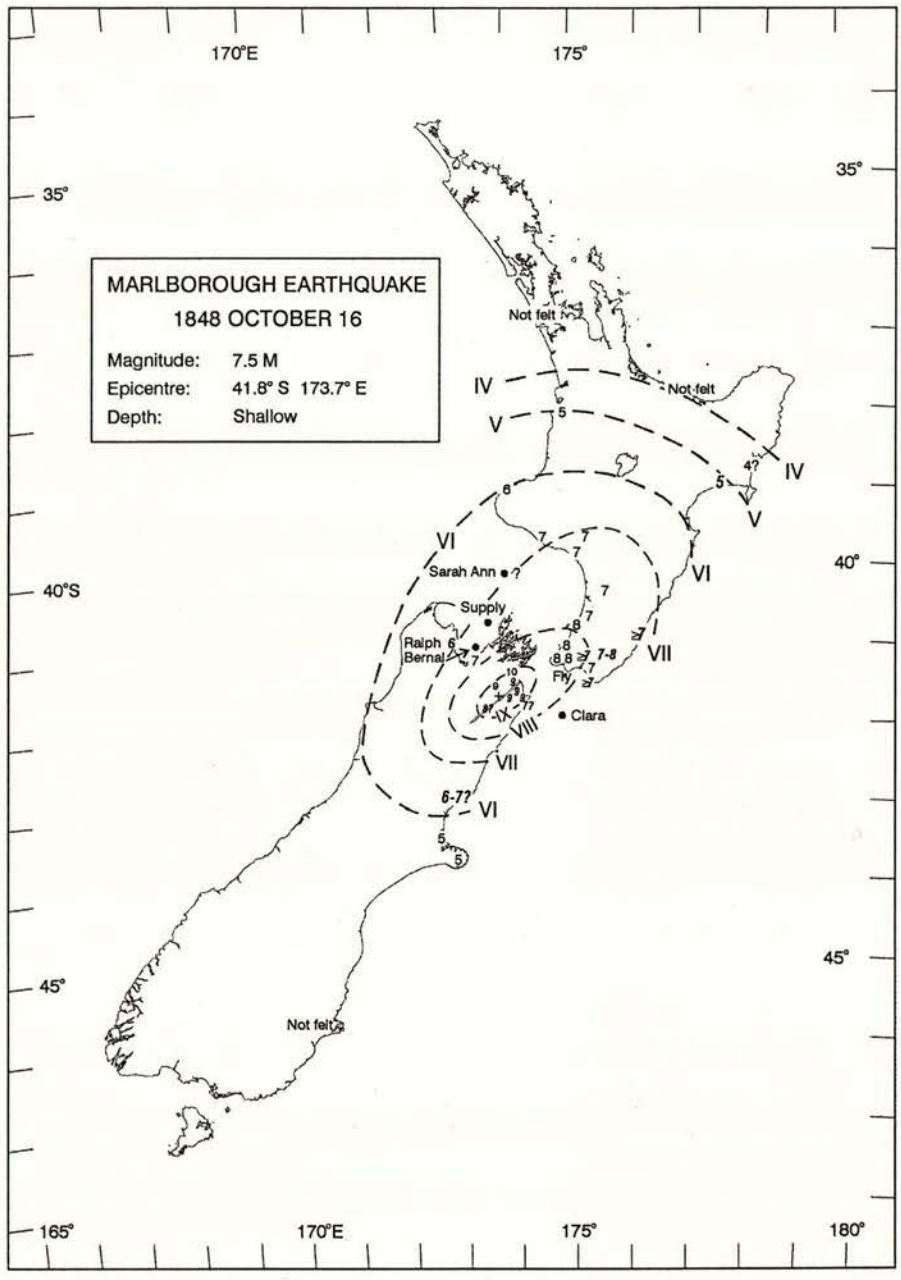

Figure 1

Isoseismal map (Modified Mercalli (MM) Scale) of the 1848 October 16 Earthquake (after Grapes *et al.* 1998). Filled dots accompanied by names show the locations of ships that felt the earthquake. Note that the date of the earthquake is given in Universal Time in this figure.

Table 1

The 1848 Marlborough earthquake sequence (commencing 16 October 1848)

Month	Day and date	Local Time h. m	Class*	Description at Wellington	Description at other locations
October	Monday 16	01 40	B	Main shock; strong for 2 minutes, vibrations for ten minutes. For one hour following mainshock vibration excessive - every few minutes increasing to a shock.	New Plymouth - violent shock; Wairoa - severe earthquake; Wanganui - lasted 4 minutes; earth trembling for ~1 hr; Nelson - longest & strongest experienced; Wairau - very violent; Akaroa - lasted about 3 min.
		03 00	D	Slight shock	
		04 00	D	Possibly 100 shocks before 6.a.m. diminishing in force with time.	
		05 45	C	Smart shock	
		07 30	D		
		08 09	D	45 shocks felt up to 8am.	
		10 15	D		
		12 00	C	Smart shock	
		12 20	D		
		14 00	D		
		15 00	D		
		15 30	C	Smart shock	
		16 00	D		
		17 15	D		
		19 30	D		
		20 00	D		
		22 45	D	Light shocks during the night	
	Tuesday 17			Shocks all day	Nelson - constant tremor
		00 30	D		Wanganui - several shocks; one rather smart
		04 00±	D	Light shock	
		07 30	C	Severe shock	
		12 00±	[B]		
		15 40	B	Strong shock (18 minutes), followed in "quick succession by another of ~ 30 seconds duration	Nelson - preceded and followed by many minor tremors; New Plymouth - slight tremor
		19 00	D	Shock	
		19 43	C	Severe shock	

Month	Day and date	Local Time h. m	Class*	Description at Wellington	Description at other locations
	Wednesday 18			Shocks throughout 17th and 18th; none strong; earth in constant agitation	
		00 05	D	Two shocks	
		00 40	C	Severe shock	
		13 50	D	Light shock	
				Afternoon and evening slight shocks felt	
	Thursday 19	05 03	B	Severe shock; second principal aftershock lasting ~50 seconds. For the next half hour there were 10 shocks; during following 24 hours several shocks felt	New Plymouth- felt off Stephens Island - felt; Wanganui - very severe but not as severe as shock of 16th; several eq felt during the day; large portion of Mt. Hikurangi shaken down. Nelson - several shocks felt in morning, but none as violent as 16th. South Wairarapa - Pa destroyed; methane ignited-Turanganui); Wairoa - felt
		07 30	D	Strong shock	
		23 00	D	Two alarming tremblings	
		23 50	D	Strong shock	
	Friday 20			Shocks *in* quick succession all night of 19-20th. 13 successive shocks, more or less severe with slight intervening shocks at intervals	
		11 10	D	Shock	
	Saturday 21			Shocks frequent	
		03 35	D	Several slight shocks between 3.35 and 3.40 a.m.	
		09 00	D	Shock	
		20 55	D	Shock	
		21 50	D	Shock	
	Sunday 22			Several slight shocks; shocks at intervals of 3 to 4 hours; about every hour; sometimes heard and not felt	
		10 00	D	Slight shock	
		15 55	C	Severe shock	
		23 40	C	Strong shock	
		23 58	C	Strong Shock (possibly same as previous)	

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Month	Day and date	Local Time h. m	Class*	Description at Wellington	Description at other locations
	Monday 23			Slight shocks. Shocks rather frequent, about every half hour but not strong.	
		01 15	D	Shock	
		01 30	D	Shock	
		03 55	D	Shock	
		12 55	D		
		14 30±	D		
		15 30	D		
		21 49		Strong shock	
		22 20	D	Slight shock	
	Tuesday 24			Slight quivers felt during the night	
		01 40	D		
		02 00	C	Sharpish shock	
		02 25	D	Slight shock	
		13 50	D	Slight tremble	
		14 06	B	Shock; caused damage; four severe shocks within 3 minutes, the second of which was extremely violent	
		14 25	D	Shock	
		14 30	D	Shock	
		15 11	D	Shock	
		15 25	D	Shock	
		16 00	D	Shock	
		16 40	D	Shock	
		17 40	D	Shock	
		17 45	D	Very sharp shock	
		17 50	C	Stronger than previous shock	
		17 57	D	Shock	
		18 00	D	Shock	
		18 12	D	Shock	
		18 33	D	Shock	
		18 40	D	Shock	
		19 55	D	Shock	
		20 08	D	Shock	
		20 45	D	Shock	
		21 00	D	Shock	
		21 05	D	Shock	
		21 15	D	Shock	
		21 20	D	Shock	
		21 49	D	Shock	

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Month	Day and date	Local Time h. m	Class*	Description at Wellington	Description at other locations
		23 15	D	Shock 30 shocks from 2 until 4 p.m. about every 7-8 minutes Shocks from 10 - 12 o'clock very frequent - about 10 per hour	
	Wednesday 25			Slight shocks nearly every 10 minutes	
		00 05	D	Shock	
		00 30	D	Shock	
		00 40	D	Shock	
		00 50	D	Shock	
		01 10	D	Shock	
		02 20	D	Shock	
		02 30	D	Shock	
		02 55	D	Shock	
		03 50	D	Shock	
		05 20	C	Rather severe shock	
		07 09	D	Slight shocks	
		20 15	D	Slight shock	
		21 05	D	Slight shock	
		23 05	D	Slight shock	
	Thursday 26	00 55	D	Slight shock	
		01 30	C	Rather severe shock	
		03 35	C	Rather severe shock	
	Friday 27			Five or six shocks	
	Saturday 28			None recorded	
	Sunday 29	01 35	D	Slight shock	Wairau. Heavy shock felt. Te Rauparaha said to be thrown out of bed (at unknown time)
		02 30	D	Slight shock	
		03 00	D	Slight shock	
		03 10	D	Slight shock Slight shock during night	
	Monday 30			Two or three shocks in the night	Nelson - two slight shocks in evening
	Tuesday 31			One shock during the night	
		15 00	D		
		19 30	C	Severe shock; also described as a smart shock	Nelson - smart shock

Month	Day and date	Local Time h. m	Class*	Description at Wellington	Description at other locations
November	Wednesday 1			No shocks during the night	
	Thursday 2			Several shocks in morning	
	Friday 3	03 05	D	Shock	
		03 10	D	Shock	
		03 50	D	Shock	
		19 25	D	Slight shock	
		23 10	D	Slight shock	
	Saturday 4			One or two shocks during the night	
	Sunday 5			Occasional light shocks	
		15 00	D	Slight shock	
	Monday 6			A few light shocks	
		19 00	D		
	Tuesday 7			A few shocks during day	
		20 30	D		
	Wednesday 8	00 20	D		
		08 15	D		
		09 00	D		
		12 45	D		
		13 45	D		
		15 10	D		
		20 00	C	Heavy shock	
	Thursday 9	01 00	D		
	Friday 10	01 15	D		
		03 15	D		
		11 30	D		
		13 15	D		
		21 07	D		
	Saturday 11	04 00	D	One shock between 11 and 12 p.m.	

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Month	Day and date	Local Time h. m	Class*	Description at Wellington	Description at other locations
	Sunday 12	14 00	D		
			D	One shock at night	
	Monday 13				
	Tuesday 14			A few rumblings	
		15 00	D		
		23 00	D		
	Wednesday 15			A few shocks and rumblings	
		12 00	D		
		12 30	D		
		13 00	C	Smart shock	
		14 00	D		
	Thursday 16			Some shocks in the night	
		07 00	D	Shock	
		15 15	C	Heavy shock	
		24 00	C	Very sharp shock	
	Friday 17				
	Saturday 18			A few shocks during day and night	
		15 00	D		
	Sunday 19	21 14	D	Slight shock	
	Wednesday 29	13 30	C	Violent shock	
		13 30±	D		
		13 35	D		
		30 17	D		
December	Tuesday 5	08 00	D	Loud report heard Throughout Dec. only 5 days where no shocks were recognised	

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Month	Day and date	Local Time h. m	Class*	Description at Wellington	Description at other locations
1849					
January	12		D	Up to the 12th January slight shocks at rate of from 1 to 5 per day After 11th January - 4 days without shocks	
	16		D	Slight shock	
	19		D	Four shocks	
	20		D	Three or four sight shock in the night	
	24	23 30	D		
February	14	14 20	C	Sharp shock (lasted 25-30 seconds & was sharper than any since October 1848)	
		16 24	D		
				During February continual shocks on 10 days out of 24	
May	03	13 00	C	Moderate shock (stopped clock and set bells ringing)	
		13 15	C	Very sharp shock	
		16 00	D		
	06	01 00	D		
October	2			Slight shock and rumble	
December	16			Shocks reduced to "average", or less, rate	

* A — Major earthquakes with probable magnitudes of 7.5 or greater
B —Strong earthquakes with probable magnitudes of 6 to 7.5
C — Moderate earthquakes with probable magnitudes of 4.5 to 6
D — Small earthquakes with probable magnitudes less than 4.5

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2.1 Acknowledgements

This work has been funded principally through a research grant from the Research Foundation of the Earthquake Commission (Project 99/337) and their support is gratefully acknowledged. Gaye Downes has also been funded through the Foundation for Research, Science & Technology. Nick Perrin, GNS, is thanked for his careful review of the text.

2.2 References

Downes, G. and R. Grapes (1999): The 1855 Wairarapa, New Zealand earthquake – historical data. *Institute of Geological and Nuclear Sciences science report* 99/16, 267p.

Eiby, G. A. (1980): The Marlborough earthquakes of 1848. *DSIR Bulletin* 225. Wellington, New Zealand: Government printer. 82p.

Grapes, R., T. Little and G. Downes (1998): Rupturing of the Awatere Fault during the 1848 October 16 Marlborough earthquake, New Zealand: historical and present day evidence. *New Zealand Journal of Geology and Geophysics* 41, 387-399.

2.3 Other references relating to the 1848 earthquakes

Eiby, G. A. (1973): A descriptive catalogue of New Zealand earthquakes. Part 2. Shocks felt from 1846 to 1854. *New Zealand Journal of Geology and Geophysics* 16, 857-907.

Grapes, R. and A. Goh (2000): Marlborough: just over 150 years of earthquakes. *Nelson Historical Society Journal*, Vol.6 (No.3), 4-32.

3.0 BACKGROUND INFORMATION ON WELLINGTON CONDITIONS IN 1848

A report by Captain T. B. Collinson of the Royal Engineers (Miscellaneous, [Public Record Office – War Office] WO55/1558, Micro 423, Archives n z, Te Whare Tohu Tuhituhinga o Aotearoa, Wellington Office, NZ), written in Arpil 1848 on the greater Wellington district is useful in setting the scene for the extracts relating to the earthquakes that occurred in October of that year.

REPORT OF THE DISTRICT OF PORT NICHOLSON APRIL 1848

GENERAL POSITION

Captain Cook states that the New Zealand islands are situated between the latitudes of 34° and 48° south and the longitudes of 181° and 194° west.

The Northern of these islands lies about N.W. and S.E. and is 500 miles long; the middle island lies about N.E. and S.W. and is 550 miles long; Cooks Straits divides the two, in a direction about N.W. and S.E. The northern island is called New Ulster in the Government maps, the middle island is New Munster.

The New Zealand Company formed four settlements in Cooks Straits between 1840 – 43, namely; Port Nicholson or Wellington; 2nd New Plymouth or Taranaki; 3rd Nelson; 4th Wanganui. Port Nicholson was the first and principal of their settlements; and is the subject of this report.

It is near the southern point of the northern island in the narrowest part of Cooks Straits; and is a harbour about 5 miles square divided from the sea by a narrow line of hills, having a narrow entrance in the S.E. corner. In the S.W. corner is a small bay called Lampton's [Lambton] Harbour along the western shore of which is the town of Wellington. At the northern end of the harbour is the valley of the Hutt, a flat wooded valley running N.E. about 20 miles, at the head of which and about 58 miles N.E. of Port Nicholson is a range of mountains several 1000 feet high called Tararua, from which two branch ranges extend, one on each side of the Hutt Valley and down to the coast. That on the east side is called the Rimutaka, and reaches the coast at Turakirai [Turakirae] Point; on the east of it again is a broad plain or valley called the Wairarapa; it extends N.E. about 60 miles and 15 broad and comes out into Palliser Bay. That on the west side has no particular name; it reaches the coast at Cape Tarawiti [Terawhiti] and extends as far north as a place called Pakakariki [Paekakariki] on the coast 30 miles from Port Nicholson including in its range a small harbour called Porirua. At Pakakiriki the hills recede from the sea, leaving a belt of flat land between the foot of them and the coast; which extends all the way to New Plymouth round Cape Egmont, a distance of 250 miles.

The plains of the Wairarapa valley, and also this belt of flat land on the coast, are both suitable land for agricultural purposes, and are already made use of for grazing cattle --- But in order to reach them from Port Nicholson it is necessary to pass over one or the other of the mountain ranges above mentioned; which are from 700 to 1000 feet high, steep, intersected with winding valleys, and covered with thick forest to the summit; in short impassable for traffic, except by a made roadway.

ROADS

Two roads are in progress of formation by the Colonial Government to open communication between these two districts and Port Nicholson.

WAINERATA [WAIRARAPA]

1. To the Wairarapa, which is carried from Wellington along the beach of Port Nicholson 6 miles to the mouth of the Hutt valley, a native place called Petoni [Petone]; and then along the flat valley of the Hutt, passing though a gorge at 15 miles from Wellington, dividing the valley into the upper and lower Hutt as far as a stream called the Mungaroa. 25 miles from Wellington.; which is as far as it is practicable for carriages at present. By the end of this year there will be a bridle road from this point over the Rimutaka hills into the Wairarapa valley, reaching the plain a few miles above the head of the Lake, or about half way up its entire length, and 40 miles from Wellington.

COAST

2. The coast road, which leaves the former road at the beach 1 mile out of Wellington, and crosses over the hills to Porirua harbour, coming on to it at the head of the south arm at a place called Jacksons Ferry 13 miles from Wellington, which is as far as it is practicable for carriages at present; but at the end of the year a bridle road will be opened from this point passing along the shore, round the head of the northern arm by a place called Pauatahanui or Patanui, 20 miles from Wellington; and from thence through an almost level valley called the Horokire [Horokiwi], towards the coast; at the head of which it rises over the hills, and reaches the flat belt on the coast at a place called Wainui, 3 miles beyond Pakakariki; and 32 miles from Wellington. From thence, a cart can pass along the beach by crossing the streams at low water as far as the Manawatu river bomiles from Wellington

   It is the present intention of the Col. Government to complete these, as carriage roads, through their entire length.

3. Besides these two roads there are some bridle paths, and footpaths over the country. To go from Wellington to the Wairarapa there is a bridle path round the coast from the east side of Port Nicholson into Palliser Bay, which has hitherto been used for cattle.

4. From Wellington to the coast northward, the natives used formerly to go along the coast almost the whole way, and

5. There is also a bridle path from Porirua harbour to the open beach at Pakakiriki. It commences from the end of the cart road at Jacksons Ferry, keeping along the west shore of that arm to the junction of the two arms, which is the narrowest part of the water, and must be crossed there by the ferry boat and swimming the horse, to a point on the opposite side called Paremata Point where there is a military station 16 miles from Wellington; and from thence along the beach to westward to a native place called Taupo, and over the hills to the coast at a native place called Pukerua 22 miles from Wellington, where it descends the cliff to the beach, and follows that to Wareroa 27 miles from Wellington by this route.

6. Between Porirua harbour and the Hutt valley there are three paths used by the natives, one from Petoni at the mouth of the Hutt; coming out on to the east road, 4 miles short of Jacksons Ferry; this is called the Korokoro road.

7. One from a place called Boulcotts, 5 miles up the Hutt from Petoni, over the hills, coming out at Patanui; this is called the Paritaki [or Par pako] road.

8. One from the east road half way between the gorge and Mungaroa over the hills coming out at Patanui; this is called the Parehurehu [or Purehurehu] road and is seldom used.

9. On the sea coast about half way between the Entrance to Port Nicholson and Porirua, is a native place called Oharui [Ohariu?], there are two paths from Wellington to it; one going straight to it over the hills from the north end of Wellington which is called the Otari path; and one by a place called Karori 3 miles S.W. of Wellington among the hills.

10. The first 4 miles of this line, to a mile beyond Karori, is a cart road.

11. There is a cart road from Wellington to the southward towards the entrance to Port Nicholson.

12. There is a path used by the natives from the coast near Wainui to Wairarapa valley, passing across the head of the Hutt valley, and crossing the Rimutaka 1/2 mile north of the bridle road.

These are about all the paths in the neighbourhood of Port Nicholson; none of these are available for the passage of troops except those called carriage or cart roads; and as the whole country is more or less covered with forest, it cannot be reckoned upon that troops could move for any distance across the country off these roads. And if from any cause troops should proceed towards the Wairarapa, it is not probable they will be able to move across that valley beyond the end of the road.

Although the natives do commonly make use of the above paths, yet in an emergency they can and do make paths for themselves across the country in any direction.

WATER COMMUNICATION

1. With respect to communication by water in the neighbourhood of Port Nicholson, the harbour is a safe anchorage for any vessel when she once gets into it; but as the prevailent winds blow in the direction of Cooks Straits N.W. or S.E. and are generally pretty strong, sailing vessels are frequently unable to get through the narrows of the straits; or to go in or out of Port Nicholson for several days especially as the wind which is a fair one coming through Cooks Straits from the north, is for entering Port Nicholson and visa versa.

There is a safe landing at Wellington beach, at any time, and along the beach to Petoni; and also on the beach at the mouth of the Hutt valley, except in strong S.E. winds, vessels of not more than 9 feet draught can enter the Hutt river at high water; boats can go up the river within a mile of the Bridge of the road.

2. In a N.W. wind boats can land in Lyall's bay, and in the bay west of it inside an island there [Island Bay].

3. There is a safe landing in Porirua harbour except in a very strong N.W. wind. Any vessel can get shelter under the island of Mana, which is 5 miles S.W. of Porirua harbour in a S.E. wind; or under the north head of the harbour in a N.W. wind. Vessels

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under 12 feet draught can go up as far as Paremata point; boats can go up to Jacksons Ferry at all times and to Patanui at high water and to a point 1/2 mile short of it, on the north side called Ration point at low water.

4. There is a landing any where on the beach north of Pakakariki in moderate weather; the most favourable place is Hurve? 5 miles north of Wainui. Immediately opposite to it and 7 miles distant is the island of Kapiti, where any vessel can get shelter in either winds.

5. Boats land in Palliser Bay in fine weather.

INHABITATION

The European settlers in the neighbourhood of Port Nicholson amount to about 4,500 souls; of which 1500 are men capable of bearing arms. The greatest number of these are in the town of Wellington; about 1000 are in the Hutt Valley; about 50 in the Wairarapa; about 150 among the hills between Port Nicholson and Porirua and in that harbour; and over and above these there are probably 50 scattered along the coast between Wainui and Wanganui.

The district of Port Nicholson and Porirua, that is to say, the territory of the New Zealand Company in this part of New Zealand, as defined by the Crown Grants given to them in February 1848, is bounded on the north by a line running over Pawaka [or Pawaha] Mountain near Wainui on the north coast, to Pawakataka on the River Hutt, and down the crest of the Rimutaka range to Turakirae point, being about 35 miles by 20, and containing about 280,000 acres. Those who are within this boundary are owners of the land they are on, having purchased from the New Zealand Company, those who are without the boundary in the Wairarapa and on the coast, have private agreements with the natives by which they are suffered to occupy.

The occupation of most of the inhabitants, being those in and about Wellington, is trade and mechanics work on the labour attendant thereon, the trade consists in importing European goods to sell to the natives, or cattle, flour, or other supplies for the troops, in return for which they receive money; which is spent in the district by the Government in the rations, buildings and other works connected with the troops; and in the formation of roads upon which the natives are employed. Those settlers who live between Port Nicholson and Porirua, are chiefly sawyers who cultivate a few acres, but depend mainly on their trade. Those in the Hutt are small farmers who depend partly on cultivation and partly on trade connected with the town. The Wairarapa settlers and those on the coast are stock farmers, who send wool to England, but depend chiefly on the supplying of the troops.

NATIVES

The natives have formed [fixed?] habitations where they live the greatest part of their time. Portions of a tribe collect together into one spot, and build an assemblage of huts which they surround with a high fence in the form of a square, and that constitutes a Pa. These pas are

scattered all along the coast, in the bays, one tribe extending over a considerable distance; the pas of one tribe are sometimes intermixed with those of another. They live by cultivating vegetables and by fishing; each pa has its own spots of cultivation which are sometimes close at hand and sometimes several miles off; subdivided amongst the members of the pa.

1. The tribes in this neighbourhood are; the Ngatiawas, whose pas are about the shores of Port Nicholson harbour, and along the coast to the north as far as Waikanai [Waikanae] 6 miles north of Wainui. They muster about 500 fighting men of which 200 are about to go to New Plymouth where their tribe originally came from.
2. The Ngatitoas, whose pas are about the shores of Porirua harbour and along the coast as far as Wainui. They muster about 200 fighting men.
3. The Ngatitamas, whose pas are in Port Nicholson harbour and on the coast at Oharui [Ohariu]. They muster about 50 fighting men, and are part of a tribe of the same name up the Wanganui river.
4. The Taranaki, who have one pa in Wellington; and are part of a tribe of the same name at Cape Egmont. They muster 85 fighting men.
5. The Ngatiraukawas, whose pas commence from Waikanae and are along the sea coast as far as the Manawatu river. They muster about 500 fighting men.
6. The Ngatikahuhunus, whose pas are in the Wairarapa valley and along the coast east of this island as far as Ahuriri in Hawke's bay.

Of these natives some of the Ngatiraukawas and Ngatitamas composed the war-party who made an inroad upon the Hutt valley from the coast in 1846. The Ngatiawas and Ngatitoas took pact with the Government. The Ngatikahuhunus have not interfered on either side.

MATERIALS

The building materials which can be got in Wellington, are;

1. *Bricks* in almost any quantity the ground being composed of clay for making them. They could be made in any part of the district, but as the brickmakers are established in Wellington, it is probable they would have to be transported to any other part of the neighbourhood.
2. *Stone* near Wellington is a clay schist and it is only found in small blocks, suitable only for foundations, or rough work. Granite and limestone are both to be procured from Nelson.
3. *Mortar*. Lime is generally obtained from shells, and is of a good quality; stone lime is also made in Wellington, obtained from the opposite side of Cooks Straits; there is plenty of sand free from saltwater near the beach in all the bays.
4. *Timber*. The Rimu or red Pine which is considered the best wood for scantling is to be found in great abundance at Karori, and in all the valleys between Port Nicholson and Porirua. The Kahikatea or white Pine, which is a good wood for interior work is to be found in great abundance in the lower Hutt valley. The Mai or Matai a pine, is a dark

hard wood very good for water work, is to be found in the upper Hutt valley.

The Totara, a pine suitable for timbers near the ground and outside planking, is to be found in the upper Hutt valley.

The Rata, a dark tough wood suitable for ship building or machinery, is to be found between Port Nicholson and Porirua in all the valleys. The Tawai or Black Birch, a tough wood suitable for the same purposes, is to be found on the hills of the Rimutaka range. The Titoki, a very tough wood is not very abundant, but is found between Port Nicholson and Porirua. The great difficulty with regard to the supply of timber is the transport, which is carried out by bullock drays along the roads and causes great delay during the winter. Red Pine can be obtained from Nelson in considerable quantities; and Totara and white Pine from the Manawatu river.

5. *Shingles* for roofing can be procured in any quantity.
6. ???, glass, paint and fitments etc etc can be procured from Sydney.

LABOUR

There are about 20 carpenters in the district and about 12 bricklayers; but the demand for labour is very great owing to the extent of the Government works so that it is not easy to get any large works executed in a short time; mechanics get 6/- a day and labourers receive 3/-. There are contractors to be had from all works that have hitherto been carried out.

TRANSPORT

This has hitherto been the chief difficulty to contend against in all services in this country. The want of transport by land and by water, there are now about 30 horse or bullock carts in Wellington, and roads by which stores could be conveyed to the head of the Hutt valley in a day, or to Porirua in half a day, and there are small trading vessels in Port Nicholson which can convey stores to Porirua or to Palliser bay or to the coast at or north of ?Wainui though they are by no means to be depended on, in consequence of the strong winds in Cooks Straits before mentioned.

PROVISIONS

The Commissariat have always been able to procure fresh provisions for the troops and it is not probable there will ever be a deficiency; as there are now 5000 head of cattle in the Wairarapa valley and on the coast, and 35,000 sheep; and in the Middle Island there are 5000[?] head of cattle and 16,000 sheep with a constant increase from Sydney; and there is a constant supply of flour from Van Diemens Land besides a small supply from Nelson and New Plymouth and the soldiers always obtain a good supply of vegetables at a moderate rate. The present contract for that is 7d a lb and for bread 2 1/2 [d] a lb.

FUEL

Wood is and will be the principal fuel in the district for some time to come, but is Wellington the wood had been cleared around the town to such a distance that it is already considered cheaper to burn coal from Sydney. The troops are supplied with wood.

DEFENCES

With respect to the defence of the town of Wellington and the district of Port Nicholson against the attacks of hostile natives, it will be seen from the above accounts of the manner in which the tribes are spread all around the district and its neighbourhood, and the natives of the country that it is not possible by a system of outposts to contain and defend a district of country against their incursions and moreover the district which is not confined to the boundaries of the Crown Grant, will probably be enlarged from year to year and three outposts which are now in the district will no longer be of use and further it is to be considered that the system of warfare that will in all probability be pursued by the natives if any of them should rise in hostility will be to take to the mountains and forests and harass the outsettlers from a country unapproachable to troops; therefore it would be preferable to have the whole force of the troops collected into one central position from which they could by moved either in the direction of the Wairarapa or the coast as required: and by completing the roads in those directions as the district increases enable a large force to come suddenly upon one of the pas that showed a demonstration of hostility, and punish them before they had time to return to the mountains.

The most advantageous position for such a central depot is the town of Wellington as it commands the most secure communication with the sea, and is at the junction of the two roads to the borders of the district; from it to the Wairarapa will be two days march when the road is completed and to Wareroa on the north coast, two days march also. Beyond the end of the road to Wairarapa troops could not move at present, but along the coast they could get to the Manawatu river 60 miles from Wellington, provided ferries were established at two rivers on the way which are not fordable at high water.

A cross road of communication to enable troops to move from the coast to the Wairarapa valley would be an advantage; the best line for this road would probably be from the head of Porirua harbour to the gorge on the Hutt; this would be almost 8 miles, the Wairarapa would then be two days march from the coast.

It is also probable that Police Stations will be established on the outskirts of the district to keep up a constant communication with Wellington. The most advantageous positions for these would be the extreme ends of the roads, within one days journey of Wellington, for a single man carrying a mail. A station of this description has already been established at Waikanae on the coast 36 miles from Wellington, consisting of 11 of the colonial police who are employed also to carry the ? and mail to Wanganui. It is a good position for the station being opposite the island of Kapiti through which an almost constant communication with the sea can be maintained and being also on a river which can be entered by boats at high water. It would be a further advantage to construct these police stations of brick, with a place for storerooms as well as for the accommodation of the men so that they could serve as magazines for communication in case of military operations in their neighbourhood.

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For these reasons we recommend that the military station in Porirua harbour which is the closest [?] outstation now in the Port Nicholson district should not be retained by the ordnance as a permanent military post after the completion of that road.

Lt. G. the Governor has directed that it should be retained for the present, and the Major General commanding the forces has thereupon ordered that the troops there be supplied with every [?] barrack accommodation together with storehouses for the ordnance and commissariat stores be provided in Wellington. The manner in which it is proposed to execute this, in agreement with the considerations above mentioned concerning a central depot for the forces, is detailed in a report to the Commanding Engineer dated ? February 1848.

In addition to that report should be mentioned the defences which would be required to protect Wellington from a foreign enemy, that is, from a sudden attack by one or two vessels of war for the purpose of destroying the town; For this purpose I should recommend two batteries to be constructed in the town; one on the cliff above Windy point or Clay Point as it is called, and one behind Pipitea Point; the former would command vessels anchored in any part of Lambton Harbour or endevouring to effect a landing in it; and the latter would command the landing between Pipitea Point and Kaiwarawara; and the road, which is the only approach from that direction. The range required for these batteries would be about a mile.

DESCRIPTION OF THE MILITARY POSTS

Wellington

This part has been fully described on the report above alluded to of February 1848.

Paremata, Porirua

Paremata Point is at the junction of the two arms of Porirua harbour on the north side. It is a low sandy point of a space about 200 yards square, and behind this flat space there is a range of hills the ones nearest being ??? detached from those behind about 100 feet high and 350 yards from the barracks; the other being wooded and steep and 300ft. high. The Barrack is near the extreme of the point 50 yds. from high water mark. It is a square building, two stories high with two flanking turrets at opposite angles. In the interior the lower floor contains 4 rooms for 3 officers and a kitchen for the men, and a store room within ....., and two cells? The upper floor is entirely occupied by the men. The turrets have a story each, above that; and all three stories in them are loopholed.

The brickwork of the buildings is bad and when fires came to be built in the kitchen, the floor of the storeroom behind was burnt through. It is therefore proposed to convert this kitchen into a hospital and to repair the building generally and coat all the brickwork (quoins, windows and doors) with Roman cement to keep the rain out. It is also proposed to build a cook house for the men; one for the Officers, a Guard house and Cleaning shed being out houses required to fulfil Major General Pitts orders of Jany 1848.

The two 12 in [?] cannonades it is proposed to place on common platforms in two angles of the palisade which surrounds the Barrack.....[line missing] ..... to fire through portholes in the palisade this is an apron palisade enclosing all the out buildings. Besides this space there is about two acres of the flat reserved by the Government for the Barracks.

This Barrack was built by the Colonial Government in 1847, for the reasons before stated it is proposed that the Ordnance return possession of it at present without purchasing it.

There is also a wooden Commissariat stone house near the barrack, which will be moved inside the palisade; it was built by the Commissariat in 1846.

This storehouse will hold salt provisions for 150 men for 3 months. The magazines of the Barracks will hold 60 whole barrels.

From the barrack to the opposite point those on the S.W. side (the narrowest point) is about 200 yards.

In 1846 the troops made a large stockade near this barrack, with huts inside for 300 men. It was close to the water on the west side. It is now nearly destroyed; it was built by fatigue parties, no expense having been incurred at this post by the Ordnance to this time.

The hills round Porirua harbour are from 300 to 500 ft high, steep and wooded, to the waters edge; but at low water there is a passage for horses round the shores upon rocks and sands; there is a .....(line missing from the microfilm)

Pauatahanui

Pronounced "Patanui", is upon a promontory at the very head of the north arm; about 60ft. high with a broad summit; not commanded by any hill within musketry range; and having a small ravine on each side. On the south side is a stream 10yds. broad running through a flat and into the harbour by an intricate channel. The hill has been cleared of woods leaving an open space of nearly 100 yards round the stockade which is on the summit about 30 yards square of rough timber 6 inches diameter and 8 feet out of the ground bound together with a brace of rails tied with .....? and a second fence of lighter material 3 feet outside of the first round part of it and a ditch 4 feet deep and 6ft. wide inside, the loopholes being on ground level. It was originally built by the native chief Rangihieata in 1846 larger than at present, and was occupied by the troops on his retreat and retained until January 1848 when the Detachment was withdrawn and the stockade given over to a Military road party.

There are huts inside for 120 men; built of clay and wood; no regular magazine water is obtained from the stream below.

The bridle path to the coast crosses the stream to a ? bridge just under the stockade boats can get to the bridge at high water.

The Hutt

There have been three military posts in the Hutt; 1. Fort Richmond; 2. Boulcotts; 3. Taita, some of which are now occupied.

Fort Richmond - is near the bridge 9 miles from Wellington on the left bank. There is a large space of several 100 acres cleared about it and the houses of the Hutt village are near it. It is a stockade about 23 yards square of sawn timber 3 inches thick and 9 feet high with a banquille inside and two flanking block houses at opposite angles. It is washed by the river on two sides which is 40 yards wide. It would make a good position for a police station for the Hutt, if a brick house as before described is built in it; but the timbers are all rotten and will fall in a few months. It was built by the Colonial Government in 1845 and given up as a military post in 1848. No expense has been incurred by the Ordnance at this post.

Boulcotts

This is a wooden farm house about 2 miles further up the river and close to the left bank in a small space cleared in the wood. It was occupied by a detachment in 1846 and was a stockade of rough timber made around it by fatigue parties of the troops and huts built inside. The river washes .....? No expense has been incurred by the ordinance there.

It was near this post before the stockade was made that a detachment of soldiers under Lieut. Sage [58th] Regiment was attacked in the night by the natives but were beaten off.

Taita

This is another farm house in a clearing about 4 miles above the bridge which was a stockaded and occupied by the troops in the same mannerat the same time and was given up about the same time in 1846.

Wanganui

This is described in the report attached to the .....? of the annual Estimates for 1849-50 which completes the establishment of that post.

Note

In Wellington the Ordnance stores are kept in a hired brick building near the water edge on Te Aro flat. The office is on the beach near Government House.

The Commissariat stores are in a hired wooden building near Te Aro and in the office is a hired building in Willis Street ..... [line missing on microfilm]. Of the soldiers who are stationed in these buildings in the town, there are 100 men in a wooden building called Soldiers [Johnson's?] barrack on Te Aro beach; 80 in a wooden building on the beach near Government House; and 35? in a brick building at the north end of Thorndon Flat near the beach. The Officers provide themselves with lodgings in different parts of the town receiving an allowance of lodging money.

The Ordnance Magazine on Mount Cook will contain 730 barrels.

General Communication

The want of regular communication between the different settlements in this Colony has proved to be the greatest obstacle to the public service in operations of every kind that have been carried on.

There are eight regular settlements in New Zealand all upon the coast and the following table will show the difficulty of the communication.

Settlements	Distance miles	Average time by sailing	
		Sailing vessel days	Steam days
Auckland	700E	10	3
Bay of Islands	720W	10	3
New Plymouth	250	3	1 ½
Wanganui	120	2	1
Nelson	150	3	1
Akaroa	200	4	1 ½
Otago	400	7	2

To none of which the communications is regular [?] but only by chance traders so that in Wellington we have been several times 3 months without hearing from Auckland and then it has been via Sydney and at Wanganui we have been a month without hearing from Wellington, and that at a time when one might have made the difference of success or failure in an attack upon the natives. However, it is not possible to ensure a regular communication by sailing vessels round New Zealand where the winds blow so strong, especially through Cook's Strait. Therefore I should certainly say that to carry on operations effectually against the natives there should be a steam vessel for the sole purpose of Communication, and that should be capable of entering the principal rivers, that is to say, with above 5 feet draught of water.

There is a brig of 200 tons belonging to the Colonial Government but she has so many services to perform that the communication by her is not regular. There are about 20 small sailing vessels trading along the coast from Port Nicholson, most of which could enter the principal rivers but they cannot be depended on for regularity on account of the strong winds before mentioned. From Wellington to Wanganui they frequently take 10 days.

There is an Auckland mail from Wellington to Auckland, by Wanganui and New Plymouth. It is regular to New Plymouth but not to Auckland. It is carried by relays of the Colonial Police, on foot. It is 5? days to Wanganui; 8 days to New Plymouth and 18 to Auckland.

From Wellington to Sydney there are trades about once a month; it is 10 days sail or 5 steam. The mail from England arrives by this route.

To Hobart town it is 3 weeks sail; about once a month.
To China – 2 1/2 months about twice a year.
To England – 4 months about 3 times a year direct by Cape Horn.
Signed T. B. Collinson
Capt. R. N.
April 16th 1848

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Return of the Military Posts in the Southern District of New Zealand which have been or are in existence with a description of each and the alterations proposal agreeable to Major General Pitts' order of Jany 1848

Name	Present or Past	Proposed
Wellington		
1. Mt Cook	Barracks for 210 men in an open stockade under the hill.	Barracks for 357 men on the hill. Barracks for 160 men. Total: 473 Also officers quarters, hospital, commissariat and ordinance stores in a defensible palisade.
2. Thorndon	Barracks for 90 men in an open stockade.	The same and officers quarters. Total 81
3. In the town	3 hired buildings; 1 in Te Aro, 1 near Government House and 1 on Thorndon, for 200 men.	To be given up. Total in Wellington 500
The Hutt		
1. Fort Richmond	A bullet-proof stockade at the Bridge, with huts inside; Built by the Company in 1846 for 50 men.	Reanced to a Sergeants guard March 1848
2. Boulcotts	A stockade with huts inside for 50 men built by fatigue parties in 1846.	Given up in 1846
3. The Taita	A stockade with huts inside for 50 men built by fatigue parties in 1846.	Given up 1846 Total in the Hutt – 0
Porirua		
Paremata	In 1846 a stockade with huts inside for 200 men built by fatigue parties. In 1847 a stone barrack for 60 men built by the colony.	The same
Pauatahanui	A stockade with hits inside for 100 men built by fatigue parties in 1846.	Given up February 1846. Now occupied by a military road party. Total at Porirua 60
Wanganui		
Rutland Stockade	A stockade with huts inside for 200 men	To be enlarged and two brick house & barracks placed inside for 200 men Officers quarters and storehouses.
York Stockade	Ditto	To be given up Total at Wanganui 200

4.0 EXTRACTS RELATING TO THE 1848 EARTHQUAKES

Adams, C. Warren

Source: Adams, C. Warren (1853): *A Spring in the Canterbury Settlement.* London: Longman, Brown, Green, and Longmans.

Location: North Canterbury, Canterbury

Keywords: primary, background, ground damage

Crossing a range of hills on our left, we gained the Waipara Plain, which is apparently somewhat more fertile than that in which Canterbury is place. It is, however, much intersected with swamps and deep gullies; and, therefore, having crossed the Waipara, a river of about equal size with the Ashley, we ascended the Limestone Range on our right, and held our course along its summit in the direction of Mr. Caverhill's station at Motunau.

The Limestone Range is a range of hills of great height, which runs northward at a distance of about four miles from the coast. Along its summit there runs, what from the foot of the hill appears to be a wall of large limestones; but which, on a nearer inspection, proves to be a steep bank, about fifty feet in height, covered thickly with huge loose stones, which seem to have been arrested by some supernatural agency in their descent down the almost perpendicular face of the hill. .At the foot of this bank (about 50 feet in height and composed of limestone boulders) runs a very singular terrace about twenty yards in width. It is covered with short thick grass, and affords an excellent road, though very much broken by deep cracks, occasioned by earthquakes, and extending to an unknown depth. From this terrace the traveller obtains truly magnificent views of the country around. He is now in an entirely Alpine region. The hill slopes abruptly from his feet; and, from the height on which he stands, his eye wanders over miles of highly picturesque country, broken by innumerable hills of varied forms, and interspersed in the most singular manner with fertile plains. Our route was continued along this irregular road for about twenty miles, until we reached the Vulcan, a remarkable peak standing high above its fellows, and apparently flattened at the summit.

Notes:

This extract provides a possible reference to ground damage caused by the 1848 earthquakes, there being no other large earthquake recorded in the Canterbury area subsequent to 1848 until 1855 – the observation of earthquake cracks being made in 1852. The locality described refers to an outcrop of Tertiary limestone that forms a prominent ridge trending NE-SW that forms the eastern slope of Mt. Cass. Adams describes that they traveled "... about twenty miles, until we reached the Vulcan....". In fact, the distance to Mt. Vulcan from the Waipara River is only about half this distance (see also F. Strange extract relating inferred earthquake damage further south in the Torlesse Range).

Anon

Source: Anon 1 (1849): Entry from diary held at one time by Dr. Bett, Nelson. Quoted in: Stewart, William Downie (1937): *The Right Honourable Sir Francis Bell: His Life and Times*. Wellington, NZ: Butterworth.

Location: Wellington

Keywords: primary, mainshock, building damage

p.26.

January 5, 1849. Mr Poynter came and invited me to dine with Mr. Sweet and Captain Luke of the 'Fly'. We had fish and fennel sauce, mutton, pears etc. Captain Luke said that the earthquake [in Wellington] disturbed him in the night by tossing the ewer out of the basin on to the floor. From the window he saw the chimneys down and thought the other end of the town destroyed. There was a general run into the streets. On this occasion there were some scares. Miss Hort and Dillon Bell met in the terror. He recognised her with 'What! Is that you Margaret?' and she sank into his arms with 'Oh Francis' and so the marriage was settled there[*].

* See Douglas McKain entry.

Arnold, Thomas

Source: Arnold, T. (1848): Letter to his mother, dated October 10th, 1848,9 (the date when Arnold started to write the letter). *In:* Letters from New Zealand and Tasmania 1847-50. MS-Papers-0231-02-06, Alexander Turnbull Library, NLNZ.

Location: Flaxbourne, Kaikoura coast; Wairau Plain, Marlborough

Keywords: primary, mainshock, aftershocks, building damage, ground damage

p. 83.

Tues. Oct 17th ... Yesterday a little before 2 o'clock, I was awakened by feeling the bed shake under me; my first impression was that the wind was shaking the house; but Weld cried out 'An earthquake', and indeed there was no doubt as to what it was. For about a minute the bed was violently shaken from side to side; every plank in the house creaked and rattled, the bottles and glasses in the next room kept up a sort of infernal dance, and most of them fell. When the shock was past, there came a few spasmodic heavings, like long drawn breaths, and then all was still. But for the rest of the night and all yesterday there were slight shocks at intervals. In the morning we found that the kitchen chimney which is of stone, was cracked right through. And while we were out walking yesterday, we came to several large cracks in the ground, and in one place several fragments of rock had been detached from the cliff by the shock, and were scattered on the beach. There has not been an earthquake for many months before, and that is the reason I suppose, why this shock was more violent than ordinary. There has never been any serious harm done by them, so that people think very little of them now, though they used to be frightened at first.

p. 91.
One beautiful morning, several days after the great shock, Weld and I climbed a steep hill [Weld Cone] about 1200 feet high [actually 1207' or 274m], for the sake of the view. We were sitting down on the top, when a smart shock came, and we distinctly saw the whole top of the mountain heave and rock to and fro.

p. ??
Here [Big Wood] the effects of the earthquake were very apparent on the river bank; there were a great many large cracks in the ground, some as much as two feet wide; and I also saw numerous deep holes, by which a lower stratum of sand and water had burst its way thro' the overlying ground, and covered everything with sand for some distance.

Source: Arnold, T. (1900): *Passages in a Wandering Life.* London: Edward Arnold.
Location: Flaxbourne, Awatere Valley, Marlborough, Wellington
Keywords: primary/reminiscence, mainshock, aftershocks, ground damage, building damage

p. 97-99
The 16th October was a memorable day. The account of it given in the "Reminiscences" already quoted may here be extracted:

On the night, (or rather 'morning') of the 16th October, between one and two a.m. the whole household was roused from sleep by the shock of an earthquake... I awoke and found myself being rocked violently from side to side in bed, like an infant in a cradle.... The bottles in the loft above our heads kept up an insane dance and clatter; every timber in the house creaked, groaned and trembled; the dogs barked; and the shepherds (who slept in one wing of the house, Weld and I occupying the other) imagining that the end of the world had come, rushed out of the house, and did not venture to return until daylight. Weld and I remained in the house but could sleep little for the remainder of the night, owning to constant quiverings and slight movements of the earth. The sensation produced was singular and awful, its chief element being the feeling of utter insecurity, when that which we familiarly think of as the firm and solid earth was thus heaving and rolling beneath us. When it was light, we found that little or no damage had been done the house; but outside, particularly near the banks of streams and in other low situations, there were long and deep cracks. It was not till some days afterwards that we learned how destructive the earthquake had been at Wellington. Two persons had been killed and every house of stone or brick was thrown down. The shakings did not at once subside. On Sunday, six days after the earthquake, we walked to the top of Hummock, a hill about 1000 feet high. Seated on the narrow conical summit we gazed on the sublime appearance of the lesser Kaikora [sic] entirely covered with snow. While we were thus intent there came a shock of earthquake, and we distinctly saw the top of the hill on which we sat heave to and fro."

Notes:

The second account is only slightly different from that described in a letter to his mother started on October 10th. In some instances, however, the information in the extract from *Passages in a Wandering Life* is more specific.

Weld's house was a prefabricated wooden dwelling, with two wings that were connected, and had two stone chimneys.

The aftershock experienced by Arnold and Weld at the top of Weld Cone on Sunday 22 October was presumably one of two recorded in the Meteorological Tables of Captain Oliver of H.M.S "Fly" anchored in Wellington Harbour, one in the morning at 10 o'clock and the other in the afternoon at 3.55 (see Oliver extract).

The sand "blows" described by Arnold in the Big Wood area of the lower Wairau Valley and where Grovetown is now situated, are similar to those noted by Weld in his diary entry for November 2nd, namely "In the Wairau the surface crust of dry land has in some places sunk 10ft., the water spouting up through diminutive craters from the swampy subsoil". (see Weld extract).

Arnold and Weld sailed from Flaxbourne across Cloudy Bay in the "Petrel" and visited Mrs. Dougherty at Cutter's Bay on Thursday 26th October. They stayed two nights (until the 28th) before going on to Port Underwood where they anchored, climbed the hills and descended into Queen Charlotte Sound following Rev. Ironside's track. From there they walked to Waitohi (Picton) and then back to the Wairau Plain via Tua Marina where they headed for a Maori Pa situated near the Wairau River mouth. At the Pa they met Captain Dougherty who was staying in a Maori whare. The next day they were taken by Dougherty some "miles" up the Wairau River in his boat to *Big Wood* where they slept the night. The following day, Arnold went on alone up the Wairau Valley to Nelson; Weld and Dougherty returned to the Pa. The Maoris also had pas at Grovetown, Tua Marina and Gibsontown.

Bishop, Walter

Source: Bishop, Walter K. (1882): *Guide to Wellington & District, with Complete Map of the City.* Wellington, NZ: Walter K. Bishop.

Location: Wellington.

Keywords: secondary, mainshock, aftershocks, building damage, atmospheric effects, casualty

p.98

Severe Earthquakes

The settlers were placed in a great state of consternation at twenty minutes to two o'clock on Monday morning, October 16, 1848, when a most severe shock of earthquake was experienced which lasted for the space of nearly a minute; the direction of the shock appeared to be north and south; this was followed at an interval of half-an-hour by another shock not so intense as the first, and during the subsequent minutes a succession of severe shocks occurred with lesser ones at intervals; in fact, during the whole of this period, the ground appeared to be in a state of oscillation. When it became daylight it was found that several of the brick buildings had been seriously injured by the first shock which had caused the greatest amount of damage. The ships in the harbour equally felt its influence. The sensation experienced on board *H.M.S. Fly* is described to have been as though the vessel had suddenly grounded. The shock was felt most in the fore part of the ship and all the men ran up on the deck. During Monday three smart shocks occurred, and on the following morning a severe vibration was felt at about 7.30, while during the whole of this time a continuous tremulous motion of the earth was distinctly perceptible. It blew hard from the S.E. in the Monday, but on Tuesday it became perfectly calm. On the afternoon of that day (Tuesday) at 3.40 a severe shock occurred, followed in quick succession by another of about half a minute's duration, and was

equal in force to that experienced early on the previous morning but more destructive in its effects as it completed the ruin of those houses and chimneys which had previously only been damaged. The buildings rocked to and fro in a most fearful manner. All the brick stores were more or less damaged, the walls either being thrown down altogether, or bent in different directions. It was during this shock that Barrack-Serjeant Lovell and two of his children met with an accident, which resulted in their deaths. The serjeant was passing down Farish-street, accompanied by a girl of eight years and a boy about four years, when they were buried by a mass of falling wall. The girl was killed instantaneously, while her brother died after lingering several hours, and their father died two days after the occurrence. On Wednesday morning the tide rose to an unusual height, overflowing part of Lambton-quay and all the sections at the head of the bay fronting the water. During the Monday and Tuesday night a long streak of pale light was observed. It appeared to be settled at a very great distance and in a northerly direction. The barque *Subraon* was at the time lying at anchor in the harbour, and several people took advantage of an offer made by the Captain to take refuge on board. Fearful of such another such visitation, many settlers with their families determined to leave the colony for Australia, and took passage in the *Subraon*, bound for Sydney. The vessel, however in beating out of the Heads missed stays, and ran ashore, when she became a complete wreck. The whole of the passengers, (amongst whom was Sir William Fitzherbert, the present Speaker of the Legislative Council) were saved, but finding that while dangers were to be apprehended on land, there will still greater dangers on the sea, the majority again took up their residence in the land of their adoption.

Blake, A. Hope
Source: Blake, A. Hope (1909): *Sixty years in New Zealand: stories of peace and war.* Wellington, NZ: Gordon & Gotch Ltd.
Location: Wellington
Keywords: primary/reminiscence, mainshock, aftershocks

p.43
I think it was in 'forty-eight' - a month or two cannot make much difference - that about midnight a severe earthquake occurred in Wellington. Although it had generally been considered the "heaviest yet," the undulating movement merely had the same effect upon me as the rocking of the cradle from which I had not so very long since graduated. My brothers soon shook me into sensibility, and then their white and terrific faces immediately succeeded in impressing upon my youthful mind the alarming nature of the phenomenon. As far as my memory serves me, there were no more shakes of any consequence that night.

The following day happened to be the one selected for the weekly performance of the band of the 65th on Thorndon Flat. The *élite* of town and suburb generally attended in force on these occasions. On the beautiful green sward were placed chairs and camp-stools for the convenience of visitors. The magnificent band occupied the central position, their circular music-stand surrounded by the lithe forms of the musicians in their uniforms of snowy white

picked out with red, and their glittering instruments looking as spotless as though just taken from glass cases. The officers, in undress uniform, added considerably to the brightness of the scene, and last, but by no means least, there were the ladies - the wives, daughters, sisters, cousins, and aunts of the military, commercial, and professional men of the settlement. "The Flat" afforded exceptional facilities for a promenade, and on this occasion was taken advantage of to the fullest extent.

As the groups of fashionably attired women promenaded, the small fry, with whom I was associated, whiled away the happy summer hour in the engrossing game of marbles. As all were enjoying the harmonious strains of the band, or other recreations of the afternoon, a sound as of distant thunder was heard, but differing in this respect, that it seemed to occupy all space, above, below, and around - one could almost feel it, breathe it. For about twenty seconds this continued, followed by a sudden shaking, which had the socialistic effect of bringing all to the same level. The promenading couples, a moment before gliding around in all their beauty and stateliness, soon found themselves embracing Mother Earth, or prostrated in various and most undignified attitudes. Musicians, music-stands, brass instruments, and fluttering music-leaves were inextricably mixed up. This tremolo movement, which was not upon the programme, brought the performance to a close.

Although I was very young at the time, I retain a distinct recollection of the fact that everyone left the grounds in anything but a leisurely manner.

Branch, W. G.

Source: Branch, W. G. (1929): Letter, dated 16 August 1929, from W. G. Branch, Marlborough College, Blenheim, to H. T. Ferrar, Acting Director of N.Z. Geological Survey. Institute of Geological & Nuclear Sciences earthquake files EDS 843/02

Location: Marlborough, Awatere Valley, Wairau Valley

Keywords: secondary, background, faulting, ground damage

Dear Sir,

In reply to your letter of the 5th inst., I'm sorry to have to state that my friend in Wellington to whom I wrote concerning my geological observations here, must have misconstrued my letter.

I have been doing a little work on the elevated block N.W. of the Wairau Valley fault, with the view to possibly finding some relationship (a) between the schists and subschistose rocks, and (b) between the subschistose rocks and the greywacke, and any mention of "evidence of recent movement" is strictly referable to a general elevatory or tilting movement of the area under observation along the main fault.

I shall be in Wellington on Friday 23rd and would be much obliged if I could view any specimens collected from this area in the past.

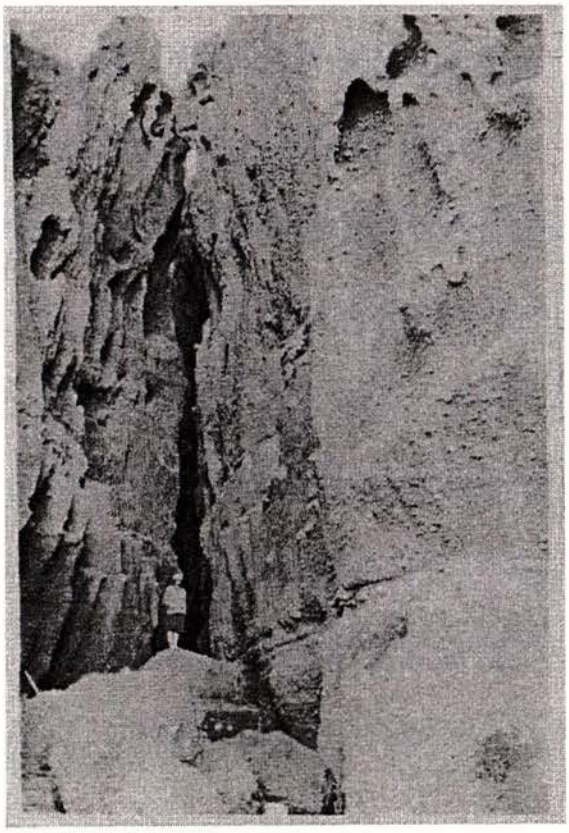
There is a story current in Blenheim that Split Peak (a point in the Vernon Hills, 2 miles south of the town) was "split" by one of the earthquakes of the past century.

Mr. Purdie of Marlboro' College, and I, have interviewed several old identities here, but could elicit no definite information as to the occurrence. It is interesting to note, however, that the W. shoulder of the peak is marked by two, parallel "ditches" each about 2'-3' deep and approximately a chain long, separated only by a few feet and both striking approximately N. & S.

These features are not unlike the earthquake rents described by McKay in the Awatere Valley, but are several miles N.W. of that line which appears to enter the sea at White Bluffs.

It is possible that the above occurrences may be slips, especially as the hill top is built of more or less incoherent gravels underlain by greywacke. On the other hand, the "trenches" are quite straight and there seems to be no reason, if the feature is due to slips, why the slipped material did not carry down the slope.

Enclosed is a snap of a canyon, at White Bluffs, which may possibly be situated on the N.E. end of the line of earthquake rents in the Awatere Valley....



Notes:

W. G. Branch, together with Dagger, was the author of a paper on the geology of the Wairau Valley.

The trenches described at Split Peak in the Vernon Hills are possible ridge rents. Their N-S strike, however, could indicate that they represent the trace of the active Vernon Fault that crosses the Vernon Hills to join with the Awatere Fault. If so, it implies recent, last century (possibly 1848, or 1855) movement on the fault.

British Admiralty

Source: British Admiralty (1878): Hydrographic map: Cook Strait, 1878. London: Hydrographic Office of the Admiralty.

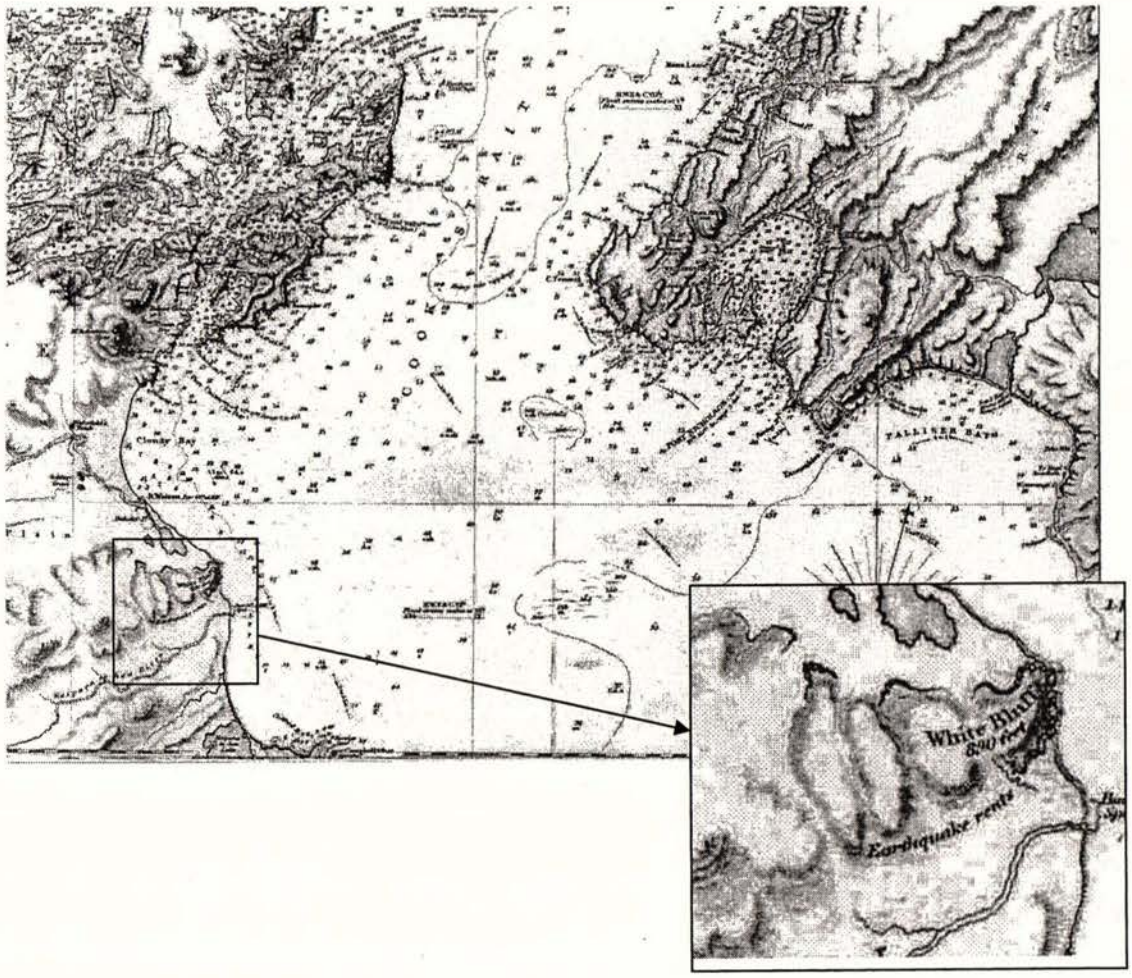
Location: Awatere Valley, Marlborough, Cook Strait

Keywords: secondary, faulting, ground damage, background.

Map shows the generalised position of "earthquake rents" (presumably those formed during the 1848 earthquakes) along the line of the north-eastern part of the Awatere Fault, Awatere Valley, Marlborough.

Notes:

The map was compiled from surveys made by the *HMS Acheron,* which also surveyed Clifford Bay and Cape Campbell in 1849 at which time the officers and crew visited Frederick Weld at Flaxbourne.



British Parliamentary papers

Source: Papers relative to the Recent Earthquake at Wellington. Documents presented to both Houses of Parliament of Her Majesty, 10th May, 1849. London: Printed by W. Clowes and Sons, Stamford Street, for Her Majesty's Stationery Office, 1849.

Location: Wellington.

Keywords: secondary, mainshock, aftershocks, building damage, casualty, background response/recovery, atmospheric effects

SCHEDULE

Despatches from Governor Grey.

Number in Series.	Date and Number.	SUBJECT.
1	13 November 1848 (94)	Encloses two Despatches from Lieutenant-Governor Eyre, No. 103, Oct. 19, 1848, No. 104, Oct. 21, 1848, containing account of recent Earthquakes at Wellington.
2	20 November 1848 (96)	Encloses further despatch, No. 105, October 29, from Lieutenant-Governor Eyre, reporting that the violence of the Earthquake at Wellington had subsided List of the principal Houses injured

PAPERS RELATIVE TO THE RECENT EARTHQUAKE AT WELLINGTON

(No. 94.) No. 1.

Copy of a DESPATCH from Governor Grey to Earl Grey.

Government House, Auckland, Nov. 13, 1848.

My Lord, (*Received April* 25, 1849.)

It is with extreme regret that I transmit for your Lordship's information copies of two Despatches, which I have received from Lieut.-Governor Eyre, detailing the great loss which has fallen upon the inhabitants of Wellington from the effects of a series of severe earthquakes.

2. Having received verbal information from various sources to a much later date than Mr. Eyre's despatches, I shall perhaps best meet your Lordship's wishes by stating generally the full effects, as far as they are yet known, which these earthquakes have produced upon the whole colony.

3. They have been felt severely throughout the whole tract of country, extending in the Northern Island from New Plymouth to Wellington. It is thought, also, that a slight shock was felt in Auckland early one morning.

4. In the Southern Islands earthquakes have been felt from Nelson to Cloudy Bay.

5. In the southern portion of this island the shocks commenced on the 16th of October; and upon the 31st of the same month, to which date my intelligence extends, shocks at Wellington were still said to be of frequent recurrence; and early in this month a few shocks were still felt at New Plymouth or Taranaki.

6. The only place at which any serious damage appears to have been inflicted by this visitation was at Wellington. There, unfortunately, three lives were lost by the falling of buildings, and I fear that a large amount of property must have been from the same cause destroyed. I am told that the total loss of property at that place is estimated at 50,000*l.*; of which loss, however, a great portion would fall upon the Colonial Government, the public buildings having been those which were principally destroyed: wooden houses and buildings, I am informed, escaped without any injury whatever. Still, however, admitting that there may be much exaggeration in the estimated amount of loss, and that a great portion of it will fall upon the Colonial Government, there can be no doubt that the loss of property which has taken place will be severely felt by the inhabitants of so young a settlement, which has already had so many difficulties to contend against. The most serious loss to Wellington, however, is the want of confidence which has been created, and the panic which has arisen, under the influence of which I understand that many families intended to abandon the place.

7. This feeling will, however, I trust, speedily subside; and in order that every encouragement and assistance may be afforded to the sufferers, which it is in the power of Government to bestow, I propose to proceed to Wellington with the least practicable delay, where your Lordship may rely upon my doing all I think you would desire to be done for the relief of the inhabitants of that place.

8. The intelligence I have received of the effects of this earthquake at Taranaki and Wanganui, quite satisfy me that up to the latest dates Wellington was the only settlement at which any injury of consequence occurred, or was likely to take place.

I have, &c.,
The Right Hon. Earl Grey, (Signed) G. Grey.
&c. &c. &c

(No. 103.) Separate. Enclosure 1 in No. 1.

Sir, Government House, Wellington, Oct. 19, 1848.

1.It is my most painful duty to inform your Excellency that a terrible calamity has overtaken this province. An earthquake has occurred, and the town of Wellington is in ruins.

2. On the morning of Monday, the 16th October, about 20 minutes to 10 a.m., the first shock occurred, and was sufficiently strong to throw down and injure most of the chimneys in the town, and to crack the walls of very many of the brick buildings.

3. Considerable loss of property was sustained by breakages in the houses, and a good deal of alarm was excited in the minds of the inhabitants.

4. During the whole of Monday, shocks and tremblings of the earth were from time to time experienced, but of a slighter nature than the first.

5. On Tuesday, the 17th October, about 4 o'clock, a.m., another smart shock was felt, and again about 8 a.m. Slighter ones continued at intervals during the day, until at 20 minutes to 4 o'clock in the afternoon, when a sudden and much more violent shock took place. By this, chimneys previously remaining up were, for the most part, thrown down. The native hospital, the gaol, many of the large brick stores, and the higher brick walls were, either very much rent or wholly thrown down. Immense destruction of property took place, and I regret to add, a melancholy loss of life. Barrack sergeant Lovell, and two of his children, were thrown down and buried by falling ruins. Upon being extricated, one of the children was found dead, and the other so seriously injured, that it died a few hours afterwards. The sergeant, himself, was much hurt, and now lies in a precarious state (now dead). During the remainder of Tuesday, and the succeeding night, slight shocks only were felt, but about 5 a.m., on Wednesday morning, a stronger one occurred, and another about 8 a.m. Minor shocks continued at intervals during the remainder of the day and evening, until the morning of Thursday, the 19th, at 10 minutes past 5 a.m., when a most violent and awful shock took place: every building was rocked to and fro in a fearful manner, and with the exception of the wooden buildings, most of the houses and stores were seriously shattered or fell in. the whole population were in the utmost consternation and alarm, and the destruction of property was immense; but most providentially, up to the present time, no further loss of life has ensued.

6. Numbers of persons are, however, ruined; many left houseless and homeless, except such temporary shelter as can be afforded by the new church, Te Aro, by the Government House (where the hospital patients and some others are taken in), and by the wooden buildings of their friends. Many persons are afraid of remaining in any of the houses at night, and retire to the bush, amongst the hills in the hope of being more secure, notwithstanding the wild and inclement weather by which the earthquake has been accompanied.

7. A blow has been struck at the prosperity, almost at the very existence of the colony, from which it will not readily recover. Terror and dismay reign everywhere; for the last four days no business of any kind has been transacted. The energies of all seemed paralysed, and during that period no one has bee able to feel for a moment that even life itself is secure.

8. As I now write (11 p.m., 19th October), tow incessant and alarming tremblings of the earth are experienced; what may be the eventual result, or when this dreadful state of suspense and anxiety may be terminated, God alone can tell, but every one seems to have a presentiment that it will end in some still more fearful catastrophe than any which has yet taken place.

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9. The sad ravages which have already occurred, and the terror which so frightful a visitation naturally produces in most men's minds will, I apprehend, drive from the colony all who can find the means of getting away. The few ships now in port waiting for moderate weather to sail are crowded to excess with colonists, abandoning the country, and many are unable to obtain passages.

10. Under this awful visitation I deemed it my duty at once to summon my Executive Council, and, with their approval, to proclaim a day of solemn and public fast, prayer, and humiliation, in order that supplication might be offered up to Almighty God, to avoid the recurrence of any similar visitation, and Friday, the 25th October, was appointed for this purpose.

11. I will not fail to communicate to your Excellency such further information and reports as it may be in my power from time to time to render.

I have, &c.,
(Signed) E. Eyre.

(No. 104) Separate. Enclosure 2 in No. 1.
Government House, Wellington, Oct 21, 1848.
Sir,

1. In continuation of my Despatch of the 19th instant, I have the honour to inform your Execllency, that between half-past eleven p.m. on the 19th, and 1 a.m. on the 21st, frequent and rather strong shocks succeeded each other in rapid succession, during which time the earth appeared to be in a state of continual agitation under foot. The shocks and the pulsation of the ground then ceased until about 5 a.m., when slight shocks again occurred, and were repeated at intervals during the whole of Friday, but no further damage was done by them. And, although shocks have been experienced occasionally up to the present time (11 a.m., Saturday, 21st October), I would hope that the worst is over, and that the convulsions of nature may gradually subside. We are not, however, yet aware of any eruption having taken place, or any vent being opened in any direction, though strong lurid lights seen in the sky in the evening, in the north and south, seem to be reflections from the light of some volcano.

2. Yesterday (Friday the 20th of October), was, in accordance with the intention given your Excellency in my last despatch, observed as a solemn fast-day, and I am happy to say that it was most reverently observed, persons of all classes and of all denominations responding in right feeling and conduct befitting such an occasion, and showing by the immense assemblages at the various religious observances of the day, that they acknowledged the hand of the Almighty, and looked to him only for safety and protection.

3. In consequence of the long continuance of the earthquake, and the uncertainty as to what may be its eventual results, I have deemed it right, under the advice of my Executive Council, to order the detention for a few days, of any vessels in harbour, which might attempt to leave it, the alarm and apprehension being so great, that if the few ships here were now to sail away, the people would consider themselves as altogether deserted, and without any means of

security left them should future shocks occur, and produce greater devastation than already exists. This order, I find, has already exercised a most beneficial influence in keeping up the spirits and confidence of the population.

4. I have also taken the precaution of shipping on board Her Majesty's ship "Fly", the greater part of the specie in the Colonial Chest, until some time as the elements appear more settled.

5. The Commissariat Department have, I believe, also done the same thing, under the instructions of the senior military officer. Persons arriving by a vessel leaving Otakou on Wednesday the 8th state that no shock had been experienced there up to the time of her sailing. I have no accounts from Wanganui or Nelson, but I fear the earthquakes must have been felt severely at both. From Queen Charlotte's Sound an open boat came over in very stormy weather for the purpose of bringing away a party of European women who were living there, and were alarmed at the convulsion going on. At Brima [Paremata] the barracks are destroyed, and the troops are living in wharés.

6. The natives have no recollection of any earthquakes at all corresponding in either degree or continuance to the one which is now visiting us.

I have, &c.
(Signed) E. EYRE.

(No. 96.) No. 2.
Copy of a DESPATCH from Governor Grey to Earl Grey
Government House, Auckland, Nov. 20, 1848

My Lord, (*Received April* 26, 1849.)
In reference to my Despatch No. 94 (Page 3), of the 13th instant, I have now the honour to enclose a despatch from the Lieutenant Governor of New Munster, dated the 30th of October, which did not reach me until the 18th instant.

Your Lordship will be glad to find from this despatch, that although slight shocks of earthquakes continued to be felt at Wellington upon the 30th of October, yet still, that public confidence was gradually returning, and that there was every reason to suppose that the greatest violence of the earthquake had subsided; the information I have received from various parts of this island, lead me to believe that no serious damage has occurred at any other place than Wellington. I intend to proceed to that settlement to-morrow, and I trust that the measures which have been already taken, and which I propose to take upon my arrival there, will soon entirely restore public confidence, and that its former state of prosperity may, under the blessing of Divine Providence, be speedily re-established.
I have, &c.,
The Right Hon. Earl Grey, (Signed) G. GREY.
&c. &c.

Enclosure 1 in No. 2. (No. 105.) Separate

Sir, Government House, Wellington Oct. 29, 1848.

1. MY Despatches No. 103 (Page 4), of the 19th October, and No. 104 (Page 4), of the 21st October, will have put your Excellency in possession of information connected with the late earthquake up to the date of the latter of those communications. I now proceed to carry on the narration up to the present time.

2. From the 21st October to the 24th tremblings of the earth and slight shocks occurred at intervals, but as these occasioned no damage, and their intensity appeared to be lessening, public confidence revived a good deal, and persons began to follow their ordinary occupations, but at about 2 P.M. on the 24th, another sudden and very violent shock took place renewing the terror and apprehension of the inhabitants. Although it caused little additional damage beyond some further breakages of glass or other fragile articles in the houses. From the 24th up to the present time tremblings of the earth and slights shocks have frequently been experienced, but the character of the motion caused by the shocks seems changed, not only is there less of a vertical motion, but it appears to be caused by a force acting at a greater distance than formerly, in fact, the shocks now experienced, seem to be little more than the continuation along the earth's surface of a vibration produced by a heavy distant concussion preceded by a loud rumbling noise much more distinctly heard, and more in advance of the shocks than was the case during the earlier and heavier shocks.

3. Such being the case, I am happy to say public confidence is rapidly reviving, and much activity prevails in clearing away the fallen buildings and putting up new ones of wood.

4. I have had a list made, showing the buildings principally damaged or destroyed, and now transmit to your Excellency a copy (Page 7).

The wooden buildings have, without exception, I believe, stood well, sustaining no further damage than the loss of their chimneys, and fortunately by far the majority of the buildings in the settlement were of wood, so that notwithstanding the many dwellings destroyed, and the immense loss of property, yet the population are all under comfortable and secure shelter, and such property as could be saved is in security and out of the weather.

5. In my Despatch No. 103, 19th October, written on the day of the occurrence of the most violent and destructive shock experienced during the whole earthquake. I described the panic which existed among the inhabitants, and the strong disposition to quit the colony which prevailed. I also intimated to your Excellency that I have given directions for the temporary detention of any vessels wishing to leave this port during the continuance of the earthquake, and this proceeding had had a beneficial result in allaying the prevailing panic. No occasion has, however, existed for enforcing a complete detention of any vessel, so many passengers, and so much cargo offered for the ship first about to quit the port, that it was the interest of the agents to detain her for some days, during which the circumstances of our position became so far modified, and so much more cheering, that I considered it unnecessary to keep up the embargo, and instead only required the captain or agent of any vessel to lodge with the Collector of Customs, for the purpose of being posted up publicly, a list of all passengers

about to leave the province forty-eight hours before a clearance could be given. A regulation of this nature became absolutely necessary in the circumstances of the Colony to prevent persons taking advantage of the occurrence of the earthquake to abscond without paying or making provision for their debts.

6. The "Subraon", for Sydney, was the first vessel ready, and on the afternoon of the 26th October she sailed from the harbour, having on board 66 passengers, men, women, and children.

7. Unfortunately her sailing was delayed to rather a late hour in the afternoon, and the pilot, in whose charge she was, attempted to take her against a strong south-easter, through Chaffer's Passage, during which, about 8 P.M., she struck within 100 yards of the shore upon missing stays. All lives were providentially saved, and the passengers landed about three-fourths of a mile from the pilot's residence, where many were accommodated for the night, whilst others obtained shelter under temporary tents, formed by sails erected on the beach.

On the 27th and 28th, the weather being moderate, a good deal of the cargo was got out and saved, but the vessel itself, a fine new barque of 500 tons, is, I fear, a complete wreck.

8. I have suspended the pilot from his office until a proper investigation can be made into the circumstances under which the "Subaron" was lost.

9. In consequence of the loss of the "Subraon", and from a hope generally entertained that the earthquake is now nearly over, I believe that many who intended to quit the colony will remain, I would hope, even, that the injury which the colony is likely to receive by the impression which the occurrence of so severe an earthquake must naturally make in England, will not be so great or so permanent as was at first anticipated.

10. Awful as the visitation was during its continuance, and calamitous as have been the results, there are yet many circumstances of consolation and encouragement in connexion with it. First, such convulsions appear to be most rare. No similar ones have taken place since the Colony was established, nor can I ascertain that the natives or others ever remember any of such violence and long continued duration. Secondly, the worst shocks have not been the first, and thus a timely warning has been given to quit brick or other dangerous buildings, and little loss of life has ensued. Thirdly, not a single wooden building has been destroyed or, as far as I am aware, even injured, and thus amidst all the alarm and apprehension which so sudden and fearful an occurrence naturally excites, places of shelter and security have existed for the whole population, and no other real injury has been sustained by a large number of the inhabitants than has been occasioned by the breakage of fragile articles in their houses. Fourthly, there is no doubt whatever that not a single brick building in the town has been really well and properly built, so that it is impossible to say how far brick buildings, if really well and substantially put up, would have withstood the violence of the shocks experienced; even as it was some one or two buildings of brick have been left, comparatively speaking, uninjured. I will, however, endeavour to collect further information, and cause proper reports to be made in reference to the whole subject, and trust I shall be able in a future and interesting details.

11. It remains for me to add, that as far as I am able to judge, from the information I have received from Taranaki, Wanganui, Nelson, Akaroa, Otakou, and the East Cape, that the earthquake has been much less felt at all those places than at Wellington; and at none has any damage of consequence been sustained. It must not, however, be forgotten, that from the absence of brick buildings no common standard of comparison exists as to the strength or power of the shocks at each place, and that therefore it is difficult to judge of the intensity with which they may have occurred at each respectively.

I have, &c.,
His Excellency the Governor-in-Chief. (Signed) E. EYRE.

RETURN OF THE PRINCIPAL HOUSES INJURED.

WELLINGTON TERRACE. – *Mr. King,* solicitor – Clay house partly faced with brick. Posts in the walls; the clay walls strengthened with slips of woods nailed across; the posts about nine inches apart. The brick facings all down, and great part of the claywork fallen out or much shattered. – *Mr. Cridland.* – Clay walls built with upright posts, same as preceding, with slips of wood nailed to the posts; the clay all thoroughly loosened. – *Captain Sharp.* – Clay, with strong posts, about two feet apart: 12-inch walls very substantially built. Slips of wood nailed to the posts; the clay completely shattered throughout. – *Mr. Bethune.* – A brick house, severely cracked in several places. – *Mr. O'Reilley.* – Clay house, very substantially built; the north half very much injured, the south half slightly. Mr. Thomas Fitzgerald superintended the building of this house; the walls very thick. – *Mr Strang.* – Clay house, faced recently with brick, completely shattered, now being cleared away for rebuilding.

TE-ARO FLAT. – *Mr. Vincent*, printer. – clay walls very substantial, being replaced with timber. – *Mr. Plimmer.* – Very strong clay walls, with posts partly faced with brick; the walls severely injured, must be replaced. – *Mr. Lowe.* – Clay walls, 15 inches; built in a most substantial manner. The gables down, and the remainder much separated. – *Mrs. Henry.* – 12-inch clay walls, severely shattered. – *Mr. Hawkins.* – Same as last; partly down. – *Mr. Foster.* – Ditto, ditto. – *Mr. Penmys.* – Brick house; two stories very much rent, and two of the sides much bulged out. – *Mr. Gordon.* – Brick house; greater part down. – *Mr. Stutfield.* – Ditto; much shattered. – *Mr. Masters.* – Substantial clay house; mostly down. – *Mudgeway.* – clay, with posts in the walls; slips of wood nailed between the posts ruined. – *Bennett.* – Same as last. – *Mr. James May.* – Substantial clay house, rent throughout. – *Ashdown.* – Clay house, with posts slightly injured. – *Mills.* – Ditto, ruined. – *Ford.* – Clay house, ruined. An inferior house. – *Gerard.* – Ditto. Much injured, and partly down.

SALTON ROW. – *Old Military Hospital.* – Completely ruined. – *Mr Quins.* – Houses all clay; ruined. – *Mr Villiers.* – Some clay and some brick, will have to be rebuilt.

DIXON STREET. – *Charles Howe.* – Frame house, brick knogged; the bricks partially displaced, and on gable partly down. – *Waters.* – Mercer's shop; clay fallen in, now rebuilding with wood. – *Stoddart.* – Brick; severely shattered and part down. – *Blyth.* – Substantial clay house, faced with brick; highly finished; a total ruin. – *Catchpole's* Steam flour-mill. Brick; thoroughly ruined.

WILLIS STREET - *Crouther,* tailor. – Brick, front down, and back down. Side walls much injured – *Wilkinson* – Clay house, severely shattered, and gables down. Several smaller houses equally injured.

MANNERS STREET. – *Wesleyan Chapel.* – Ruined and level. – *Rhode's* bonded store. – Brick; levelled. – *Hickson's* bonded and private store. – Substantial brick building; shattered to pieces. – *Allen's* commercial room. – The brick work shattered very much; part down. – *Allen's* public-house. – Frame work and brick knogged; very little damaged, if any. – *Bethune and Hunter's* store – A wooden building, severely injured from the shifting of the goods violently. – *Fitzherbert's* bonded store and private store. – In a ruinous state – *Ordnance* store – Brick house of two stories, with gables fallen outwards; the side walls very little injured. – *Loxley's* brick store – Both gables seriously injured, the side walls very little; this house is very near, and runs parallel with, the Ordnance store. – *Bank Safe.* – Brick, seriously injured in the arch.

HERBERT STREET. – *Langdon's* store. – Brick; in a ruinous state. – *Hansard's* house. – In ruins; a two story brick house well finished – *Squib.* – Strong clay house, shattered; house contiguous, brick knogged; most of the bricks fallen out.

BEACH – *Smith and Wallace's* large brick store. – The new front falling away. – *Plimmer's.* – Brick house, late Government offices; slightly cracked. – *Christian's* store. – Brick; slightly injured. – *Mr Swinbourn.* – Brick house seriously injured. *Mr. Hort.* – Brick knogged store uninjured; a two story house; substantial clay walls in rear of Mr Hort's store slightly injured. – *Armstrong,* saddler. – Brick house, not dangerously injured – *Mr. Inglis.* – Brick store, slightly injured. – *Mr. Johnston.* – Brick store; much shattered. – *Mr Young's* hotel. – Seriously shattered. – *Mr Grace.* – Brick house, shattered throughout – *Jonk.* – Brick house, front shattered. – *Alsdorf.* – Public-house, taken down. – *Stafford,* tailor. – Brick house; very little injured. – *Brandon's* office severely injured. – *Cook,* tailor. – Ditto, ditto.

THORNDON FLAT. – *Hornbrook's* store shook to pieces, and the brick house adjoining. *Dr. FitzGerald.* – Clay house; seriously injured. – *Major Richmond.* – Brick knogged house; very much loosened; ill built at first. – *New Zealand Company's Offices,* ruined. – *Clifford.* – Brick house; slightly injured – *Cooper.* – Brick, two story house at Kaiwara; seriously injured. – *Independent Chapel,* Thorndon Flat.- Seriously damaged. – *Swallow Playhouse.* - Levelled – *Methodist Chapel.* – Levelled - *Colonial Hospital.* – Ruined. – *Gaol,* Mount Cook – Ruined – *Mr. Cole's* house very seriously injured. Mr. Hort's dwelling-house, and Mr. Hickson's, on Te-Aro Flat are uninjured, except the chimneys. Mr. Hort's store on the beach is brick knogged and uninjured. Mr. Ross' dwelling-house, brick, uninjured. The above not to be accounted for from any principles in the nature of the buildings *per se.*

(Signed) WM. Miles, Sergeant of Police.

MEMORANDUM.

The foregoing are the principal buildings which have suffered injury; many others are slightly injured, and perhaps some may have more than is apparent; but the greater part of those now enumerated will have to be rebuilt. Clay buildings have suffered equally with brick ones; but it does not appear that there is so much danger to be apprehended from their falling. The clay will stick together, when in the same circumstances the bricks would crumble or fall down. That can be accounted for from the unyielding nature of a brick wall, when compared with the adhesive nature of clay material. Clay houses, built with posts, are the least dangerous of the two, as the posts will support the fabric under any circumstances; but the house is always requiring repairs. As the clay is continually separating from the wood, even those which have slips of wood across, from post to post, are very little more secure than the others, as the clay is not so adhesive, but gives way under the influence of the weather, or of the smart shocks of earthquakes, such as are frequently experienced, in this country; and plaster will always appear cracked over the posts.

The wooden buildings, even of the poorest description, have suffered no injury. The reason is obvious; for when one part yields from the shock, the part opposite must follow, and they will return in the same manner, all being tied together. For a dwelling-house, good sound wooden framing, either weather-boarded with lath-and-plaster inside or brick knogged with lath-and-plaster, would appear to be the most suitable, there being no chance of danger from them under circumstances similar to the present. For stores, strong frame-work, similar to that of the church lately erected at Te Aro, would be very suitable, not to be higher than two stories. The heavy weights only to be placed on the lower floor, with lath-and-plaster inside; the heat would not be greater than that of a brick house; the spaces between the weather-boarding and lathing being vacant. These remarks are only applicable, supposing the country should be subjected to frequent returns of the same accidents as have recently visited it. Te Aro seems to have suffered most. The same description of buildings which are on Thorndon Flat, and on the Terrace, and have suffered little or no injury, are in ruins on Te Aro. The Colonial Hospital on Thorndon Flat, is the exception. That building does not appear to have had a chance of resisting any force nearly approaching to that which was recently brought to bear against it. But that is a matter of opinion, which it may not be proper for me to venture. Every chimney in the settlement is down, or seriously injured, so much so as to require being rebuilt, except one, viz., Captain Robinson's house, at the back of Mr. Bethune's, Wellington-square.

(Signed) WM. Miles,
Serjeant of Police.

DESCRIPTION of the state of the Buildings in the town of WELLINGTON, after the Earthquakes, October, 1848.

PRESENT STATE OF THE BUILDINGS.	DESCRIPTION OF BUILDINGS.			
	Brick.	Clay.	Brick Knogging.	Wood.
Uninjured	4	..	2	..
Slightly damaged	4	2	1	..
Much damaged	19	11	1	..
In ruins	19	30		..
Total	46	43	4	..

There are no peculiarities in their construction to account for four brick houses being in an uninjured state, unless it be that they are of a square form, and all sides being equal in weight, the pressure on all the parts would, of course, be equal. Some of the brick buildings described as in ruins, are crushed to pieces. The others, though still standing, are not to be approached without danger. The houses described both as slightly and much damaged, whether clay or brick, are not considered, in most instances, as repairable; some of them are in course of being renewed with timber, as weather-boarded houses. The clay houses returned were of substantial structure, and considered by the owners as permanent buildings. Most of the other clay buildings in the town were of an older date, of slighter construction, and being more yielding escaped with little or no damage. Those have not been returned. Brick-knogged houses stand very well, if properly bonded; but there are four only of that description which are not weather-boarded.

All the wooden houses have escaped without any damage whatever; not even the glass injured. The whole of the chimneys are down, or seriously cracked.

(Signed) W.M. Miles,
Serjeant in charge of armed Police, Wellington.

LONDON: Printed by WILLIAM CLOWES and SON, Stamford Street,
For Her Majesty's Stationery Office

Source: Schedule of buildings in Wellington, and the Neighbourhood, which have been damaged by the Earthquakes in October, referred to in the accompanying Report. 1848 losses by earthquake. In: Further papers Relative to the Affairs of New Zealand: Correspondence with Governor Grey. (In continuation with papers presented by Command in August 1848, and May 1849. Presented to both Houses of Parliament by Command of her Majesty 1849. p62, et seq. London: Printed by W. Clowes and Sons, Stamford Street, for Her Majesty's Stationary Office, 1849.

Location: Wellington

Keywords: secondary, mainshock, building damage

Notes:

The following Schedule of Buildings damaged accompanies a copy of a letter written by the compilers of the Schedule, T. B. Collinson, R. Park and H St Hill. This was also published in the New Zealand Government Gazette (q.v.), but while the schedule is referred to in the Gazette, it is not published with the letter, and we have not located any other officially published version in New Zealand Government papers.

The British Parliamentary version of the Schedule differs in a number of aspects (particularly in the interpretation of surnames and place-names) from the Schedules found in Hickson papers at the Alexander Turnbull Library (included in the Hickson extracts) and in Ward (1928), not reproduced in this compilation. Ward claims to have taken his version from British Parliamentary Papers of July, 1849, while the Hickson version was probably also transcribed from the same papers, with the names of people and places corrected by Hickson from his knowledge of the Wellington community.

Ward, L. E. (1928). *Early Wellington*. Whitcombe & Tombs Ltd, Wellington, New Zealand.

Schedule of Buildings in Wellington and the neighbourhood which have been damaged by the Earthquakes in October, 1848, referred to in the accompanying Report.

Situation	Proprietor or Occupier	Nature of Building	Damage	Repairs Proposed by the Owner	Observations by the Board
Wellington Terrace	Mr. King, Solicitor	Clay house partly faced with brick; posts in the walls, the clay walls strengthened with strips of wood nailed across the posts, about 9 inches apart.	The brick facing down; the walls much shattered, part fallen down.	To be pulled down, and rebuilt of wood, by the owner.	None of these buildings are in a public thoroughfare; and the Board do not think it necessary that they should offer any observations respecting them.
	Mr. Cudland [Gridland]	One-story house, walls of clay, with posts, and slips nailed across.	Walls shattered, partly down.	Similar.	
	Capt. Sharp	One-story clay house, walls 12 inches thick, with strong posts 2 feet apart, substantially built.	The whole of the clay work much shaken	Being repaired with wood.	
	Mr. Bethune	Two-story brick house, with verandah in front.	Walls cracked	Under repair.	
	Rev. J. O'Reilly	Two-story clay house, thick walls, very well built.	One of the gables much shaken, the other slightly; parts of the side walls loosened.	Ditto	
	Mr. Stracy [Strang]	One-story clay house, faced with brick-work outside.	Brick-work fallen out, and the front walls shattered.	To repair with wood-work.	
Te Aro	Mr. Vincent	One-story house, part clay, part weather-boarded	one side wall of clay fallen out, and one of the gables also.	Rebuilt with wood.	
	Mr. Plenimus [Plimmer]	One-story clay house, with posts in the walls, well built, part faced with 4½ inch brick-work outside.	Nearly all the brickwork down, and all the walls shaken.	Not known.	As these buildings are not in a thoroughfare, and do not endanger the public safety, the Board do not think it necessary to offer any observations.
	Mr. Lowe	One-story clay house, thick walls, and well built.	Both the gables down	Ditto.	
	Mr. Hendy [Hendry]	One-story clay house, wall 12 inches thick	All the clay work disturbed	Ditto.	

Schedule of Buildings in Wellington and the neighbourhood which have been damaged by the Earthquakes in October, 1848, referred to in the accompanying Report. — *continued*

Situation	Proprietor or Occupier	Nature of Building	Damage	Repairs Proposed by the Owner	Observations
Te Aro	Mr. Hawkins	Similar	Part fallen, other parts falling	Ditto.	
	Mr. Foster	Similar	Front wall and one gable shattered; other parts loosened.	Repaired with wood-work.	
	Mr. Penny	Two-story brick house, with brick partitions, wood bonding all through at every 3 feet.	Front and back walls thrust out, and partition split.	Not known.	
	Mr. Gooder	Small two-story brick house	Completely shattered; partly down	Damages are being repaired in wood.	
	Mr. Hutfield	One-story brick house	Much shaken, wall cracked over the openings of windows, &c.	Not known.	
	Mr. Masters	One-story clay house	One side wall down other parts shaken	Repaired in wood.	
	Mr. Mudgway	One-story clay house, posts in the walls, and strips nailed across.	Greater part down	Not Known.	
	Mr. Bennett	Similar	Similar	Ditto.	
	Mr. May	One-story clay house; well built	Walls much rent	Ditto	These buildings are not in the thoroughfare.
	Mr. Ashdown	Similar	Slightly damaged	Ditto.	
	Mr. Mills	Similar	In ruins	To take it down.	
	Mr. Ford	Similar	Similar	Ditto.	
Suttor[Sutton]-Row	Mr. Gerard	Well built clay house, two-stories	One gable and part of one side wall fallen out.	Being repaired in wood.	
Ditto (Military Hospital.)		Several one-story houses of clay, detached	All shattered; parts fallen down	To re-build in wood.	
	Mr. Quin	Several clay houses one-story, small	All more or less shaken, portions fallen down; all unsafe.	Repair wood-work.	
	Mr. Villars	Several small houses, some clay, others brick.	Parts of the clay, as well as the brick walls, have fallen, and the whole been much shattered.	To repair some with wood-work, and take down others.	These buildings are not in the thoroughfare.
Dixon Street	Mr. Howe	Two-story brick house, and wood bonding	One gable down, the rest slightly shaken	To repair in wood.	
	Mr. Waters	One-story clay house	One gable down	Repaired with wood-work.	

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Schedule of Buildings in Wellington and the neighbourhood which have been damaged by the Earthquakes in October, 1848, referred to in the accompanying Report. — *continued*

Situation	Proprietor or Occupier	Nature of Building	Damage	Repairs Proposed by the Owner	Observations
	Mr. Stoddart	One-story brick house	Much shaken, one gable partly down	Ditto.	
	Mr. Blyth	Well built clay house, two stories, with brick work outside.	All the walls shattered, portions thrown down.	Being repaired in wood.	
	Mr. Catchpool	Three-story brick flour-mill	Shaken all over		Recommended to be taken down.
Willis Street	Mr. Wilkinson	Two-story clay house	Front wall fallen out	Taken down.	
	Mr. Crowther	Two-story brick house	Gables down, side walls out	Ditto.	
Manners Street		Wesleyan Chapel, large brick building	All down.	Site being cleared.	
	Mr. Rhodes	Store, two-story brick	Entirely down	Ditto.	
	Hickson, Ridgways, and Co.	Store, two-story brick, large building	Both gables down, the side walls completely shattered.	To re-build in wood.	
	Mr. Naitt	Store, wood with brick gable at S.E. end	Brick gable thrown out		Recommended that the bricks be cleared away
	Mr. Allen	Commercial room, one-story, brick	Much shattered; partly fallen down	To be boarded on the outside	Recommend to be done immediately; at present it endangers the public thoroughfare.
	Messrs. Bethune and Hunter.	Store, framing and weather-boarding	Slightly damaged from the shifting of the packages inside.	To repair.	
	Mr. Fitzherbert	Stores, one-story building, framing, brick-nogging, and brick boundary wall.	The sout-east and north-west ends thrown down, and boundary wll also.	To put a framework of wood inside, and fix iron ties outside, bolted to the framework.	Recommended to be done immediately; the thoroughfare is dangerous at present.
	Her Majesty's Ordnance.	Three-story building, 13½ inch brickwork, no wood bonding, slated roof.	Gables thrown out; north wall cracked in several places.	To be taken down	Ditto.
	Mr. Loxley	Store brick	Gables much cracked	To take down and rebuild gables in wood, put framework inside, &c., the walls, with iron ties outside.	Ditto.
	Union Bank of Australia.	Weather-boarded building, one story	The brick-work of the safe much shaken.	To repair.	
	Mr. Langdon	One-story brick, lined with wood	Ends and side down	Rebuilding of wood.	

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Schedule of Buildings in Wellington and the neighbourhood which have been damaged by the Earthquakes in October, 1848, referred to in the accompanying Report. — *continued*

Situation	Proprietor or Occupier	Nature of Building	Damage	Repairs Proposed by the Owner	Observations
	Mr. Hansard	Two-story brick	Completely shattered	Taken down.	
	Mr. Squib	One-story weatherboarded, clay inside	Similar	Taken down.	Recommend to be taken down
	Mr. Moore	A two-story house, next it bricknogged	The bricks shaken out of the framing, the wood-work only remaining.		Ditto.
The Beach	Messrs. Smith and Wallace	Store, one-story brick, no bond timbers	Front thrown forward; south-east corner opened.	To pull down the south gable, and fix 3-inch planks perpendicularly in the front 4 feet apart, tied to the inside, and three horizontal string-pieces outside.	The front endangers the street; it is therefore recommended that the repairs be done immediately.
	Mr. Plimmer	Offices, Colonial Government, two stories, brick, no bond timber.	Front thrown out and arches cracked	To put a verandah to the lower story next the street, and tie the front wall of the upper story with iron bars, and take down the parapet.	Ditto.
	Mr. Flyger	Stores, two stories, brick gables, wood front and back.	The gables started		Recommended to be taken down.
	Mr. Christian	Store, one-story, brick	Front arches cracked	To put two planks, and string-pieces outside tied to the inside, and iron bars to arch.	This building fronts the street and endangers the thoroughfare, and this repair is recommended to be immediately done.
	Mr. Swinburne	Two-story house, brick, no bond timber nor woodwork inside.	Front arches cracked	Proprietor does not propose anything	Recommended that similar planks be fixed outside, and the inside lined with wood, and iron bars to arches; in its present state it endangers the street.
	Mr. Hart	Store, one story, brick, wood lining inside	Front arches cracked and thrust out	To fix similar planks in front tied to the inside wood-work, and put iron bars to arches.	Recommended immediately for similar reasons.

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Schedule of Buildings in Wellington and the neighbourhood which have been damaged by the Earthquakes in October, 1848, referred to in the accompanying Report. — *continued*

Situation	Proprietor or Occupier	Nature of Building	Damage	Repairs Proposed by the Owner	Observations
	Mr. Armstrong	One-story house, brick, wood lining inside	Front thrust out a little	To put 4 feet 2-inch planks in the front, fixed perpendicularly to the bond timber.	Ditto.
	Mr. Inglis	Store, one story, brick	Very little damage	Repairs done.	
	Mr. Johnson	Store, one-story, brick, side walls boarded inside.	Sides thrust out; gable end and roof damaged.	To repair the gable with wood, and board the inside of the walls, and fix 3-inch planks 4 feet apart perpendicularly outside, tied to the inside wood-work.	Recommended that the repair to the gable be done at once; at present it is dangerous to the public thoroughfare.
	George Young	Two-story house, 9 inches brick, bond timbers throughout, and several wood partitions, north and south gables badly built, cracked before.	The north and south walls cracked and thrust outward; front arches cracked.	To take down the north and south walls, and fix a framework of perpendicular 3-inch planks 3 feet apart, and horizontal string pieces 5 feet apart on the outside of the front, tied to the bond timbers; to repair the damaged brickwork, board both stories inside, and put iron bars to arches.	
	Mr. Grace	A two-story brick house, small rooms, no wood bonding, slate roof.	The whole house cracked from top to bottom.	The proprietor, Mr. D. Scott, is willing to pull down the whole house, but says he is not able to do it at present.	Recommended to be done at once for the same reason.
	Mr. Tonk[s]	One-story brick house	The front and rear gables cracked	The damaged brick-work has been pulled down, and the gable boarded.	

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Schedule of Buildings in Wellington and the neighbourhood which have been damaged by the Earthquakes in October, 1848, referred to in the accompanying Report. — *continued*

Situation	Proprietor or Occupier	Nature of Building	Damage	Repairs Proposed by the Owner	Observations
	Mr. Taine	One-story brick store, lined with wood, front boarded.	The rear wall cracked over the window	Has been repaired with iron bars outside from top to bottom, and tied to the wood-work inside.	
	Mr. Abzdorf [Alzdorf]	One-story, part brick, part clay and wood	Brickwork cracked	Pulled down.	
	Mr. Sevein	Store, one-story, brick front	Thrown forward to south-east		Recommended that the brickwork be taken down and rebuilt in wood immediately, and planked as before suggested, as it endangers the street.
	Mr. Stafford	One-story, brick front	Front cracked	To pull down the parapet and fix 2-inch planks against the wall outside, perpendicularly connected with iron straps horizontally.	This building is also dangerous, and immediate attention should be given to it.
	Mr. Cook	One-story, brick house	Front and back walls thrown outward	Has been pulled down and replaced with wood-work.	
	Mr. Brandon	One-story, brick, badly built	Cracked at the east corner	To pull it down and rebuild it	Recommended to have iron ties or plank outside tied to the framing; this building also endangers the thoroughfare.
Thorndon Flat	Mr Hornbrook	Store, &c., one-story, brick and clay-wattled	The front and rear fallen out	Has been rebuilt with wood.	
	Dr. Fitzgerald	One-story, clay-wattled and weather-boarded	Cracked on all sides	To take it down.	
	Major Richmond	One-story, brick-nogged, part weather-boarded outside.	Brick-nogging cracked, and thrown out on the south and east sides.		Recommended that it be boarded inside.
	Colonial Government	Colonial hospital, two stories, hollow brick wall 14 inches, no bond timber, several partitions, a long room in the front in upper story.	The south-east gable thrown out, and front upper story also, and walls cracked on all sides.	Has been pulled down.	

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Buick, T. Lindsay.

Source: Buick, T. Lindsay (1900): *Old Marlborough.* Palmerston North, NZ: Hart and Keeling.

Location: Awatere Valley, Marlborough.

Keywords: secondary, mainshock, faulting

p. 37

... in the Awatere the 'fault' is clearly defined, sometimes and in some places more clearly than in others. For many years it was popularly supposed that this 'crack' was first opened in 1848, or 1855 ... There can, however, be but little doubt that these shocks did but re-open lines of fractures which existed long antecedent to the settlement of the country by Europeans and that their displacements were trivial compared with the movements of former times.[#]

p.338

Mr. Gouland's neighbour on the Opawa River was Mr. Budge, who, about the year 1848, came down from Nelson to conduct the survey of the plains after the land troubles had been settled. Mr. Budge and his family lived on what is known as Budge's Island, upon which he kept a flock of sheep until its subsidence after the great January earthquake of 1855* caused the land to become so sodden that he was compelled to leave it ...

*The first shock of this earthquake occurred about one o'clock in the morning, and was so severe that it demolished all the mud *whares* in the district, and for three weeks afterwards the surface of the ground was in a state of constant movement.

Notes:

Note the similarity of the wording of the # extract to the Hector entry (q.v.).]

Budge surveyed the Wairau and lower part of the Awatere valleys in 1847 and his map "Plan of the Plain and Valley of the Wairau River with the Valleys of the Kaituna and Waitohi" dated 19 March 1847, was published by the New Zealand Company in 1848. Buick has confused the 1855 and 1848 earthquakes. The first shock of the 1848 earthquakes occurred at 1.40 a.m on 16th October (as implied by the footnote); whereas the 1855 earthquake occurred at ~9.15 p.m. on January 23rd. According to C. A. McDonald (*Pages from the Past. Some Chapters in the History of Marlborough.* 1933. H. Duckworth (E.H.Penny & Co.), Blenheim, New Zealand), William Budge refers in a letter to the Nelson Superintendent (letter footnoted by McDonald as *Nelson Papers: 34*; Oct. 29, but not located) to "the subsidence of the whole district at the time of the last severe earthquake to the extent of at least eighteen inches [0.5m]". However, the date of the "last severe earthquake' is not stated.

Carter, Charles Rooking

Source: Carter, C. R. (1849): Defective construction of the houses at Wellington. Letter to Editor. *In: The New Zealand Journal* (published in London), May 19, 1849.

Location: Wellington, Nelson.

Keywords: secondary, background, building damage, response/recovery

Sir, - As I notice from the latest despatch of the New Zealand Company's Agent, Mr. Fox, that much of the damage done at Wellington, by the late earthquake, (or rather, earth tremor,

for it is unworthy of the name of earthquake,) resulted from badly constructed buildings, perhaps you will permit one daily engaged in the art of building, in all its branches, to offer a few observations on those principles of construction best calculated to resist the effects of that oscillatory, undulating, or wave-like motion of the earth, which occurred at Wellington. Want of time prevents me from entering into the subject in a complete manner, but thinking the few suggestions I have to give might render some service, I give them with pleasure. The two principal things in building, which contribute most to stability, are good material, and good workmanship. Now after a careful examination of facts, I have no hesitation in saying, that the greatest part of the damage sustained by the buildings in Wellington occurred from the discreditable and very inferior description of the material used in their construction. A preparation of mud mixed with an exceedingly small portion of lime, in the proportion of "a bushel of lime to two barrowsfull of a substitute for sand," was used with bad bricks in constructing the dwellings of Wellington. Chimneys constructed of English bricks and cement, withstood the shock. At Nelson the damage was a mere trifle; and, as the most part of the lime used at Wellington is brought from Nelson, we may infer that it is cheaper at Nelson, and therefore used in greater proportion than at Wellington, which may account for the buildings at Nelson standing the shock so well. Good mortar in buildings, is of the utmost importance. Our old castles, though roughly constructed, often of unsquared stones, mere rubble-stone walls, yet such is the strength of the mortar used, that wind, rain, and time, make an almost imperceptible progress in their destruction. In the over-hanging masses the principle of adhesion seems to rebel against the laws of gravitation.

Good mortar binds and holds all the different portions of a house together, and it is this binding together that enables a dwelling to withstand an ordinary shock of an earthquake; for one part cannot fall without the other. Buildings in the city of Quito, in South America, must be constructed on this principle, for says Humboldt in his Cosmos, "In the city of Quito, which stands at the foot of an active volcano – the Rucu-Pinchincha, 8,950 feet above the level of the sea, and boasts of beautiful cupolas, lofty fanes, and massive houses several stories high, I have frequently been surprised at the violence of the earthquakes by night, which nevertheless, very rarely occasion rents in the walls; whilst in the plains [of] Peru, apparently much weaker oscillations injure lowly built houses of cane."

In accordance with the above, I would suggest to our friends in Wellington, to lay the foundations of their houses two or three feet below the natural surface of the ground on a concrete footing, and if it is to be a building wholly constructed of bricks, let the mortar be good, which will be the case if mixed in the proportion of one bushel of unslaked lime to one bushel of sharp sand; or even one bushel of lime to two of sand will not make bad mortar; the lime should be stone lime, shell lime and chalk lime are of an inferior quality. The stone lime that slakes quickest is the best; if it be scarce in the neighbourhood of Wellington, it is the duty of the authorities to make a search for some. Sand should be washed clear of earthy or clayey particles. I should think it may be found in abundance in the beds of the rivers. Experience has proved, in England, that sea sand, after it has been dried in the open air during

the summer is equal, if not superior, to land sand; and when mixed with lime and coal ashes makes most excellent mortar. The bricks should be of good marl and dried in the sun, and then well burnt.

When the brick work is three feet in height, from the foundation, and is fourteen or eighteen inches thick, lay three pieces of hoop iron on its horizontal top, and at half the length of the wall, and each corner; take out of the surface of the wall, a brick, or two; and wrap each piece of hoop iron once round one brick, then replace the bricks level with the top of the wall, and carry up the wall three or four feet more; and then again adopt the same plan, and again, till the wall is the height required, and then the brickwork will be compact and firm. To strengthen it in height, iron hooping should be worked in diagonally; and if the first floor of joists are well spiked to the bond timber, and the ceiling joists to the wall plate, a degree of stability will be insured capable of withstanding the shock of an ordinary earthquake.

This much for brick buildings; but as timber from its cheapness in New Zealand and from being easily worked, will always enter largely into the construction of buildings there, I shall devote a few remarks to buildings principally constructed of wood; though the use of timber, from its liability to speedy decay, and to take fire, ought to be cha asmueded vo [sic; as much avoided as] possible.

For a dwelling the greatest part of which is to be built of timber, a brick foundation, and brick chimneys are essential, if not absolutely necessary; on this foundation, just above the level of the ground, wood-bond of a durable nature should be placed, which should be dovetailed together at the corners; then upright pieces of quarterns, four and a half inches by four inches, should be morticed into this bond, and kept, say, fourteen inches apart; the head, or tops of these quarterns should again be morticed in the bond of the second-floor, if any, or the wall plate, to carry the roof, and the interval between them filled in with a brick in width; care being taken to brace the quarterns with pieces of wood, at about every two feet in height, the ground floor joists, and ceiling joists, to be well spiked to the bond. The whole of the outside and inside of the dwelling should be plastered. The outside, if rough casted, would give the house the appearance of not being mostly built of wood. The method of rough casting is simple. Rough cast is a preparation thus made: a quantity of pure slaked lime is mixed with a quantity of sharp rough sand with water, and when in a liquid state, cast or dashed against the wall; directly the second coat of plaster is laid on, and while it is in a damp and soft state.

These hastily penned remarks are not altogether intended for the instruction of the builders and workmen of Wellington; they, I should say, know their business as well as many in London, but to call the attention of the public of that town, and the local government, to the necessity of making some local building act as a guide to workmen, builders, and architects, to which they must adhere.

The effect of the earthquake in New Zealand has been to alarm the inhabitants, and damage their property, a serious evil, but capable of being repaired. Those who are in New Zealand,

and those who are going there, have no more to fear than people of other countries, all countries are liable to those convulsions of nature, and no one can say what part will be exempt from them, or what part will be visited by them. Their origin dates from the creation of the world; their source lies deeply buried in the bowels of the earth, and when or where they will convulse, shake or upheave the crust of the globe, is a mystery to all men. The damage in Wellington has been trifling as compared to similar visitations in other countries; for in 1693, in Sicily, the city of Catania, and 140 towns or villages were destroyed, and 100,000 persons perished.

England is subject to them. In 1816 a smart shock rent the spire of the town of Malvern, in Inverness, and from the year 1048 to 1800, a period of 752 years, no less than forty-five earthquakes were recorded. So late as 1839 an earthquake was felt in the country town of Lancaster, which shattered chimneys, and alarmed the inhabitants. With these remarks, I conclude, and trust they will be received in the same good feeling as they are given, by one feeling a great interest in the welfare of New Zealand. – I am, Sir, yours, etc.

27, Vincent Square, London
C. R. Carter

Chambers' Edinburgh Journal (periodical)
Source: Chambers' Edinburgh Journal (1849): Article "The earthquake in New Zealand", Edinburgh, Scotland: William Chambers.
Location: Wellington, Marlborough, East Cape, Bank Peninsula, New Plymouth, Cook Strait, Otago
Keywords: primary, mainshock, aftershocks, atmospheric effects, building damage, response/recovery

p.188-190
Of the three islands which the Dutch discoverer called after a portion of his own country, because of a fancied resemblance, the middle one is of a rugged and Alpine character, having summits which cleave the clouds at a height of 14,000 feet, and which are buried for two thirds of their elevation in permanent snow and glaciers. Nor is the northern and more level island bereft of towering altitudes, especially the southern portions of it. The whole country is more or less volcanic. On the eastern and western coasts of the whole of New Zealand, but more especially in the North Island, active volcanoes abound, but not sufficiently it would seem, to give vent to the igneous forces of the under-earth, which often occasion earthquakes. Across the centre of the North Island is a chain of volcanic disturbance in constant activity. It commences at Tongariro, a conical mountain about 10,000 feet high, constantly emitting steam and smoke. From this eminence the chain extends along a line of lakes, hot-springs, steam-jets, and fissures, to the Bay of Plenty, where it is terminated by another volcano called White Island, the crater of which is near the water's edge. The temperatures of some of the hot-springs, even at the surface, is [sic] 216 [Farenheit] degrees, and there are mud jets at

boiling point. Underground noises are continually heard, new openings are frequently made, and land slips are not uncommon.

With such fiery activity in the lower regions of New Zealand, earthquakes are of constant recurrence; but, so far as can be judged from native accounts, and from the experience of South America, they are only destructive about three times in a century, when they are extremely violent. From what we can learn, no serious terrestrial disturbance took place from the first settlement of the colony till the year 1840, and in that year, we are informed by an English settler, there occurred one sharp shock, which created more alarm than damage, for it only razed a few clay chimneys. 'Since I have been here,' says the same gentleman. 'I have noted from twelve to twenty shocks every year; but they were too trifling to do damage or to create alarm. Once only – on the 4th and 5th December 1846 – there was an unusual number; namely, eight between five o'clock in the afternoon and nine the next morning, and some were of considerable force.' Up to this time, use had so familiarised the settlers to these earthly tremblings, that they scarcely heeded them.

At the end of last year, however, the people of New Zealand had occasion for more serious alarm than usual: in October an earthquake occurred that was manifestly one of the three which physical geographers had promised them per century. It lasted during five weeks, and some of the shocks would have reduced half London to ruins. As it was, it occasioned a loss of property to the amount of £15,000, and the sacrifice of three human lives. Although an announcement of the catastrophe reached this country a few months since, full and satisfactory accounts of it have only recently been forthcoming in the official despatches from the colony, in the newspapers, and from other sources. Details of such phenomena are always interesting, as much to the scientific as to the popular reader. This earthquake is the more so, as it is the latest geological catastrophe with which this earth has been visited.

A correspondent of the 'Westminster Review' publishes in its past number his journal – kept at Karori, a short distance from Wellington – in which a graphic account is given of his experiences of the commencement of the event, which took place on Monday, 16th October 1848:- 'At twenty minutes before two this morning,' he writes, 'we were awakened by the shock of an earthquake, of greater force and duration than any we have hitherto felt in the colony. It was, moreover, the first of a series of shocks which succeeded each other at short intervals during the morning and the day. The house (fortunately of wood) rocked violently; the bells were set in motion; and clocks stopped. For about three-quarters of a minute the shocks were so strong, that it was with difficulty I kept my legs. It continued with some force for two or three minutes, and the whole vibration lasted ten minutes. For one hour the shocks scarcely ceased for a minute; during the whole morning until between six and seven o'clock, the intervals were not long, and the tremulous motion of the earth was continuous, and nearly incessant. We feared for our chimneys, but they did not fall. They were, however, so much injured, that, to prevent accidents, I had them taken down. The wind was south-east to north-

west during the night, blowing a fierce gale, with very heavy rain. I went downstairs to look at the barometer immediately after the first shock: at nine on the previous night the mercury stood at 29 inches [our house is 500 feet above the harbour]; it had risen to 29.04. In the morning it had subsided to 29.02 – a very significant [sic; "*in*significant" in original article] variation.'

On the day after, our journalist transferred the scene of his observations to Wellington. Under date Tuesday, October 17, he says – 'The shocks continued all day at varying intervals. At twenty minutes before four a shock took place of greater force than the first. I was at Government House: the house shook, jerked, and then vibrated so as to shake all loose articles to the ground. I found it necessary to steady myself on my legs. There was first a short shock of four or five seconds' duration, and of moderate force; then came a loud sound from the northward and eastward, and then the strong shock. The French windows burst their fastenings, and flew outwards – the chimney-piece was cleared of its ornaments – the bottles flew from the table. Its extreme force continued about a minute – perhaps rather less. Our carpenter, who was securing one of our chimneys at Karori, afterwards told me that the tremulous motion of the earth did not cease for eighteen minutes. Loud exclamations along the whole line of the beach indicated the wreck that was going on, and the general alarm that this severe shock occasioned. I had business at my chambers at four. On reaching the court-house, I found the short stout chimney had literally fallen down itself: it could not fall outward, being supported on one side by my room, and on the other by that of the Registrar. I next visited the Colonial Hospital – a well built brick building, only lately finished: it was not down, because the walls and roof were held up by strong bond timbers; but the brickwork was split and rent, and starred in all directions, so as to make it untenable.

On Wednesday there was an unusually high tide; and although the tides were at neap, the water flooded the lower parts of some of the houses. But it was at Te Aro (the business part of Wellington, at the head of Lambton Harbour) that the greatest force of the earthquake seemed to have expended itself. All the large merchants' stores, the ordnance store, the Methodists' chapel, and a great number of brick buildings, were rent to pieces; nor was there a single chimney left standing in the town. The ordnance store buried in its full barrack-master Lovell and his two children. His little daughter, eight years of age, was taken out dead; and his son, four years old, died the same night. The father was taken to the military hospital much injured, and expired on the Friday following.

On Thursday, October 19, the journalist, still writing at Karori, says – 'Precisely at five this morning we had a sharp shock, stronger than either of the two already noted. The extreme force of the shock lasted rather less than a minute; there was considerable motion for three and a-half minutes; and the vibration lasted eight minutes from the commencement of the shock. It has done us more damage than all the others together. It has split the solid bed of brickwork which forms the lower part of our oven, completed the destruction of the other

chimneys, torn the plaster of our lower rooms to pieces (the upper are lined with wood), and broken a great many loose articles. Our windows (French casements) flew open. After this, shock followed shock in quick succession all day and night.

'In the evening, until about half-past nine, the sky to the south and south-west presented a remarkably lurid appearance; but I do not think it needs an eruption of a volcano to account for it. In very angry skies, during gales of wind at sea, I have seen something of the kind. If the state of the atmosphere be such as to increase refraction, the sun's light may have some effect long after sunset (say two and a-half or three hours in this case), and falling on very dense clouds, would produce a very angry appearance.

'Friday, 20th. – The shocks have continued in quick succession all night. They have, I think, rather diminished both in force and frequency during the day.

'The Te Aro end of the town is a wreck; Rhode's large brick store is down to the ground; the front of the Methodists' chapel is out; Ridgeway's, the Ordnance, and Fitzherbert's, all extensive buildings, are complete ruins: even the low wall round Fitzherbert's yard is down. There is considerable loss of property within. In one respect the last shock has done good: it has thrown down many walls that were in a very dangerous condition. There is naturally a good deal of alarm in the town owing to the continuance of the disturbance. Some people are encamping on the hills, under the impression that they are safer. I do not find anything in the result of the shocks to justify this. All wooden buildings have hitherto been safe, and much of the damage to brick buildings is owing to the miserable manner in which they are built. Both lime and bond-timber have been far too scantily used.'

On Saturday, Sunday, and Monday, the weather was extremely fine, but the shocks continued. They were not violent, lasting only a few seconds, and were rather heard than felt. On Monday they recurred every half hour. At two o'clock p.m. on Tuesday, 24th October, there was a shock which did some damage in Wellington, destroying the new plaster of Government House, which had stood the other shocks. A gentleman standing on a lawn felt himself 'jerked up.' This shock was followed by several others – short, but strong – till evening. After the first and severest, Dr Pendergast counted thirty shocks up to four o'clock; and from that time till eight o'clock the next (Wednesday) morning, 'there must have been,' says a statistical gentleman, who appears to have been kept awake by them, 'at least one hundred and fifty shocks.' In the morning, a chasm was opened on some newly-dug ground four yards long.

Up to the middle of November the earthquake continued in slight but oft-repeated shocks. Taking the whole of them during the five weeks, only four occurred of sufficient force and duration to do damage, though at times as many as fifteen were counted in an hour.
Among other curious occurrence to which the phenomenon gave rise, we may mention, as illustrative of the nature for the motion of some of the shocks, that in a store-room at

Alzdorf's Wellington Tavern, a large number of stout short bottles of anchovies were ranged closely together on the floor, and occupying about a square yard. At about four feet distance, and south from them, was a cask of beer (twelve or eighteen gallons, I forget which) half full. This cask was jerked up, and deposited on the top of the anchovy-bottles, without knocking down or breaking one. The motion evidently moves along a line, and at the same time undulates so as to produce this upward motion. Any one who has been in the habit of swimming in the sea during a considerable swell, must have felt something of this: the wave comes on, and moves the swimmer's body forward, but not so much as it moves upwards when under the full influence of the wave.

These upheaving tendencies of the earthquake are corroborated by a curious note in the New Zealand 'Spectator' of October 28, 1848:- 'Owing to the confusion into which the types of this office were thrown by the earthquake of last Thursday, together with the subsequent excitement which prevailed, it was found impossible to publish the "Spectator," as usual, on Saturday last. By a great effort, however, we have succeeded in bringing out the present number at our usual time of publication.'

Some persons felt a kind of meeting of shocks proceeding from opposite directions, accompanied by a sort of grinding sound. During one of these, it is mentioned that some milk in pans acquired a circular motion so rapid, that it made itself into cream, which swam about in the centre.

Wellington was manifestly the centre to which this earthquake converged, standing as it does nearly in the middle of the country, at the southern extremity of the northernmost of the islands. Immediately across Cook's Straits at Cloudy Bay the catastrophe was so severely felt on Monday 16th and Tuesday 17th of October, that some whalers brought their families over to Wellington in an open boat, at considerable risk, during a strong south-east gale. Farther away, at Otago, near to Stewart's Island, and under the highest ridges in this varied territory, the earthquake was scarcely felt; and in proportion as the shocks reached towards North Cape, their intensity decreased. 'The action of the earthquake,' says the 'Government Gazette,' 'appears to have extended from about the latitude of Bank's Peninsula to that of New Plymouth; its greatest force having been in Cook's Strait, and in a north-west and south-east direction from thence.'

The alarm occasioned by this phenomenon appears to have been trifling, after the first feelings of surprise and dread had subsided. A large vessel sailing at the very moment when the alarm was greatest for a port which is usually the resort of any who leave New Zealand, only about forty souls, including children, were willing to take advantage of the opportunity; and the vessel having got ashore in going away, the passengers re-landed, and returned to their homes. The governor, in his despatch of 31st October, declares that 'the danger of a voyage by sea is in fact greater than any that we have been subjected to; and probably every

one who travels one hundred miles on a railway, incurs a greater risk than he would do by living a life in New Zealand.' Earthquakes, therefore, are nothing to people who are used to them.

Still, their effects are to be provided against, although such a notion as their acting as a deterrent to intending emigrants can never be seriously entertained. Subterraneous volcanic action being the normal state of the country, whatever is built upon it should be firmly planted. The description of building recommended by the governor, both as being better able to withstand future shocks, and as more secure from fire, is a strong wooden frame upon a brick foundation, filled in which brick 'nogging' laid in mortar, and covered outside with laths and plaster, and board and plaster inside.

Notes:

Most of this extract is taken from the *Westminster Review* article supplied by Judge H. S. Chapman.

Chapman, Henry Samuel

Source: Chapman, H. S. (1848): Letters, various dates. *In:* Letters written between 1848-1849 by H. S. Chapman, Homewood, Karori, to his father H. Chapman, 2 Tillotson Place, Waterloo Bridge, London. qMS-0419, Alexander Turnbull Library, NLNZ.

Location: Wellington, Wanganui, Marlborough, Nelson, Awatere Valley, Wairau Valley, Marlborough Sounds

Keywords: primary, mainshock, aftershocks, building damage, casualty, response/recovery, atmospheric effects

Letter: October 18, 1848

We have been visited by a succession of Earthquakes of a severe and alarming character commencing at 20 minutes before 2 on Monday morning and still going on at intervals of about an hour. Every brick building in the town is either destroyed or injured and all or nearly all the wooden buildings have lost their chimneys. One child was killed by the falling of a gable and the father much injured. The destruction of property is very considerable. The women and children were last night wailing about the beach and all feel uncertainty as to the future and even where this will end.

Generally our earthquakes have lasted only about half a minute or even less. These I have often described but the first of these which occurred at 20 m. before 2 in the night between Sunday and Monday did not cease its vibrations for 10 minutes and was very strong for about 2 minutes. The house rocked very violently. My first impulse was to gather up the younger children rouse Harry and rush out but a moment's thought produced a conviction that nothing would go but the chimneys and they were not in a position to hurt anyone. For an hour the vibration was excessive – every few minutes increasing to a shock. By 6 in the morning I should think about 100 shocks must have occurred but they seemed to diminish in frequency and in force. From Monday morning at 8 to Tuesday at the same hour we noted 17 shocks but

some may have occurred while we slept and some slight ones were not observed while we were out of doors. The first shock of Monday morning shook down the chimneys of our old house and cracked our own so that I thought it prudent to have the upper part taken down. Many chimneys in town were thrown down and others injured but the most serious shock and that which did the most damage occurred at 20 m. before 4 yesterday afternoon. I was taking lunch at the Lieut. Governors. A loud sound warned us of a strong shock – the sound was immediately followed by the violent agitation of the house. The windows (on the French plan) burst their fastenings and flew open. The bottles flew from the table – books from a side table and two valuable chronometers on the mantle shelf were thrown down. I picked them up and one had stopped. The Lieut. Governor less accustomed to earthquakes than myself rushed out of the house and called me to follow. When I went out all the servants had assembled alarmed on the lawn. The vibration of the house had not ceased and the cries along the beach warned us that some serious damage had been sustained. I had an appointment at my Chambers where I found the Court House Chimney though sustained between my room and the Registrar's literally fell down itself. While there – the people with their spy-glasses discovered that the several brick stores and the Methodist Chapel at the Te Aro or South end were partially down. I also heard that the Colonial Hospital was much injured. I went there and found that it had only been kept from falling by the bond-timber as it is technically called – was yet rent and split and stained [strained] in all directions so as to make it untenable. The same is the case with a brick building – used as a barrack at the North end of the Town.

One family – that of the Barrack Master Sergeant is much injured and one of the children killed. This is the only personal injury I have heard of. (a sharpish shock now at 1/4 p 9 a.m. – so it is not yet over. There was one just before I began this letter).

The shock of yesterday afternoon did not do us any further injury. With some alterations in arrangements, and rebuilding the upper parts of my chimneys, £10 or £12 pounds will repair all our damage. The Carpenter employed to secure the standing part of the chimneys timed the earthquake of yesterday and found that the vibration lasted 18 minutes. We must have had 30 shocks in the last 24 hours.

I got up at the first shock to examine the barometer – but it showed nothing. We had had 48 hours gale from S. E. with heavy rain and the barometer had stood at and about 29 – low for a S. E. wind: between 9 on Sunday night and 2 in the morning it had risen to 29.04 – at 9 the next morning it was 29.02. This is next to nothing. The day had been very cold and the Thermometer was 42°.

All other Earthquakes have happened during calms or nearly so. On Sunday night we had a furious gale. Monday afternoon was calm yesterday a moderate breeze and to-day a strong wind. I find Earthquakes have occurred indifferently with N. W. and S. E. winds.

The water pools were violently agitated but I did not think to look at the sea during a shock. The large trees shook violently. All wooden houses appear to be safe.

You may well imagine that this event has greatly agitated the public mind. To live for 3 nights and two days with an Earthquake now and then and some of them so strong as to make it certain a little more strength would be destructive of every thing above ground is unpleasant enough; but this is not so bad as the state of uncertainty – not merely as to future Earthquakes, but as to the state of our dwellings at the next minute. At times the tremulousness seems to be incessant – now and then increasing to a smart shock. I fear it will knock up the settlement of Canterbury.

Our house is so strongly built that it has not started a seam anywhere. We feel no alarm about it or ourselves. Moreover I think we are a little to the Westward of the line of disturbance – which is from the Hutt to Te Aro. See map of Harbour.
With all our love. I am, My dear Father, Your affec. Son, H. S. Chapman.

Letter: October 26, 1848
Yesterday week I wrote to you, giving an account of a succession of shocks of Earthquake – two of them of a very destructive nature: they have continued ever since at the rate of 50 to 150 or more shocks per diem ever since. On Thursday morning at 5 a.m. occurred the sharpest shock we have had. Its extreme force lasted 45 seconds – it was pretty strong for 3 1/2 minutes and it did not wholly cease for 8 minutes. It completed the destruction – commenced by the other two. Not a brick building in the place remains whole, scarcely a chimney has escaped and the town looks like a wreck. Moreover the interior destruction of glass crockery etc. is very great. My chimneys are all destroyed storeroom breakages considerable and the plaster of my two sitting rooms demolished. It will take £40 or £50 to restore my damages, but this is a trifle to what many have suffered. Besides the heavy shocks others of a weaker kind have followed each other in quick succession. They were accompanied or preceded by a loud rumbling noise generally from N.N.E. or N.E. and a few from other directions. The day before yesterday we had a great number of shocks (at least 150) some of them very sharp. One in the Evening had a rotary motion. The milk in the pans revolved and collected the Cream in a sort of volute in the centre. In some houses large pieces of furniture were cast into the centre of the room, and smaller articles thrown from tables. We did not suffer much in that way – only Viner's abridgement in 30 Vols. came tumbling on to the faces and limbs of our dismayed maids whom I had placed in my dressing room that night, for safety. It will be very long before the Colony recovers from the effects – I do not mean as to property but as to the reputation of the Colony in England.

It was reported that Tongariro had burst out but we hear nothing in confirmation and "Cosmos" tells us that Earthquakes <u>may</u> happen without the presence of a volcano.

Look now at the map of N.Z. – From Tongariro N. E. to White Island in the Bay of Plenty is a chain of volcanic disturbance – Bidwill "Ramble in N.Z.", and Dieffenbach's Vol. 2 describe Tongariro, and I have described White Island in one of my early letters. Between these two extremes are, Warm Springs – a Warm Lake, Mud Volcanoes, Steam fissures and other active volcanic phenomena. Some lurid appearances have been seen to the Northward and Eastward,

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and it is conjectured that Tongariro may have become active, but travellers from Wanganui 100 miles nearer to Tongariro than this place and where the said mountain is seen, report that they did not see any indications of unusual activity. I send you a paper with an account of the disturbance which is tolerably correct. I intended to have sent you a copy of my daily notes, but I have preferred sending it to Hickson who may perhaps print it in the Westminster.

From the state of the Barometer, thermometer force and direction of Winds, rain or fine weather etc. no inferences can be drawn for during the last 12 days we have had every possible variety without any apparent effect on the Earthquakes. We have had certainly more than 1000 distinct shocks and in the absence of shocks the earth has been in a constant state of tremulousness. The only shocks of very great strength were those of Monday at 20 m. to 2 a.m. – Tuesday at 20 m. to 4 p.m. – Thursday at 5 a.m. and Tuesday (24th Inst.) at 2 p.m. all of which did damage. Yesterday the shocks were very slight and it is hoped they are over.

The shocks have been felt at Wanganui and on the coast between Wellington and Wanganui at Cloudy Bay and Queen Charlotte's Sound on the other side of the Straits and at Nelson but they had not been felt at Otago up to Wednesday the 18th. From Auckland and other places we have, as yet, no intelligence.
There is no doubt but that this event will prevent colonisation for some time, and in all probability the Company will make it an excuse for closing their career – unless indeed they should have given up before the news shall have reached them.

Many people are greatly alarmed and about 60 will leave by this ship. Governor Eyre is much frightened and his forebodings and anticipations are gloomy but unscientific. He thinks a volcano must burst out at or near Wellington. In spite of this however he has behaved very kindly to those who have suffered. On Friday he proclaimed a day of fasting and prayer. His preamble set out that "whereas the Almighty had visited us with this calamity." Now it is we who came to this seat of disturbance. No doubt this place has been the locality of Earthquakes for a long period of time – perhaps for centuries. Now if we choose to intrude upon this established seat of Earthquakes with what reason can we pray that the arrangements of nature be altered for so long as we think fit to remain. Volcanoes and Earthquakes play an important part in rendering the Earth's surface fit for the habitation of the whole human race – if I choose to seat my booby-bottom upon a crater with what grace can I say – Cease oh God! to do this great benefit to the whole human race so long as this insignificant fraction of people choose to be so seated. However, I believe he means well – the common apology for boobyism.

Kate has displayed her usual calmness and self-possession. Had you seen her on Thursday morning cleaning up in the store room and packing china etc. in small boxes, you would have fancied she was getting ready for a pleasant Brighton trip – or some such – though the house was shaken every 5 minutes by a shock....

I am, My Dear Father, Your Affec. Son, H. S. Chapman.

The shocks still continue and I think may continue for some time. …
Slight shocks still occur almost daily, sometimes one sometimes two but none of force sufficient to alarm the most timid.

Letter: November 20, 1848

I intend to send you herewith a paper with Eyre's Earthquake despatch to the Governor in Chief. It is in all respects a most exaggerated account so much so as to be absolutely untrue. He describes his own state of alarm and ascribes it to "everybody": very few but the thoughtless were free from some anxiety especially for their children, but a large proportion of the better class kept themselves free from fear. He says the town is a ruin: this is also a great exaggeration. In short the despatch is more mischievous than the Earthquake. Grey published it and came down here. The Auckland people raised a subscription, which will I hope and believe [be] civilly returned. I suspect Grey will show no mercy in his despatch to his deputy. I have made a rough estimate of the losses which I calculate as follows :

Chimneys	1500
Clay houses	1000
Small brick Do.	3000
6 larger houses and Inns	2400
Merchants stores and Dissenters Chapels	3500
	£11,400
Breakages	2,000
	£13,400
Government Buildings	3,000

The Engineer's estimate is 15,000 pounds but I believe it does not include the breakages inside. This is the town only. Add for Karori £200 – Porirua road £400 – Hutt £600, and we get a total under £18,000 about £12,000 is very equally distributed according to the losers means: i.e. the larger the house the greater damage. If you purchase the Parliamentary blue books about twice a year you will get all these accounts with the two Governors despatches.

When you write to Aunt Fanny tell her that her friend George Page is married at Auckland to one of the daughters of Major General Pitt. (A sharpish shock now going on – one about an hour since. Three shocks between 1.30 and 1 h. 45 m. one of them the sharpest we have had for some weeks. It made our bells ring: so you see they are not quite over). I am not acquainted with the young ladies; but the old father is a fine gentlemanly old man in appearance something like old Constable only taller. He got the Influenza in Sydney which has settled into Bronchitis and it is feared it will shorten his days. As you are aware generals are all old men now.

You acknowledge my account of my trip to the Wairarapa in Nov. 1847 – I have just made a short excursion to Otaki 50 miles up the Coast. The Party consisted of Colonel Gold who commands the 65th – Dr. Prendergast the Surgeon of that Corps and myself. Instead of encumbering ourselves with three men to carry our baggage and attend us, I took the Donkey and a pair of Paniers and Colonel Gold provided a steady soldier to drive Miss Jenny....

... got ferried over to the Barracks [at Plimmerton] at the point where we lunched. Here we saw traces of the Earthquake. The stone of the brick barrack is a good deal cracked so as to be untenable and the troops are living in "wares" of temporary houses for themselves.

5 Dec. The shocks continue daily but they are slight, Now and then we have a rather stronger shock. This morning at 8 we heard a loud report from the North East which rumbled towards us but when it reached the house its force seemed to be expended, and though the loud rumbling and grating sound continued the motion was slight.

Letter: 12 January 1849

Strange to say the slight shocks still continue at the rate of from one to five in the 24 hours. In all December there were only five days on which we did not notice any shocks and even on those days especially during the night shocks may have occurred which we did not notice. This month they have occurred every day hitherto and I think of rather greater strength than those of December. Still as I have before stated out of perhaps more than 2000 shocks in all only four and perhaps even only three were of a destructive character but are quite enough for destruction as Lisbon can testify and I am disposed to think that in these numerous slight shocks there is safety.

Letter: January 21, 1849

Earthquakes – After the 11th we had four days without any shocks that we were aware of. On the 16th a slight shock was felt. On the 19th four shocks in the day; on the 20th 3 or 4 slight shocks at night. These are however nothing.

Letter: February 14, 1849

This morning at 20 min. past 2, we had a very sharp shock which lasted about 25 or 30 seconds. I think it was sharper than any we have had since October. During this month we have had continual shocks on 10 days out of 24: but others may have occurred which escaped our notice.

Letter: May 4, 1849

Yesterday we had a very sharp shock at 1 1/4 p.m. another more moderate at 1 a.m. The first stopped the French clock and set all the bells ringing. It is now almost 7 months since they commenced.

Letter: 3 October, 1849

The Earthquakes are now pretty well over though we felt a slight shock and heard a rumble yesterday. Although we have had no one damaging shock since the grand shocks of October 1848 yet I find our chimneys are shaken loose by the constant disturbance of shocks for so many months. I hope we shall be able to repair them without taking down.

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Letter: December 16, 1849
As to the shocks we have been reduced to the average state – or rather less – since the end of August.

Source: Chapman, H.S. (1848?): Letter to Sir George Grey. Ref.GLNZ C10 (7) and GLNZ C10 (11), Sir George Grey letters, Auckland City Libraries, New Zealand.
Location: Wellington
Keywords: primary, mainshock, aftershocks, building damage

The earlier shocks were preceded by a loud deep rumbling noise something like the sound of a railway train going through a tunnel, as heard by a person outside and near the mouth. Latterly the sound has been more like the distant booming of heavy guns. Besides the sound, our house which lies N.E. by E. and S.W. by W. almost invariably received the first stroke of the shock at the N.E. corner. [The third severe shock of Thursday 17 October, 1848] did us more damage than all the others, cracking and dislodging the solid brickwork of our oven [bread oven] tearing down the plaster of our sitting rooms, throwing down dairy pans breaking nine, and other fragile articles.

Clarke, Rev. W. B.
Source: Clarke, W. B. (1855): *In: Sydney Morning Herald* [Australia], March 22, 1855.
Location: Wellington
Keywords: secondary, mainshock, aftershocks, atmospheric effects

[The following article, much of it not given here, is mainly concerned with the effects of the 1855 earthquake.]

A few words may be added on the earthquake of 1848. It occurred in nearly the same district as in 1855, which is in agreement with the known occurrences of earthquakes elsewhere – they are repeated in the same localities till, probably, the land shaken is elevated sufficiently to allow the earthquake force to expand itself unimpeded.... In 1848 the wind was chiefly from the East which is unusual, that too, like the present [1855 earthquake], was a wet season. Violent S.E. winds and floods preceded the shocks of the 16th of October in that year. These followed at intervals of 36 hours.

In 1848 the shocks were attended by rain which generally in other countries accompanies dangerous earthquakes. They were marked by violent winds, which in agreement with one phenomena mentioned above, were instantly suppressed at the time of the shock. The noise is said to have come from the northward. The earth, as in 1855, was moved in waves. During the third shock on the 19th October, 1848, "a terrific S.E. storm" was blowing but the wind lulled as in the first shock.

The times assigned to the three principal shocks were, for the first two minutes; and for the two last 90 seconds each. The shocks are said to have been horizontal concussions, as well as vertical undulations. Reports like the discharge of ordnance, or gas, were heard to the northward, succeeded by concussions; and during the three great shocks there was a loud

roaring. Any one who has placed his head to the waste pipe of a steam apparatus blowing off vapour, will understand the resemblance of these earthquake sounds, to the tearing and roaring concussions of the steam in its passage from confinement.

As in 1855, so in 1848, no change in the barometer was noticed; and the shocks occurred in all kinds of weather. This is again, a proof that the atmosphere in unconcerned in these earthquakes. The occurrences of both years show as has been hinted at by the author of an account of those of 1848, that the shocks are connected with the explosion of gas (steam?) in the neighbourhood of Cook's Strait. There were cracks in the loose soil in 1855, but in 1848 it does not appear that there were any jets of mud, or any actual elevation of the land. Even the tide does not appear in 1848 to have been affected, except in one instance, and that only by wind and rain.

Cole, Rev. R.

Source: Cole, R. (1848): Clerical Register/transcribed by H. Wilton Jones. *In:* Jones, H. Wilton: Papers (MS-Group-0395) MS-Papers-5360-2, Alexander Turnbull Library, NLNZ.

Location: Wellington

Keywords: primary, mainshock, aftershocks, building damage, casualty, response/recovery.

[October] 16 Monday

At about a little before 2 in the night we were awakened by a most alarming shock of earthquake. I, Isabella [Hunter, his sister-in-law] & the servant girl got up & remained up for the remainder of the night - in the morning we found the consternation general & great & that much injury had been done to many buildings & many Chimnies thrown down. I alone slept at the Parsonage tonight, Mr St. Hill having pronounced it was yet secure - many slight shocks or tremblings thro[ughout] the day.

[October] 17 Tuesday

At about 3pm when I was in the Post Office a more fearful shock than the first occurred - the Postmaster & I could, with difficulty, get out - great destruction was caused, a wall within a dozen yards of the Post Office fell & buried one man & 2 children - one was killed on the spot & the father & other child were buried before [blank space. Perhaps Cole intended to insert something later.] I slept at Mr Daniel Wakefield's.

[October] 18 Wednesday

The terror continues & slight shocks continue. I slept again at Mr Daniel Wakefield's.

[October] 19 Thursday

This morning at about 5 we were roused by a third terrific shock & got up - much further damage done - I opened the new Church [at Te Aro] for the reception of the homeless. I commenced today daily prayer & Litany, Morning at 9 & afternoon at 5 at Te Aro Church - I came to George Hunter's (Mr Wakefield's home no longer considered safe, being of mud) - many friends were taken in - we none of us went to bed but laid down on mattresses.

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A fast is proclaimed for tomorrow - the propriety of which seems to be generally to be felt.

[October] 16[sic]
Friday Fast Day
10 am. Te Aro outside Church. I officiated & preached …
11½" out of doors near Mr St Hill's for shelter …
3pm Te Aro I officiated same as morning …
4 " Thorndon as on morning …
6pm I went to Te Aro Pa … and conversed afterwards in lieu of sermon

[October] 22 Sunday
Interval observed between 1st & 2nd shocks & then 2nd and 3 (viz. about 38 hours and have passed without the reccurrence of severe shocks. Confidence seems to spring up….

[October] 26 Thursday
"Subraon" Barque (500 tons) went out for Sydney with many passengers, about 45 or 50, frightened away by the earthquakes - was wrecked at the heads, no lives were lost but most of Passengers Property and much Freight.

[October] 29 Sunday
Shocks continue at intervals throughout the week….

[November] 27 Monday
We reopened School (closed in the bad weather of winter) on the Porirua Road. I had gone to meet the inhabitants on the subject on 7th, 17th, 20th & 22nd.

On my return, I found a letter package waiting for me & proving to have been sent by a Committee appointed at a public meeting at Auckland – exaggerated reports had reached Auckland of the desolation & distress occasioned to us by the late Earthquake – consequently with a brotherly kindness ever to be remembered by our Community they met in public to agree to an Address of Sympathy & commissioned a subscription to our aid – a first instalment of £400 with £100 also from the Bishop was forwarded.

[November] 28 Tuesday
I requested the several gentlemen named with me as a Committee for Wellington to meet at my temporary residence (Mr Hunter's) to receive the several communications forwarded & agree as to a course to be pursued – we agreed to call a public meeting for Thursday evening, ½ past 7.

[November] 30 Thursday
At ½ past 7 or about 8 the Committee went to the Public Meeting – I was called to the Chair – a very full and orderly Meeting – the best spirit shown in the Matter of the Address & Aid from Auckland.

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[December] 1 Friday
11am 1 baptized (2). Between October 18 and December 1, both days inclusively, I have baptized 36 children.

3pm the Committee again came to me to a (Committee) Meeting – we resolved to return the £500 & to become henceforth for the Committee as voted at the Public Meeting of last night.

[December] 12 Tuesday
Committee met for the last time to consider the applications for Aid from injuries sustained by the Earthquake – 11 applications (some for loan) – the balance from the Fire Fund of 1842 will meet all (say £70).

Colenso, William
Source: Colenso, W. (1848-9): Various extracts. *In:* Journal Vol. 1, 1841-1848, qMS-0487, Alexander Turnbull Library, NLNZ
Location: Te Kopi, Wairarapa, Palliser Bay, Wellington
Keywords: primary, casualty, ground damage, buildings damage, response/recovery.

November, 1848
p.105-6.
Much commotion among the natives here [Pahaoa, east Wairarapa coast] respecting the Late Earthquakes and the very heavy floods of the winter; and, above all, some exaggerated reports from Wellington concerning the loss of human life during the earthquakes thereafter. I was certainly myself, during my journey hither, surprised to see the fearful effects of the late heavy and constant rains upon the cliffs and littoral thickets and plains....

p.108-9 [At Te Kopi, Palliser Bay]
All around Cape Palliser, and indeed from many miles on the coast, great alterations had been made by the recent shocks of Earthquakes and several floods; in many places, streams of stones had descended from the very summits of the hills to the plains at their bases, which stones being newly broken were very sharp indeed, making it a painful task to travel over them – especially for my poor baggage bearers....

Heard a confirmation of the report of great injury having been done to the town of Wellington from earthquakes....

Notes:

In the first extract, Colenso is evidently aware of the "Late Earthquakes" prior to arrival at Pahaoa. On route he had visited Mrs. Guthrie at the recently established station at Castlepoint. The station was a raupo-thatched building, the chimney of which collapsed during the earthquake ("Early Castlepoint" 1948; Castlepoint Historical Committee, p.10; see also Groves extract). However, Colenso does not mention the damaged chimney in his journal; "2nd Nov. – reached Rangiwakaoma; called in passing on Mrs Guthrie. Hence we travelled on to Waimimiha, a small stream ..."

April 1849

p.167.

...We could not get along under the base of the high and steep cliffs owing to the high sea and lately fallen and still falling masses of mud, so climbing the cliffs we traveled over the high Table land to Upokirikiri [Maori fishing village on the eastern shore of Lake Onoke]....

Notes:

This passage refers to the difficulty in getting past the mudstone cliffs from near Te Kopi and along the eastern side of Palliser Bay, where landsliding appears to have been caused by the earthquakes and/or heavy rains.

p.171. [1849] April 9

After breakfast I went to Wellington, and was surprised to see the great damage occasioned by the late shocks of Earthquake. All the stately brick buildings, which lately lorded it so proud by above their plebeian congenent[?] of wood and rushes – and were, indeed, properly enough, the pride of the rising town – were now prostrate in their dust! Of some, the very ruins were entirely gone, having been removed to clear the sites for rebuilding on. The walls of the parsonage were still standing, but so shattered as to be ultimately untenantable and unsafe. Mr. Cole had, therefore, removed every article therefrom....

p.173.

The large and nearly erected brick gaol had been shattered to the foundations by the late shocks of Earthquakes, and the prisoners were consequently now confined in a small wooden building....

Collinson, Thomas B

Source: Collinson, T. B. (1848): Letter written from Wellington to his mother in England, dated October 25 1848. *In:* Letters 1846-49, Folders 1-3, MS-Copy-Micro-653, Alexander Turnbull Library, NLNZ.

Location: Wanganui, Waikanae, Porirua, Wellington, Nelson, Marlborough, New Plymouth, Hawke's Bay, Kapiti Coast, Plimmerton

Keywords: primary, mainshock, aftershocks, ground damage, building damage, response/recovery.

p. 41-43 [At Wanganui]

I was waiting to give over the blockhouses to the troops, when one night, at about 2 o'clock in the morning I was awoke by feeling the house tremble with a rumbling sound as of distant thunder and then it shook backwards and forwards as if some giant had laid hold of a corner of it to shake it to pieces. After a minute or two it died away quivering. The sentries were thrown down and the blockhouses moved as if they were going to walk off altogether; but no damage was done. Next day we had another and several more; and when the mail came in from Wellington the accounts of the number of houses damaged were so alarming that I started off directly on horseback and rode down the coast as hard as I could. As I approached Wellington it appeared to get worse; at Waikanae there were several cracks, like after a hot summer; at the beautiful harbour of Porirua, the large stone barrack built by the Colonial Government was cracked from top to bottom, and they say it rocked so as to throw the water

out of the Gutters. As we were sitting on a sandhill discussing the subject on a beautiful afternoon, the same rolling sound was heard and the hill quivered again for a few seconds. When I got to Wellington, I found that there had been several shocks and all much worse than anywhere else. Brick buildings were shattered beyond repair; whole sides having been thrown outwards, to some distance; the people all in fear, and numbers hastening onboard ship, or crowding into wooden houses; for the only brick building that had stood the shock was our powder magazine. As to our plans for the new brick barracks were drawn, I was unwilling to alter them, as I thought we could build them strong enough to stand anything, in spite of the outcries on all sides against it; but the day after I arrived, I was standing on the site of the barracks near the Colonial gaol, a large brick building, one gable end of which had been thrown down, and debating the subject, when a roll of thunder was heard underground and at the same instant the hill shook as if a gigantic railway train was rushing under our feet and the gaol shook like as aspen leaf: and yesterday I was in the small brick vault of the bank, which had been cracked by the same shock, when another rattled like a steam train through the ground and all the afternoon the ground quivered like a piece of jelly. It appears by accounts received that the shock has been felt from Nelson and the Kaikouras to New Plymouth and Hawke's Bay. The worst having been in Wellington. It commenced on the 16th and when it will end I don't know; but the most learned say there must be an outbreak [A common belief of the era was that volcanoes were the main cause of earthquakes.] somewhere before it will cease. It is nothing new, for shocks have always been felt in this part of New Zealand, and some as bad and as long as these. I have felt many since I have been here; but it is the destruction of the houses that has alarmed people. You will find the accounts in the papers rather alarming on this account so I hope you will get this letter as soon and that you will also get some later accounts at the same time. I have got a new piece of work now - to devise some kind of building which will stand, fire and wind, war and earthquakes. I expect Dick and Charles Rawson being learned in these matters will give me [some advice]."

Notes:

Collinson was in Wanganui at the time of the mainshock, and first large aftershock, and hence, information on the effects of these earthquakes is secondary. In April 1846, Governor Grey recommended that a brick barrack for fifty men should be built at Paramata. Plans were drawn up at the office of the architect, T. H. Fitzgerald, showing a double storey square structure of stone, being cheaper than brick, with two towers at opposite angles for additional protection. The towers had an additional storey. The outside walls were to be of stone and 2 ft. 3 in, thick, while the inner walls were to be 1 ft. 6 in. thick, with brick guoins and window openings. The ground floor was divided into four rooms for the three officers and a kitchen for the men, a storeroom that also held the magazine and two cells. The upper storey was occupied by the soldiers and could be reached by outside stairs. The roof was probably made of shingles because they were easily available. During excavation for the foundations it was found that there was a continuation of the surface sand and no gravel as Fitzgerald predicted at a depth of 2.5 ft. New specifications had to be drawn up for strengthening the foundations with the whole site to be opened up with deeper excavation for the line of the walls, putting in a 6 in. layer on concrete throughout strengthened by longitudinal sleepers and crossed by scantlings. The timber work was to be of either maire or totara, and set in concrete to be made of one part lime, to three and a half of sand and gravel - the lime to be used hot in the usual way, as an additional support for the walls. In the absence of a source of limestone, sea shells were used for lime and sand from the beach, which would have been salty. The shells were baked in a primitive kiln, crushed roughly and then imperfectly slaked before being added to the rest of the mixture. The bricks were also made on site and were defective in that when fires lit in the kitchen chimneys the floor of the storeroom behind was burnt through. The barracks were completed on 7 August 1847, on which date H. M. Ordinance took over the building from the Colonial Government. (See "The Paramata Barracks" by R. I. M. Burnett. Bulletin No.4, National Historic Places Trust. 1963).

Source: Collinson, T.B. (1848): Report of the earthquakes of October 1848 at Paramata Point, Porirua, near Wellington, dated November 18, 1848, attached to despatches of Lieutenant-Governor E J Eyre to Governor-in-chief G Grey, dated 21 November 1848. [G 7/3, No. 118, Archives NZ/Te Whare Tohu Tuhituhinga O Aotearoa, Wellington Office, NZ.]
Location: Porirua, Plimmerton
Keywords: primary, secondary, mainshock, aftershocks, building damage

The first shock on Monday the 16th October at 1 1/2 a.m. commenced with a subterranean rumbling sound accompanied by a vibration of the ground, and appearing to come from a S.E. direction; followed immediately by an oscillation which shook the Colonial Barrack sideways in the East and West direction and lasting altogether about a minute. The building, which is five stories [storeys] high, with rubble stone walls 2 feet thick and brick guoins and window openings and divided by four partitions was cracked at almost all the junctions of the stone and brickwork from the top nearly to the bottom.

The second shock on Tuesday afternoon was similar to the 1st but not so violent; it opened and extended the former cracks and cracked the main wall on the east side.

The third shock on Thursday morning was similar but more violent than the second; it cracked the partition walls in the upper storey at their junction with the main walls and on each side of the large doors [?]. The soldiers and officers then left the building. The worst cracks are all on the east side; since Thursday the 19th the slight shocks have increased the cracks.

At present if there are no more shocks, I consider it is not in danger of falling except the S.E. tower, in which the cracks are most numerous. But I consider it will never be safe for any person to inhabit it again, because the bond at the angles is so broken that no spanes[?] to the brick or stone work could secure it; and therefore I recommend it be taken down and the materials sold: The timber and bricks and other materials are worth about $250 when taken down.

But I do not recommend it be taken down yet, as labour is very expensive at present; it will be locked up and used as a powder magazine by the Ordinance as long as the troops remain there; and they will be accommodated in huts at the same spot.

T. B. Collinson

Captain R. E.
Nov.18th 1848

Daniell, Henry Cooper
Source: Daniell, H. C. (1848): Letter from Nelson, dated 25 October 1848. *In:* Letters 1841-1854. Micro MS-0511 (Microfilm of fMS-061), Alexander Turnbull Library, NLNZ.
Location: Nelson
Keywords: primary, mainshock, aftershocks, response/recovery.

Nelson 25th October 1848

... We also in our part of the world are experiencing a shaking though of somewhat a different nature. About 1/2 past one o'clock on the morning of the 16th instant the inhabitants of the town and country were aroused by the shock of a somewhat severe earthquake to what we have usually experienced and duration[?] of increased length and force caused most of the inhabitants to rush out of their houses expecting that the next would bury them in their ruins. We prepared ourselves for such a calamity but our merciful providence has preserved us. Since that time to the present the earth has not resumed her ... quiet for almost every six hours for the first four days a very sensible but short shock ... was experienced and gentle vibrations continued to be felt at intervals in fact almost every hour since the first strong shock a motion has been perceptible to persons lying or sitting in their houses. The first heavy shock must have lasted from two to three minutes. The motion experienced by most people was similar to that of a railway carriage in rapid motion. We are thankful to say that as our settlement is concerned no serious consequences have been ... but we are anxiously expecting to hear from the Northern Island there being a volcano in the interior of it. The inhabitants here were pretty generally alarmed and indeed many people have been much indisposed. I have experienced headache and sickness or sinking at the stomach. On Monday the 23, the Wesleyan Chapel was opened for three special services for supplication and thanksgiving and the services were numerously attended, and by many who have been notoriously profane...

Dillon, Constantine Augustus

Source: Dillon, C.A. (1849): Letter to his mother, Lady Dillon, from Auckland, dated January 20, 1849. *In:* The Dillon Letters 1842-1853. Wellington: C. A. Sharp; A. H., & A. W. Reed.

Location: Waihopi Valley, Wairau Valley, Marlborough

Keywords: mainshock, aftershocks, building damage, response/recovery, background, primary

I fear I gave you a most distressing account of the earthquakes at Cook's Straits [*]. I confess I was in a great state of agitation when I wrote, but all the accounts we had heard had been so dreadful that it was enough to fill one with alarm, especially Mr. Eyre's dispatch, and yet one can hardly blame him – to have the ground rocking under one for a month must be disagreeable to say the least of it. It has turned out, as you will have heard as you will see confirmed by the letters and papers I send you, to have been much exaggerated. Nelson has not suffered tho' the shocks were severe. I fancy we have been the greatest sufferers in the settlement, for a new house and dairy which had altogether cost me about 80 or 90 pounds has been leveled to the ground. However, the dairyman made the best of a bad job and has put up a hut which he has built on the same spot again and is quite happy. You see that this colonial life, if it does nothing else, gives elasticity of view and teaches people to help themselves".

*This account has not been located.

Notes:

The following background information on Dillon's Wairau property and the Wairau Valley is extracted from a letter to Fanny Dillon from the "Dairy", Wairau, Saturday 6, December 1850 in the same collection as above.

On 27th November 1850, Dillon writes that he went over the straits with Newcombe to Port Underwood where they had to stay the night because the "tide did not admit of our getting into the river that night". The statement indicates that it was not possible for at least vessels that plied back and forth across Cook Strait to cross the bar at the mouth of the Wairau River at low tide (see Dougherty's report in the Nelson Examiner of December 30, 1848). They managed to get into the river the following morning about 11 a.m. and Dillon started to walk to his "dairy". He left Newcombe at Dashwood's house. Eight miles beyond Dashwood's was about half way up the Wairau Valley. Dr. Monro's station was "about 3 miles" from Dillon's "Dairy" (the Delta Dairy). In 1850, Dillon's new house and dairy [rebuilt after their destruction in the 1848 earthquake] were "both substantial buildings". The house had three rooms and a kitchen and loft, all good sized lofty rooms. The dairy was built with clay walls 18 inches thick with "good, stout timbers in it". The buildings cost 90 pounds to build, similar to the cost of the previous buildings destroyed in the earthquake.

In 1850, Dillon also had a section at the confluence of the Wairau and Opawa rivers, at "the head of a little harbour formed by the mouths of these rivers" [Dillon Point?]. Dillon thought that the area could be the site of a town ("Ditchley") that would become the place where produce from the Wairau Valley could be shipped to Wellington. Dillon comments that all the wool had to be "transhipped into boats and put into sheds" [presumably on the boulder bank near the river mouth from where the wool was ferried to vessels waiting outside the bar]. Also, that sheep had "to be driven an immense [way] round to get only in reality a mile from the mouth of the river" [the sheep must have been driven to a point up river where it was possible to cross the Opawa and then for them to be taken down the other side of the Opawa to the opposite side of the Opawa–Wairau confluence which is about one mile from the mouth of the river]. Dillon also states in connection with subdividing and selling parts of the land to "make a bridge over a deep still creek which runs back from the Opawa" as without this bridge the "section is worth nothing as you could only get to it by swimming". The stream referred to is *Morgans Creek* that enters the Opawa a short distance upstream from its confluence with the Wairau. Morgans Creek is marked (but not named) on Cotterel's 1843 "*Plan of the South Eastern Portion of the Plain of the Wairoo*", also on Budges' 1847 map and named on Irvine's 1901 map. There is no difference in the position or the width of Morgans Creek between the 1843 and 1901 maps. However, on Budges' 1847 map the point where Morgans Creek enters the Opawa is south (~50m) of its location in 1901.

Domett, Alfred

Source: Domett, A. (1848): Letter (No 247) to Superintendent of the Southern Division – New Munster (Major Matthew Richmond, Nelson), dated 25 October 1848. [Superintendent of the Southern Division, Series 1] SSD 1/1, No. 247, Archives New Zealand, Te Whare Tohu Tuhituhinga O Aotearoa, Wellington Office, NZ.
Location: Nelson
Keywords: primary, building damage, response/recovery

Colonial Secretary's Office
Wellington
25 October 1848

Sir,
With reference to the authority conveyed to your honour for the erection of a Gaol at Nelson, I am directed by His Excellency the Lieutenant-Governor to request that, should the Earthquake have been sufficiently strong in your settlement to crack or injure brickwork, you

will not on any account cause the Building to be constructed of Brick. In Wellington it is not intended to put up any more buildings of that material.
Your most obedient servant,
Alfred Domett, Colonial Secretary

Dougherty, Daniel
Source: Dougherty, D. (1848): Letter (No 268), dated December 2, 1848, to Superintendent of the Southern Division – New Munster. [Superintendent of the Southern Division, Series 1] SSD 1/1, No. 268, Archives New Zealand, Te Whare Tohu Tuhituhinga O Aotearoa, Wellington Office, NZ.
Location: Wairau Valley, Marlborough
Keywords: primary, background, uplift/subsidence

Cloudy Bay Dec. 2nd 1848
Major Richmond,
Superintendent of the Nelson District, Nelson
Dear Sir,
... I have been making a few observations on the tides at the mouth of the river [Wairau] and I find that the tide has a rise of 5 feet at high water and that there was 3 feet water on the bar at dead low water so that there will be 8 feet of water on the bar at high water. Any vessel that does not have more than 5 feet can enter the river at any time. As the channel of the river shifts no vessel out [sic] to enter the river with out sounding with a boat or if I am living there and any vessel coming off the bar and hoisting a signal I will go out with a boat and bring her in or buy the channel off so that she may run in in safety. I could not ascertain the exact time of high water at the full and change of the moon as I had no time piece with me but as near as I could judge it is high water at half past six on full and change. Those observations were correct and if you think they are worth publishing for the benefit of the Nelson District you are welcom [sic] to do so with my name....

Notes:

Dougherty's observations were also reported in the *Nelson Examiner* of 30 December 1848. (given below)

Source: Dougherty, D. (1848): [Report of Dougherty's observations]. *In: Nelson Examiner*, 30 December 1848.
Location: Wairau Valley, Marlborough
Keywords: primary, background, uplift/subsidence

The River Wairau
"We have learnt from Captain Dougherty some particulars respecting the entrance to the River Wairau, which is of importance to masters of small coasters and the settlers residing in the district. Captain Dougherty states that during a two months' residence at the mouth of the river [The Dougherty's arrival at the mouth of the Wairau from Cutter's Bay in late October 1848], he had paid particular attention to the rise and fall of the tides, the soundings on the Bar, and other particulars respecting its capability to admit small vessels.

The result of his observations is that there is three feet on the Bar at dead low water, that there is a rise of five feet and therefore, that any vessel drawing not more than five feet may enter the river in safety. The time of high water he believes to be about half past six at the change and full of the moon, but having no timepiece, he could not tell precisely.

During the two months he has lived there, only four days had occurred on which a whaleboat could not enter or leave the river. The *Triumph*[*], which recently conveyed down provisions and other things for the stations in the valley, went over the Bar and proceeded nearly 12 miles up the river[**]. No vessel should enter without sounding as she goes, as the channel sometimes shifts."

Notes:

* The *Triumph* was a vessel that plied between Nelson and Wellington, calling in at Queen Charlotte Sound and the Wairau on the way.

** According the Henry Gouland the river was the Opawa, not the Wairau (see Gouland entry).

As Dougherty made his observations after the main earthquake shock of 16 October, Eiby (1980) suggests that subsidence of parts of the lower Wairau Valley during the earthquake could have improved the navigability of the river mouth by superficial slumping, compaction or subsidence. This supposition is strengthened by the fact that the first vessel (as opposed to a boat) to cross the bar was the *Triumph*, a schooner, on the 25th November, implying that prior to the earthquake the depth of water over the Bar was not enough to admit vessels of this draft. Prior to the earthquake, stock and goods were often landed at White's Bay and then carried overland to the Wairau River and there ferried across. The only boats able to cross the bar were whaleboats that carried out wool and brought in supplies from ships anchored off the bar. Obviously, crossings had been attempted but ended in failure. Apparently, prior to Dougherty, no one had made the effort, or had the time, to chart the "dangerous" river mouth. Dougherty had been surveying the river mouth for "over two weeks" prior to the *Triumph* crossing it on 25th November (Manson 1974, p.276). His letter to Major Richmond informing him of the results was written on December 2nd.

The fact that the *Triumph* was able to sail 12 miles up the Opawa River , i.e. to the present day railway bridge over the Opawa at Blenheim, following the earthquakes strongly suggests that subsidence in the southern part of the lower Wairau Valley occurred as a result of the 1848 earthquakes. According to McIntosh (1940) William Budge, who was living on Budges Island in the lagoons area, informed the Superintendent that 'subsidence of the whole district at the time of the last severe earthquake to the extent of at least eighteen inches' forcing him to leave because the island had become so sodden. According to McIntosh this letter is dated 29th October, 1855. It is interesting that the day and month are close to that of the 1848 earthquakes rather than the 23rd January for the 1855 earthquake, and this suggests that McIntosh may have confused the dates of the two earthquakes as he appears to have done in the text. For example, he states that the (1855) earthquake "began on the evening of January 21 (sic) with a series of terrific shocks throughout the whole district, and continued more or less continuously for nearly three weeks. Nearly every mud whare in the Wairau came down". This reads more like a description of the 1848 earthquakes and where it is also reported by the *Wellington Independent* (October 25th) that; "By a boat from Queen Charlotte Sound and Cloudy Bay, we learn that the earthquake had committed havoc in both those places; the clay houses and the brick chimneys being all more or less destroyed". The only reference to damaged cob cottages in the 1855 earthquake is in the Awatere, not the Wairau, Valley; "In the Awatere, the shock was very severe, and nearly all the cob buildings within twenty miles of the sea, were more or less damaged...." (*Nelson Examiner*, February 21 1855). Also, it is stated that "It was soon discovered that small schooners could navigate the bar and sail up almost to the tidal limits...". As stated above the first vessel (a schooner) to cross the bar and travel up the Opawa River was the *Triumph* on the 25th October 1848. The Budge letter has not been located in the National Archives that houses registered and unregistered correspondence to the Superintendent of Nelson in 1855, but nor has it been found in the correspondence for 1848.

Further notes: background information on the Lower Wairau Valley

Source: The New Zealand Company. Twenty-fourth Report, 50-52.

Between the bay [Cloudy Bay] and the valley at the back spreads a flat, which contains between two hundred and three hundred acres of land, at the most moderate computation. A little river [Opawa?] winds through it, which, though not navigable for boats for many yards above its mouth, may be considered sufficient to supply a town with fresh water all the year round....

... and the flat is sufficiently high in most places to make drainage easy....

A little creek, or lagoon, on the east side of this (the proposed town site) is separated from the bay itself by a narrow spit or bank of mud, which boats might pass at high water.

A committee of Nelson land purchasers appointed to select the most suitable site for the shipping town to the Wairau Valley made a survey of the Wairau River mouth, Cloudy Bay and Waitohi (Picton) in November 1847. A report, written by their secretary Alfred Domett, was sent to the New Zealand Company's Court of Directors in London.

The location of the town site appears to be situated on the SE side of the Opawa River where it joins the Wairau River opposite the passage through the bar - the site of the town of *Ditchley* later proposed by Constantine Dillon.

Settlers collected supplies for their stations and left their wool and other products to await the arrival of a ship off the Wairau Bar. The wool etc. would then be trans-shipped by whale boats across the dangerous bar when possible to the waiting ship. So great was the dread of the Wairau Bar, and also the ignorance about its nature, that no ship took the chance of crossing it. It was left to Daniel Dougherty, the pilot, to chart the bar so as to open up the Wairau Valley to shipping, allowing small vessels to go up the Opawa River to a place known as "the Beaver" (site of future Blenheim) where James Wynen has also established a trading depot [a large *raupo* warehouse, called "Beaver Station", on piles along the Omaka River bank at the foot of Blenheim's High Street].

According to Buick (Buick, T. L. (1900): Old Marlborough. Hart and Kealing, Palmerston North. pp.330-331.), the principal traders to "Beaver" were the schooners "Triumph" and "Old Jack", both of which unloaded their cargoes inside the Boulder Bank (Wairau Bar). The goods were then transported to the Beaver in boats towed by horses. Samuel Bowler and Captain Jackson owned a fleet of boats in which they ferried wool and goods from Wynen's wharf at Beaver to the Boulder Bank where it was loaded onto barges and taken to Port Underwood, and from thence shipped to other places. In 1857, small vessels of from 18 to 40 tones (Mary, Necromancer and Gipsy) were able to go up the Opawa River directly to the "Beaver". They could be towed by a couple of bullocks or rather tacked up river against wind and tide (Stafford papers, miscellaneous; letter from unknown correspondent quoted in McIntosh, p.173-4; McIntosh, A. D. (1977): Marlborough: A Provincial History. Capper Press, Christchurch). This was presumably facilitated by additional subsidence of the lower Wairau Valley during the 1855 earthquake.

Drummond, David

Source: Janson, Hugh (1967): Pioneer Memories at big Nelson Reunion. In: *Evening Post*, 25 January 1967.

Location: Riwaka, Nelson

Keywords: secondary, mainshock, building damage

David [Drummond] well remembered the violent earthquake in 1848. They were then living close to the site of the present Riwaka school in a two-storeyed house. They were all in bed when they were rudely disturbed by a terrible rumble and the house began to rock violently. Their father tore upstairs and got all his children and rushed them out into an adjoining

paddock, where they spent an hour in their night attire. Daylight revealed that everything had been shaken off the shelves, the floor was strewn with broken crockery, glass, etc., and every drop of milk shaken out of the milk pans. Mr. Jacka was schoolmaster at the time and he lived next to them. He had arrived from England only a few months before and the earthquake was a new experience for him. He was so nervous that he did not take his clothes off for three weeks.

Ewen, C. J.
Source: Ewen, C. J. (1848): 1848 Journal. qMS-0705, Alexander Turnbull Library, NLNZ.
Location: Wellington
Keywords: primary, mainshock, aftershocks, building damage, casualty, response/recovery, atmospheric effects.

[At Wellington]
Monday morning (October 16). A horrible night. At about 1 o'clock in the morning I found myself almost jerked out of bed by a very violent shock of an earthquake which lasted long enough to give one time to rush (naked) as I was into the yard, hardly able to keep my legs, where I distinctly observed the house rocking to and fro and the earth heaving convulsively. The landlords family who were sleeping in the upper story [sic] also rushed downstairs and out of the house. The shock was so great as to throw down a quarter part of the gable end which was brick, also numerous brick buildings in the neighbourhood and quantities of chimnies [sic]. As soon as the agitation had in some degree ceased, I proceeded to put on my clothes, fearful that the walls might fall in whilst doing so. The earth the whole time was in a perpetual motion apparently long ... We had numerous smaller shocks during the night and at daybreak the scene of desolation and ruin that presented itself was melancholy indeed - everyone ... whole families deprived of their comfortable dwellings, not a single chimney to be seen in most of the houses, - and in fact the whole place miserable indeed. But a most providential escape of life, not a single individual having been hurt. During the whole day we were in a state of the greatest excitement dreading a second visitation. However the weather cleared off in the evening and stars made their appearance but few slept during the night and at 4 o'clock & 7 1/2 in the morning of the 17th two light shocks took place. In ~~Wednesday~~ the afternoon the band played on Thorndon Flat and many people attended. The day was remarkably fine but there was an unnatural glow in the air and the wind was from the SE the same as on Thursday morning. At 3 1/2 o'clock I was proceeding along the beach [Lambton Quay] to my lodgings, when a shock took place which surpassed any of the previous ones ... in violence or in its consequences. Every house in the town rocked and quivered as a ship in a gale of wind and numerous buildings and walls of brick fell in or were so shook as to render habitation dangerous, And shocking to relate a ... Bk [Barrack] Lovell with his two children who were coming out of a large Government Store were buried in the ruins. They were immediately dug out - one child, a girl of 4 years was quite dead, the other, a boy of 8 much injured and the poor father with a terribly bruised limb and other contusions. They were all removed to the ... Hospital. But few buildings resisted the shock. The Colonial hospital was

obliged to be vacated, the patients taking refuge in Government House - the Gaol as well, also the ... Hospital? Sunday night ... and daylight again dawned upon our town. Many walked about and dare not h... themselves in any ... of shelter, whilst numbers formed tents in the open air. As for my own house which was chiefly composed of brick, it was a complete ruin on Tuesday afternoon, all the walls falling down. The family had barely down to make their escape and Barry who was in the house at the time was miraculously saved. I got a party of soldiers to clear away my property from the ruins after it was over. Everything of course all but spoilt, crockery broken, my furniture scratched and knocked about, and all my little nicknacks covered with mortar ... I was obliged to put it all in the street in a heap until I could get a house.... I packed it up as quick as I could, of course not over particular about the proper places for each article. I was fortunate enough in getting a smart wooden house for shelter where I put all my goods, dining and taking my meals with some of my brother officers who had kindly offered their house as a "refuge" for the destitute. I went in the course of the day to see ... Barrack Sergeant and a miserable scene it was, he ... almost dead and in great pain; the child scarcely alive and the poor de ... wife and mother moaning piteously by his side. It is enough to appall the stoutest heart, but we must be thankful to God that such a little sacrifice of life has been made.

Thursday [Wednesday] October 25th. The shocks have continued up to the present time without interruption some more or less violent accompanied by a rumbling noise which is much terrific. The weather is remarkably fine and hot, the nights clear and starry. The appearance of the town is indescribable - all the brick houses are more or less demolished, - all the chimnies also - business at a stand still. The ships in the harbour, of which there are at present great numbers thronged with foolish people who have an idea that they are safer at sea - as if we were not all equally liable to be snatched away from this world at any moment. Altogether these are wretched times, but wonderful is it there has been no more loss of life. I posted this evening a letter and 2 papers home also 2 papers to De Larp ... in? The *Subraon* is expected to sail tomorrow morning by daylight.

Thursday 26th. Beautiful morning up at 7 a.m. when another shock, the earth still tremulous. The *Subraon* sailed for Sydney taking my letters and papers, Capt. Young and all the people who had deserted Wellington in consequence of the earthquake.

Friday 27th. A beautiful morning. Many shocks during the night. This morning news came into the town that a dreadful calamity had happened to the *Subraon*; that she had been wrecked on Barrett's reef whist endevouring to beat out of the heads. This upset was ... confirmed and all those who were ... hastened out to render what assistance they could. We officers had a parade in the morning to flog 4 men (50 each) and therefore were not able to start till the afternoon which we did in a ?body – a long distance about 6 miles over hills. On our arrival, a melancholy spectacle presented itself. The vessel rolling to and fro on a rock with her nose in the water on one of the worst spots that could possibly have heave ... out. The passengers about 60 (chiefly families) with their baggage all encamped on a rough beach, whence they had been obliged to ... them ... and all in a woeful plight. The men were

employed in saving all that was possible but it was expected that at high water she would go to j... and all the baggage lost. The passengers evidently considered it a visitation for ...ming? to fly from the face of ?Gods and will probably ... at Wellington having lost them all.

Saturday 28th. Still the shocks are going on. The passengers of the *Subraon* have nearly come in to town. I forgot to mention yesterday that I had the pleasure of receiving a letter from my Aunt which was dated Dec. 6th 1847 and appears to have come to Auckland per "Acheron" through a ... to the Bishop.

Sunday. Very fine. Slight shock during the night.

Monday 30th October. 2 shocks last night. The Gov. Grey arrived this morning from Wanganui...

Tuesday. Fine; 1 shock during the night....

Wednesday. Very wet and squally. No shocks during the night. Some may hope that it is now all over.

Thursday. Very fine and hot. The *Subraon* sold for £550.

Friday. Very fine and several shocks yesterday morning.

Saturday. 2 shocks last night. A beautiful day. *Harlequin* sailed for Sydney taking 2 letters and 6 newspapers home and two papers to De Leipien?

Sunday Nov. 5th. Very warm and fine with occasional slight shocks. [No further shocks mentioned in the next week.]

Eyre, Edward John (Lieutenant-Governor)

Source: Eyre, E. J. (1848): Despatch No. 116 from Lieut. Governor, E J Eyre to Governor in Chief, G. Grey, dated 20 November 1848. [Governor, Series 7] G 7/3, No. 116, Archives New Zealand/Te Whare Tohu Tuhituhinga O Aotearoa, Wellington Office, NZ.

Location: Wellington

Keywords: primary, aftershocks, response/recovery

Government House
Wellington 20 Nov.1848
Sir,

Since my last despatch No 105 of 29th Oct. 1848 [*], shocks of Earthquakes have still been felt occasionally up to the present time; the principal ones have been.

Many ?sharp shocks have been from time to time experienced but have been too insignificant to be worth recording; neither have any of the above been of sufficient violence to do any damage.

31st - Oct.	8 p.m. rather smart shock
8 – Nov.	1 p.m. Heavy shock with grating sound underneath
15 – "	1 p.m. Another smart shock
16 – "	1/4 past 3 p.m. Heavy shock
" - "	Midnight – heavy shock
19 – "	1/4/ to 10.p.m. Slight shock

The inhabitants seen now to have quite recovered from the alarm which the continuance and anxiety of the shocks had at first occasioned – Chimnies [chimneys] were in many instances rebuilt and others only repaired from the difficulty of getting bricklayers – new wooden buildings are rapidly taking the place of the mud and brick ones which were destroyed, and in fact a general activity prevails in the town which is strongly indicative of the restoration of public confidence,

I have the honour to be,

Sir,
Your Excellency's most obedient Ser.
Lieutenant Governor,
E. Eyre.

Notes:

* Previous despatches from the Lieutenant Governor are given under "Papers relative to the Recent Earthquake at Wellington" extract.

Featherston, Isaac

Source: Featherston, I. (1848). Letter to [Charles] Clifford from I. Featherston. *In:* Charles Clifford Papers. Hem 151, Manuscripts Department, Canterbury Museum.

Location: Wellington, Nelson

Keywords: primary, mainshock, aftershocks, building damage

[Note that Featherston's handwriting is difficult to decipher.]

Wellington October 25. 1848
Dear Clifford,
In ...? your being alarmed by exaggerated reports which Governor Eyre had been pleased to term our recent visitation, I think ...? in a few words what really has occurred so that you may be ...? to ...? in the unfavourable ...? of our settlement which such reports written by him make the terrors of a ...? calculated to produce. It would be a nice ...? to your part if in reading the various accounts which will reach you by this mail, of the recent earthquake you put down nine tenths of what is said with ...? often expected state of the ...? of identity. ...?...?...? is a maximum extremity applicable ?from ...? ...? at the present time. Not ...? with which has already ...? ?place, one half of the people, are torturing their imaginations ?to discover some ...? Horrible ?finale. They are wavering between two opinions – viz. ...? that a volcano will suddenly burst forth and blow them up – no one knows when, or that the earth will open, and suck them all into the lower regions. It is difficult to say which of these

causatory theories is the most persistent but say what you will you cannot persuade them whether ...?...?...?, ... it is most difficult to ...? that they write in their accounts home paint the earthquakes in far blacker colours than they deserve.

On Monday morning the 16th at 20 minutes to 2 a.m. we all found ourselves undergoing a most severe shaking which lasted about a full minute. The houses rocked to and fro – the tops of the chimnies [chimneys) in some ...? houses falling upon the roof and the crockery giving such a undeniable proof of an universal smash, as effectually breaking all hopes of dinner parties for some time to come. This first shaking over, the town for the next few hours accommodated with & suffered of small shocks – each shock accompanying the others so rapidly that the undulations could scarcely be said ..? to cease. It ...? blowing a S. East gale at the time. I had not the courage to leave my bed before my usual hour but in the forenoon in making a tour of discovery, I found that a majority of the chimnies [chimneys] were in a rickety state and some slight damage had been done to some of the brick buildings tho most of these appeared none the worse. The barometer, which usually varies in a Sth East wind had fallen to 27 3/10ths. The shocks continued every few hours, at times every few minutes until Tuesday afternoon at 20 to 4 p.m. when another shock most ...? And severe tho' scarcely as long as that on the preceding morning, occurred to complete the destruction of almost every chimney on the plain, while there was scarcely a brick house or store which had not received several rents in some cases part of the walls being laid prostrate. The shocks still continued as frequent as ever being preceded by a very distant rumbling noise, like that of distant cannon & on Thursday morning at 5.a.m. the third severe shock greater in intensity than the two previous ones, left any ?...ing shocks ...? B better ...? in the way of laying the brick buildings to perfect ruins. All the shocks after this much less tho' not less frequent ...? (Sunday the 24th) we were visited by another sharp shock and since then we have seldom been free from slighter ones for more than a couple of hours. The barometer has been ...? since the middle of last week, being now 30 3/4. The wind has been alternately S.E. and N.E. the weather the last few days being thankfully fine. The ...? of the shocks seems to have been N to S. Wanganui where hitherto the earthquakes have been most severely felt seems not to have experienced such severe shocks as no harm. At ...? judging from the accounts received, I imagine they have been much the same intensity as here. At Nelson, perhaps less severe. We cannot learn whether any volcano has broken out. It is strange that Otago they say that had felt no shock up to the Wednesday (the 18th). Ridgeways, Rhodes, Masters Fitzherberts, large stores are in ruins and all others modestly damaged the offices and the hospital are quite ...? top of the chimnies. The destruction of property is thus most serious and yet I cannot but regard it as providential that this calamity has not been deferred for a few years, when in all probability the whole town would have been built of brick. When you consider the nature of the mortar with which in these buildings (brick and clay) ...?

Notes:

This account clearly indicates that damage during the first (main) shock of the 16th was of limited extent, i.e. chimneys "rickety" (but not fallen) and hardly any brick buildings severely damaged. The aftershock on Tuesday

17th caused widespread collapse of chimneys and brick structures, while that on Thursday 19th (according to many, the strongest shock) completed the destruction of any remaining parts of damaged structures (see also Collinson and Fitzherbert extracts).

Field, H. C.

Source: Field, H. C, (1897): Notes on the recent Earthquake. *Transactions of the New Zealand Institute* 30: 447-457.

Location: Wellington, Wanganui

Keywords: secondary, building damage

p.448

The next one, in October 1848, was evidently far more severely felt at Wellington than at Wanganui, as it did much damage in the infant city, and caused many people to leave it; while in Wanganui no injury was sustained of any consequence, and but little notice was taken of it.

Notes:

Field's statement that Wanganui received "no injury" verifies the account of T. B. Collinson and others but is at variance with the account of ground damage given by Rev. Richard Taylor (q.v.).

Source: Field, H. C. (ca 1904): Typed article called "Wanganui Earthquakes". *In:* Burnet, J. H. (1904): Scrapbook, Extracts Book B. Whanganui Regional Museum Collection, Wanganui, New Zealand.

Location: Wanganui, Awatere Valley, Marlborough

Keywords: primary/reminiscence, mainshock, faulting, building damage

The next sharp shock was in October 1848, and this was far worse in Wellington than here, only a few chimneys in Wanganui being damaged by it. It was however, very severely felt in the Middle Island, and what is known as the "earthquake crack" which extends from the vicinity of Blenheim into the Canterbury Provincial District for a distance of about 50 miles, was either caused by it, or only attracted attention afterwards. This crack is what is geologically known as "a fault" in the strata, and the ground to the eastward of it sank down, while that to the westward either rose or retained its level. Settlement in this part had extended so short a distance from the main centres, that it is not known whether any noticeable change of level occurred in this island at that time.

Fildes Collection

Source: Fildes collection (undated): Fildes newspaper clippings Vol. 636 (various dates, generally unknown). *In*: Fildes Collection, Victoria University of Wellington, Wellington, New Zealand.

Location: Wellington

Keywords: secondary, mainshock

p.12.

An earthquake in 1848 did some injury to the reputation of the young settlement. Chimneys were thrown down, houses cracked, crockery and bottles broken, and the quiver of the earth was so great that people had difficulty keeping their footing. This shock, however, did not do so much damage as the one in 1855, principally because the town was not so large.

Fitzherbert, William

Source: Fitzherbert, W. (1848): An account of the earthquakes in New Zealand. *New South Wales Sporting and Literary Magazine and Racing Calendar*. Sydney, Australia: D. Wall, 76 York Street. Abstracted in: *Report of the Committee appointed to investigate and report upon Seismological Phenomena in Australasia. In: Report of the Third Meeting of the Australasian Association for the Advancement of Science*, Christchurch, N.Z. January 1891 (Sir James Hector, ed.), 505-532.

Location: Wellington.

Keywords: primary, secondary, mainshock, aftershocks, atmospheric effects, building damage, casualty, ground damage, tsunami/seiche.

[Note: Not all the article was written by Fitzherbert.]

The Settlement of Wellington, in New Zealand, has recently been visited by a series of earthquakes, of a most violent and, in that colony, of an unprecedented character. From the time of the first discovery of the New Zealand islands, earthquakes have occasionally been noticed; and the existence of the hot springs at Taupo, situated in the middle of the northern island, has left no doubt in the mind of Geologists that volcanic agency was consistently in operation; nay, it is said that, from the high temperatures of the springs at Taupo, the aboriginals living there boil their fish in the water without the assistance of fuel. Captain Furneaux's crew "very sensibly felt the shock of an earthquake" on the 11th of May, 1773, and, between Lake Taupo and Cook's Straits, earthquakes have been frequently felt since Wellington was established in 1839. These, however, have been of so slight a nature that the shocks have almost been forgotten so soon as they have passed over.

The succession of shocks which have recently occurred reminds us of the famous earthquakes by which Spoleto, a town in the Pontificial States, was almost destroyed about 14 years ago. At Spoleto the shocks continued, with very slight intermissions for a period of six months. The inhabitants left the town and lived in the suburbs in tents; and the houses and public buildings, nearly all of which were substantially constructed of stone, were more or less rent, shaken, and shattered, by the vibrations and undulations of the ground. One curious circumstance, which was related to us, we can't omit mentioning. For its truth we don't vouch, though we were solemnly assured by several respectable persons at Spoleto, and by our cicerone in particular, that, what we are about to state was perfectly true. At the time of one of the shocks, a peasant was standing in a room, in a house built of stone. The shock was so severe that the wall of the house became vertically opened for a few seconds. The fear of the peasant caused him to lose his presence of mind; and thinking that the house must fall, he rushed through the yawn: in his transit the shock subsided, the wall closed, and crushed him

to death; in short, as our informant told us, the peasant was never seen afterwards, but remained closed in the wall. The earthquake at Spoleto must have been severe; for when we visited it in 1836, about two years afterward we found shorings against the buildings and dilapidated houses in every street in the town.

The elements of heat, air, and perhaps water are indispensable in producing the phenomena of earthquakes; and in ascending the cone of Etna during an uneasy state of the mountain, we were repeatedly thrown off our legs by the shocks, which, from their loud reports and from the vibratory motion accompanying them, conveyed the impression that pent up air was expanded, or that water was by heat converted into steam, the expanse of which splintered the rocks, produced a report like a park of artillery, and laid prostrate on the ground.

With these prefactory remarks we shall proceed to lay before our readers an account of the recent earthquakes at Wellington, as witnessed by Mr. William Fitzherbert, a gentleman who has for many years resided in Wellington, and to whom we are indebted for the following interesting details.

"During the whole of the last winter (1848) the district of Wellington experienced much less wind than usual, and during the same period the wind came principally from the east, which was a very unusual circumstance. The rain during the same period had been abundant. For eight days previously to the 16th October heavy rains were constant, the wind being in the south-east, and blowing a gale; and the highest floods known for three years occurred in the town.

"The earthquake consisted of "three grand shocks" occurring at intervals of about thirty-six hours, and followed by a succession of minor shocks that extended, according to the latest dates, over a period of one month....

"The first shock was felt at about twenty minutes to two o'clock, a.m.,. on the 16th October – the characteristics oscillatory, not rapid, unaccompanied by noise. It was attended by a most remarkable phenomenon – viz., the instantaneous suppression of the gale [same in 1855] which was blowing at the time, and which sprang up again with redoubled fury on the termination of the earthquake, as if it had been "bayed back".

"The second grand shock occurred about 3 p.m. on Tuesday, the 17th October. The day was beautifully fine, the wind variable but light. A slight report and shock first occurred, followed instantly by a loud roar and *tremblement de terre*. The noise came from the northward. The earth in some parts was moved in waves averaging about 12 in. in height. Some persons were thrown down (partly, perhaps, from fear), but all found more or less difficulty in walking. The movement may be defined as a horizontal rapid concussion. Several brick buildings and walls were thrown down, and there were three lives lost. The duration of this shock was ninety seconds.

"The third grand shock occurred about 5 a.m. on Thursday, the 19th of October. It was accompanied by a loud roaring noise, and was the most violent of the three. It happened in the midst of a terrible storm from the south-east, with the same temporary lull observable at the first. It completed the destruction of the brick buildings.

"Subsequently to the three grand shocks numerous slight tremors occurred: forty were counted in the course of one afternoon, but their character differed altogether from that of the first. In the two last of the three grand shocks the roaring was certainly considerable, but it was inconsiderable as compared with the concussion, whilst in the minor shocks the vibration was trifling as compared with the report. Loud reports, precisely resembling the discharge of distant artillery, or the escape of gas, were heard to the northward, succeeded by slight concussions. Sometimes these concussions were vertical, sometimes horizontal; a motion travelling beneath the feet was palpably perceptible. On all occasions persons walking or riding felt the shocks much less (in some cases, not at all) than those sitting, and these again much less than those lying down. Horses, cows, and poultry evinced great alarm.

"One extraordinary high tide occurred during the period of the earthquakes; it was not, however, contemporaneous with any particular shock, and may be rationally accounted for otherwise. The south-east wind, which blows directly into the harbour, had prevailed for a long time, and, as unusually large quantity of rain having fallen, the harbour was overflowed, The rise of tide was about 18 in. above its ordinary level. It was observed that the shocks occurred at all times of tide, at all indications of the barometer, in rainy and in fine weather.

"Several rents were observed in the ground, chiefly where the soil was gravelly or of a loose character, along the edges of cliffs and terraces; but none were of any considerable depth or breadth.

"The thickest walls fell the most readily, unless there were bonded-timbers in the walls, in which case the elasticity of the timber mostly preserved the buildings. *Caeteris paribus*, a 9in. wall withstood better than a 14in. one.

"The mortar seemed to be a matter of little consequence: it was bad in most of the buildings, but even where Roman cement had been used the walls fell just the same; only that, instead of the bricks falling separately, they came down in masses of eight and ten together.

"Hipped roofs stood decidedly better than gable-ends; the roof seemed to act as a tie to the walls. The chimneys of many houses were twisted.

"It would be difficult to furnish an estimate of the positive damage done, but it must have been considerable, although confined to comparatively few individuals".

In addition to the foregoing interesting account of the earthquakes, Mr. Fitzherbert has presented us with drawings, from the pencil of Mr. Robert Park, of Wellington, and eminent Engineer and Surveyor, of some ruined buildings; and as we believe they are the first which

have arrived in Sydney, we placed them immediately in the hands of our lithographer, for the purpose of conveying to our readers some idea of the effects of the earthquakes. The first sketch represents the wreck of Mr. Fitzherbert's store in Farish Street, Te Aro Flat; the the second, the Ordnance Store opposite, formally the property of Mr. Waitt, but which we understand he recently disposed of to the Government, and the sale was only completed a very few days before the first shock was experienced. The fourth sketch represents the large brick store of Messrs Hickson and Co., abutting on the beach, and within pistol-shot of Farish Street. The third sketch represents the Colonial Hospital on Thorndon Flat, a distance of nearly a mile and a half from Farish Street; and it was from this building that the sick were removed to safety into the residence of the Lieutenant-Governor.

These, however, are only a few of the buildings which have either been shattered or destroyed. The Episcopalian Church and the Presbyterian Chapel, which were constructed of wood, escaped, whilst the places of worship of the Wesleyans and Independents, which had been substantially constructed of brick, are now razed to the ground.

Notes:

According to the Research Committee this, and other information supplied to the Committee about the 1848 and 1855 earthquakes by W. B. D. Mantell, came from documents that were then (1891) very rare (see Research Committee extract).

Fleming, A. M.

Source: Fleming, A. M. (unknown date): Chapter 48. Early Awatere. *In:* Woodhouse, A. E. (ed.) (1940): *Tales of Pioneer Women: Collected by New Zealand Women's Institutes.* Whitcombe & Tombs Ltd., New Zealand.

Location: Awatere Valley, Marlborough

Keywords: secondary, mainshock, building damage, ground damage, faulting

p.177

In 1848, and again in 1855, dreadful earthquakes rocked the whole district making "the Mountains to skip like lambs". The original Altimarlock homestead was badly damaged, and the wide deep gulch which runs from the sea via the Awatere Valley to the Acheron in the Hanmer district was caused by the terrific upheaval of 1848.

Notes:

The original *Altimarloch* homestead was of cob construction and was probably occupied by William McRae at the time of the 1848 earthquake. During the Christmas of 1847, William McRae started from Tophouse with a flock of sheep from the Wairau to stock *Blairich*, and with the help of his men, he built the first cob house as a home for his family (Holst, C. (1964): *Red River to Blairich.* Privately published, 48p.). According to Kennington (1978) [*The Awatere: A District and its People.* Express Printing Works, Blenheim, N.Z.], the cob house had three rooms with a sleeping attic reached by an outside stairway. The information about the damage at *Altimarloch* in 1848 came from the station owner, Mr. K. P. Mowat. Frederick Weld does not mention damage to the house in his retrospective diary entry for October 16 1848 (see Weld extract). When first established in 1851, *Altimarloch* was an 80-acre homestead section within the much larger *Blairich* property.

In 1855, *Altimarloch* was owned by Alexander Mowat. It was also a cob homestead and was badly damaged by the 1855 earthquake (Mowat Family papers: 1855-56. MS-Papers-125, Alexander Turnbull Library, NLNZ).

Fox, William

Source: Fox, W. (1848): Letter to the Secretary of the New Zealand Company, dated October 31, 1848. *In:* The *New Zealand Journal* (published in London), May 19 1849.

Location: Wellington

Keywords: primary, mainshock, aftershocks, response/recovery, casualty, building damage

p.115-116

Sir – I beg to refer you to my separate despatch giving you an account of the earthquake, which has occurred here, and to my private letters written subsequently, as the *Subraon's* mail was deferred from day to day, and I was anxious to put you in possession of the latest information on the subject. The accident to the *Subraon* has now delayed her mail, and I am able to report (apparently) the total cessation of the commotion, no shock having occurred for several days, and the subterranean noises having now almost completely ceased.

Now that all fear of the shocks becoming more severe has ceased, and we know the limited extent to which they actually occurred, all alarm has subsided, confidence in the place appears entirely reassured, and I hear that most of the intended passengers by the *Subraon* will remain where they are. The owners of the damaged buildings are beginning to erect new or repair their old ones, and the event is already regarded as little more than a nine day's wonder.

The worst result which it is possible to foresee is the probability that it may alarm intending emigrants at home. For my own part, judging by the accounts of average earthquakes in other countries, the actual extent of this, and the traditions of the natives in reference to the subject, I should feel no hesitation, if I were at home, to emigrate to New Zealand. There may, no doubt, be worse in store for the colony, but when it is considered what sharp shocks were felt in London in 1750, and in Scotland for many days in 1839 (not to mention many minor indications there of volcanic action) and that no repetition of severe shocks has occurred in those places for such long periods, we may fairly hope that the late event here has also been of accidental origin, and will prove to be of solitary occurrence.

Calm-judging people, in estimating its importance, will take into consideration the results of this event. Three lives only have been lost, which occurred by the falling of a wall as the parties killed were passing. A large vessel sailing at the very moment when the alarm was greatest, for a port which is usually the resort of any who leave New Zealand, only found about forty souls, including children, willing to take advantage of the opportunity; and the vessel having got ashore in going away, the passengers who have relanded are, I hear, likely for the most part now to remain. The danger of a voyage by sea, is, in fact, greater than any that we have been subjected to, and probably every one who travels 100 miles on a railway, incurs a greater risk than he would do by living a lifetime in this place.

The feature which is most calculated to give an exaggerated view of the violence of the commotion is the fact that so many brick buildings and almost all the brick chimneys in the place were thrown down, or so much injured as to be unsafe. To a very great extent, however,

this has been owing to their exceedingly insufficient construction. Lime is obtained here from the other side of the Straits, and was long an expensive and scarce article, and much shell lime, which is a very inferior article, has been used. Owing to its costliness the builders got into the habit of using as mortar a sort of clay or marl, in many instances unmixed with lime, but oftener with a little lime in the proportion (as a bricklayer has assured me) of a bushel of lime to two wheelbarrows full of the other rubbish. The result has been that the bricks in reality only hold together by their own weight, and a very trifling force is sufficient to dislodge them. To give you demonstrative evidence of this I have myself visited the ruins of several of the brick buildings, including the gaol and Methodist chapel, in which I am told an unusually large quantity of lime was used, and I now enclose packets of this curious building material, picked off the fallen bricks by myself, and labeled for your information. In two or three traces of lime are discoverable by the eye, and possibly in all by chemical analysis, but some of them appear to be entirely devoid of it. To test them I also enclose a small portion of the clay or other earth of which bricks are made, the same substance being burned into bricks and slaked into mortar. The latter I got in a large-brick field; part of it was broken off an unbaked brick, part picked in the pit whence the material for bricks was dug. Some chimneys built of English bricks and cement remain uninjured. The insufficiency of the mortar is proved also by the fact that in no instance which I have seen have the bricks been shattered by the shocks; yet they are very bad, being not made of a true clay, but of a brittle yellow substance, as you will see by the sample sent. Had the mortar been such as I have seen in English buildings of a good class, the bricks would have been rent.

So few Englishmen have had any previous acquaintance with earthquakes that we are not able to obtain much information as to what may be the most desirable substances and forms to resort to in building for the future. It is most probably that science has, in volcanic countries, determined many of these matters, in reference to the presumed *maximum* of oscillation, and other facts, which, however, I am sorry to say have not been observed with much accuracy on this occasion. If, however, the Court of Directors could procure any information bearing on such points, either from men of science at home, or from practical persons in South America, the Mediterranean, or elsewhere, it would probably by of much use in giving confidence to such as may wish to provide against a similar contingency for the future.

Since my last I have heard again from Nelson, under date of the 19th of October, when all the most severe shocks had occurred, and have seen personally the master of a small vessel thence, which left after all the shocks had taken place. Both accounts confirm those previously received, limiting the amount of damage to a few chimneys. – I have the honour to be, Sir, your most obedient servant.

FOX, WILLIAM - Acting Principal Agent.

Notes:

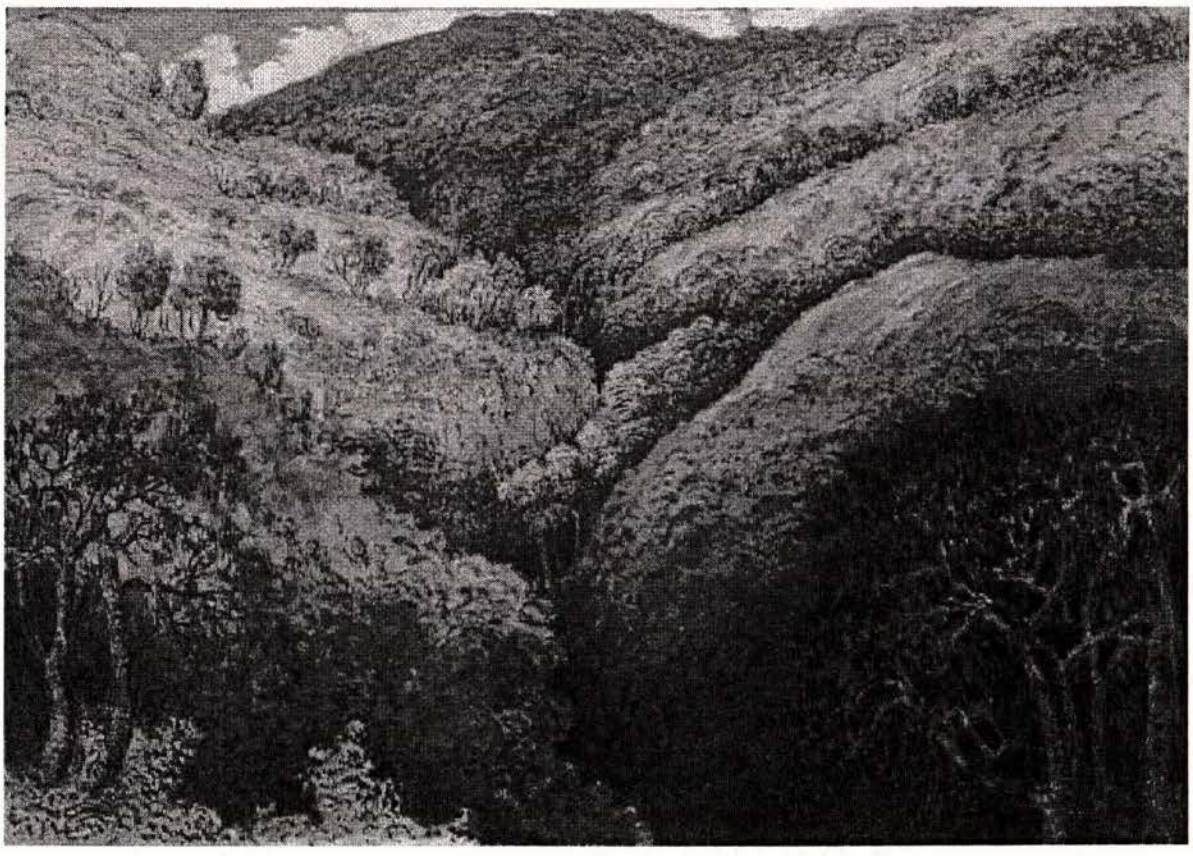
This highly biased account was clearly written to downplay the damage caused by the earthquakes in Wellington so as to allay the fears of the Directors of the New Zealand Company in promoting emigration to New Zealand.

Source: Fox, W. (1848): Receipt given to New Zealand Company. MS-Papers-2835, Alexander Turnbull Library, NLNZ
Location: Wellington
Keywords: primary, casualty, building damage, response/recovery

Wellington 1st Nov. 1848
Rec^{d} from the New Zealand Company the sum of seven pounds being the amount disbursed by me to a working party of the 65th Reg^{t}. engaged in rescuing the property from Company's offices at the time of the earthquakes. £7. 0 - 0 stg.
signed William Fox.

Gold, Charles Emelius
Source: Gold, C. E. (1849): Watercolour, annotated "Gullies formed by Earthquakes, Wellington, New Zealand 1849". B-103-006, Alexander Turnbull Library, NLNZ
Location: Wellington
Keywords: primary, ground damage, art works

The title of the painting is: "Gullies formed by earthquakes, Wellington New Zealand 1849". Probable viewpoint is the old Porirua Road, looking south west into Ngaio Gorge. Presumably, the earthquake "gullies" are the bare parts of hill slopes that represent landslides caused by the 1848 earthquakes.



Gouland, Henry Godfrey

Source: Gouland, H. G. (1848): Diary 1812–1872. q MS-0863, Alexander Turnbull Library, NLNZ

Location: Wairau Valley, Marlborough

Keywords: primary, mainshock, building damage, background, uplift/subsidence

Oct.16 [1848]. Awoke at 2.30 a.m. [sic] by the great earthquake of 1848 - House thrown off piles.

Nov. 29 [1848]. The Triumph passed up the Opawa, being the first vessel that crossed.

Notes:

Gouland was a retired British official from India who initially lived on the bank of the Opawa River at a place called by him *Budji Budgi,* after an Indian District in which he had been resident. He later settled at Spring Creek, where the ferry over the Wairau River was long known as "Gouland's Ferry". According to Joseph Ward (Diary, May 1847-January 1848, Alexander Turnbull Library, NLNZ), William Budge's station during his survey of the Wairau in 1847 was on the Opawa and afterwards was called "*Budge-budge*". Gouland was living at Budge's station at the time of the earthquake. He had purchased it for £40 in November 1847. The fact that the house was thrown off its piles indicates that it was probably a *raupo* hut, rather than a cob cottage. The diary entry of Frederick Weld at Flaxbourne mentions that the earthquake threw Mr Gouland's house down (see Weld extract).

Grayland, Eugene C.

Source Grayland, E. C. (1959): *New Zealand Disasters, 2nd edition.* A.H. & A.W. Reed, Wellington. 208 pp.

Location: Wellington

Keywords: primary, secondary, mainshock, aftershocks, building damage, casualty, response/recovery

p. 12.

The house rocked violently, bells rang and clocks stopped. For about three-quarters of a minute the shock was so strong that it was with difficulty I kept my legs. It continued with some force for two or three minutes, and the whole vibration lasted 10 minutes. For an hour the shocks scarcely ceased. During the whole morning until between 6 and 7 o'clock the intervals were not long, and the tremulous motion of the earth was nearly incessant.

p. 14.

The Colonial Hospital was so severely damaged that patients had to be moved to Government House. The patients at the military hospital in Sturdee Street were taken to the wooden barracks at Mount Cook, while prisoners were removed from the gaol and placed in the custody of the soldiers. The homeless were given shelter by those fortunate enough to have wooden houses. Many, however, preferred to walk about all night, not trusting themselves inside any sort of building. Others found tents and other covering in the open air to sleep beneath, or took refuge in the bush. The barque 'Subraon' was at the time lying at anchor in the harbour and several families took refuge on board.

p. 14.
Barrack-Master-Sergeant Lovell and two of his children (aged four and eight) who were passing down Farish Street at the time were buried beneath falling bricks from the wall surrounding Fitzherbert's stores. Though they were quickly dug out, the girl was already dead and the boy and his father died from their injuries – the first white people killed by earthquake in New Zealand.

Groves, H. G.
Source: Groves, H. G. (1940): Early Castlepoint: pioneering life on the East Coast. Wairarapa Times-Age, Masterton, New Zealand. A copy also held in: Groves family papers – Correspondence and papers relating to Castle Point 1849–1940, MS-Papers-0347. Alexander Turnbull Library NLNZ.
Location: Castlepoint, Wairarapa
Keywords: primary, mainshock, building damage

The chimney of their hut, built of clay and boulders was wrecked, date October 16, 1848.

Notes:

The hut was at Castle Point Station where Thomas Guthrie and his wife had recently settled. (See William Colenso extract).

Halse, William
Source: Halse, W. (1848): Journal 1846-7 [covers period 1847-50]. ARC2001-50 Halse, William, Puke Ariki Collection, Taranaki Museum, New Plymouth, NZ
Location: New Plymouth.
Keywords: primary, mainshock

October 16 [1848]. Violent earthquake. Abt. 1 and 2 a.m.

Hamlin, Rev. James
Source: Hamlin, J. (1848): Letters and Journal of James Hamlin, 1835-1862. MS-0068, Hocken Library, University of Otago, Dunedin, New Zealand.
Location: Wairoa, Hawke's Bay
Keywords: primary, mainshock, aftershocks

[1848] Oct. 16. Monday morning about 3 o'clock [sic] in the morning a very severe earthquake which lasted longer than any I have ever felt at this place before.
[1848 October] 19 Thursday morning about 5 o'clock another earthquake.

Notes:

The Reverend Hamlin settled at Wairoa in late December of 1844. His description of the earthquake's severity contrasts with the Spectator (Oct. 28, 1848) that states that "at Ahuriri [Napier], Poverty Bay and to the north, the earthquakes do not seem to have been felt at all", and the Government Gazette (Dec. 6, 1848) that "the shocks having been felt ... hardly at all in Hawke's Bay". Since the 16 October shock occurred at 1.40 a.m. most people would have been fast asleep and may not have felt anything above the sounds and vibrations of the

prevailing storm. In this respect, it is interesting that Hamlin is 1hr. 20min. late in his timing of the main shock, although he clearly felt [and correctly recorded the time of] the large aftershock at 5.a.m. on Thursday 19th October. He makes no mention of the large shock on Tuesday 17th afternoon, implying that the earthquake was not strong enough to be felt during daytime activities.

Hansard, G. A.

Source: Hansard, G. A. (1848): *The Voyage of the Acheron*. Mss in the National Maritime Museum, Greenwich, England. Acheron Part 3rd (The NZ Section, 1849-50). Transcribed by Sheila Natusch.

Location: Wellington, Akaroa, Cape Farewell

Keywords: primary, secondary, mainshock, aftershocks, building damage, atmospheric effects, casualty, response/recovery, background

[January 1849]

About this time news reached Auckland, that the settlement of Wellington, Port Nicholson, Cook's Strait, had been visited by earthquake, first felt at ... past ... o'clock, on Monday October the 16th 1848. The weather for some days previous had been usually fine, but early on Saturday morning the wind came obscured from the southward and Eastward. On Monday ... following, a distant hollow sound attracted the notice of the inhabitants soon after midday, which swelled at an unusually rapid rate, and almost instantly, the town was convulsed by a terrific shock. The scene is described as most appalling. The crash of houses, and fall of brick walls, the hurrying to and fro of terrified women and children, the incessant wave-like motion of the earth, "produced," says an eye-witness, "a chill at the heart; and a dreadful sensation of sickness more than sufficient to appall the stoutest minded amongst us." ... The convulsion was manifested in three grand shocks, occurring at intervals of about thirty six hours. The chief characteristic of the first was its duration. A French Gentleman at Akaroa stated its continuance at three minutes; the general estimate formed in the town of Wellington was two minutes; the movement was oscillatory, not rapid, unaccompanied by noise and attended by a most remarkable phenomenon, viz. the instantaneous suppression of the Gale which was blowing at the time, and which sprung up again with redoubled fury on the termination of the earthquake, as if it had been "bayed back". The shock was experienced over a space of upwards [of] 200 miles square, and by subsequent comparison of times, making allowance for difference of clocks, it appears to have been felt over the whole of this space at nearly the same moment. It was also distinctly felt at sea, off Cape Farewell.

The second grand shock occurred about 3 p.m. on Tuesday 17th October. The day was beautifully fine, the wind variable but light. A slight report and shock first occurred, followed instantly by a loud roar and regular *tremblement de terre*. The noise came northwards. The earth in some places was moved in waves averaging about twelve inches in height. Some persons were thrown down, partly perhaps from fear. The movement may be defined as a horizontal rapid concussion. Several walls and brick buildings fell and three lives were lost. The duration of this shock was ninety seconds.

The third grand shock took place about 5 a.m. on Thursday the 19th, accompanied by a loud roaring noise, being the most violent of the three. It happened in the midst of a terrific storm

from the S.E., and the same phenomenon observable at the first, was also observable in this, viz. the perfect lull of the wind during the continuance, and its increased violence after the cessation of the shock. It completed the destruction of most of the brick buildings, which had already been abandoned by their owners, neither were there any out of door accidents - as at that early hour, none had "left their beds", and, as previously stated, the wooden houses stood firm to the last. This movement was of the same character as the second; but more intense, and its duration about 90 seconds also. No more violent shocks occurred; but from [the] 16th to [the] 30th of the month, many of smaller importance, perhaps from 10 to 20 in the space of 24 hours, and these gradually became fewer and more gentle. We afterwards frequently noticed trivial movements of this sort on board. In one instance the noise resembled that produced by barrels rolling along the deck.

No sooner did the tidings of this Calamity reach Auckland than Governor Sir George Grey K.C.B. with praiseworthy alacrity, ordered the *Acheron* round to Wellington to afford assistance. We entered Port Nicholson after a passage of about 7 days. As soon [as] the vessel came in sight of the town there appeared unmistakable evidence of the recent Calamity: houses reduced to confused heaps of brick and rafters; others more partially shaken, abandoned by their occupants; two thirds of all the chimnies in the town laid prostrate or more or less twisted and injured; the walls of a Wesleyan Chapel, sent in every direction and the edifice become useless; the Ordinance Store partly in ruins, partly propped up by large timbers. -- Barrack Sergeant Lovell, passing with his two children along the street, was buried beneath a falling wall. The children perished -- the father much bruised and otherwise injured. All buildings injured by the first and second shock, were totally destroyed by the third. Among them fell the Colonial Hospital, and the Goal [Gaol].

In one portion of the town, Lambton Quay, little injury had occurred beyond twisting and throwing down chimnies. Houses built on elevated ground, suffered comparatively less than those on a level -- several small houses of brick having but one story, were only slightly shaken, many remain quite sound; whilst those of greater height are prostrated almost without exception. All wooden houses, small and great, seem perfectly uninjured.

The previous winter had been unusually wet, with little wind. Calm weather is very extraordinary at Port Nicholson - where it seems eternally blowing. This tranquillity of the season is said to be characteristic of the periods when violent and continued earthquakes have occurred in South America.

The principal force of the earthquake seems to have expended itself in this portion of Cook's Strait. At Manawatu, the shock on the 16th was most severely felt. At Akaroa and Port Cooper, Middle Island, the settlers suffered considerable alarm -- at Wairarapa and Taranaki little was felt, and on the East Coast at Ahuriri, Poverty Bay and the North of East Cape, the earthquakes do not appear to have been felt at all. At Cloudy Bay, Queen Charlotte's Sound, and Cape Campbell, the alarm was as great as in Wellington. On Thursday night, the 26th, a long streak of bright coloured light attracted attention as being similar to that seen about 10 days before, for two [or] three successive nights. After remaining visible for about 20 minutes, it suddenly disappeared.

A Calamity of a different nature had ... occurred shortly [after the above crossed out and replaced by] before our ?writing, tending to revive and impress upon the minds of all near, the terrors of the recent visitation. A Merchant vessel called the Sobraon [*Subraon]*, was in harbour waiting for a cargo and passengers on board her -- a great number of the terrified settlers sought refuge from the convulsion ashore, and about 40, dreading its recurrence, took a passage to Sydney. – The Sobraon [*Subraon]* weighed anchor on Thursday the 26, the wind blowing fresh from the south [last line damaged] the outer passage, most generally used, the pilot, tho' warned by the Captain that the vessel would not stay, attempted to take her thro' the inner or Chaffer's passage. In tacking, the ship missed stays accordingly, and struck upon the rocks about 8 p.m. within 100 yards of the shore, as the accident occurred only ... of a mile from the pilot's house, the passengers were safely landed - some taking shelter there, others preferred to walk over the hills back to Wellington, where they arrived at 3 o'clock in the morning.

It seems an almost unprecedented occurrence - that these victims of a terrible visitation, should within a few days after, suffer shipwreck almost within sight of their ruined habitations; - thus in one short week undergoing two of the greatest physical Calamities with which mankind is acquainted. Immediately after the great shock on Thursday, Colonel Gold hastened to the barracks and ordered out fatigue parties of 65th Regiment to give assistance wherever it might be requisite. Under direction of their Officers they were all day employed in clearing away the rubbish of fallen buildings, Sentinels also protected the recovered property from plunder - and gave notice to passengers where danger threatened from the insecure condition of houses still standing.

In some merchants' Stores, a deal of breakage occurred. One tradesman had about £100 of sauces, pickles and preserves, laid prostrate on the floor, where his shelves faced either the north or south, whereas, articles placed towards the east or west, might be partially displaced, but scarcely any thrown down.

A publican observed the hanging lamps of his rooms swinging south-westward or northward. Another found his table lamp thrown down. A billiard table was moved 2 inches from the wall. Near the Ordnance store, and just before it became a ruin, a barrel lying on its side suddenly jumped upright.

The policeman standing on the Hutt bridge before sunrise of the 19th, saw the river greatly agitated, and two or three seconds afterwards, the ground shock beneath his feet. Just then, the bridge received the injury it is now seen to have sustained - the road for a considerable distance rose and subsided like the waves of the sea; the motion gradually approached, and the policeman and his companion plainly felt it pass in an opposite direction towards the North.

A vessel which arrived on Monday from Nelson, reports that the shocks had been severely felt at their place, and it is believed most of the brick buildings and chimneys are leveled with the ground - as in Wellington.

The oyster boat which dredges in Queen Charlotte's Sound, also brings news that the clay Houses and brick chimneys at the whaling settlements there and in Cloudy Bay, have shared the same fate. [p.112 also has marginal cuttings: a letter from Colonial Secretary Alfred Domett, 12 October 1848, about land purchase in the Wairarapa, and an analysis of building damage in Wellington, 30 October 1848.]

When news of the earthquake had circulated to Auckland, the inhabitants subscribed and sent over £500 in mitigation of the presumed present distress. - The money was returned with thanks, and an intimation that the Goodfolks of Wellington being not quite destitute - cd. pay their own damages. -- This flogs everything. - The old and wealthy communities of Europe never practice or dream of such affectation of independence. - When the great and rich Commercial city of Hamburg was partly destroyed by fire some twelve years ago, they gladly and gratefully even [accepted] the smallest donation in aid of that season of distress.

£15000 are said to be the amount of loss in houses, stock, furniture &c. In this, they have petitioned the Government at home. News of their rejection of Auckland's generous contribution must act unfavourably on those with whom rests the discussion of their Case.

Wellington, tho' first seen by us under disadvantages which gave it a rather dilapidated aspect, is a prepossessing little place. Built along a low beach, it resembles some of the smaller watering places of our English coast. And when viewed from a ship's deck, has a clean, neat appearance. Precipitous wooded hills form the background. The valley which lies between that and the town, is intersected by a pleasant winding road, thickly studded with nice looking cottages and gardens, with many pleasant villa residences occupied by the Government employees.

Enclosures of cornland and meadow mingle with the houses upon every local spot, which give to Wellington in early summer a very verdant aspect; but no further clearance of wood can be attempted without materially affecting the beauty of this landscape.

Notes:

This extract was transcribed by Sheila Natusch.

Heaphy, Charles.

Source: Heaphy, C. (1879): Notes on Port Nicholson and the natives in 1839. *Transactions of the New Zealand Institute* 12, 32-39.

Location: Wellington, Rimutaka Range

Keywords: secondary, background, uplift/subsidence, ground damage

The site of the present cricket ground (Basin Reserve) was a deep morass arranged by the surveyors for a dock reserve: after the earthquake of 1848 raised the land, generally, about the harbour, it became drainable.

The land-slips on the Orongo range, to the eastward of Port Nicholson, were not existing in 1839: they are said, and I believe correctly, to have been caused by the great earthquake of 1848. This was thirty-one years ago, and vegetable growth has not yet concealed the clay and sandstone that was then laid bare. As there were no such slips anywhere about Port Nicholson in 1839, it is, I think, a fair deduction that no shake of equal severity has occurred for at least thirty-one years prior to that date.

Notes:

Reference to uplift and landslides occurring during the 1848 earthquake is almost certainly a confusion with the effects of the 1855 earthquake (see also McDowell entry).

Hector, James, Sir

Source: Hector, J. (1890). Reports of Geological Explorations during 1888-89. Government Printer. Wellington, N.Z.

Location: Awatere Valley, Marlborough

Keywords: secondary, faulting, ground damage

p.41

It has till now always been considered that this Awatere earthquake-rent had its origin in and was caused by the earthquakes of 1855. Mrs. Mouat [Mowat], of Altimarlock, informed Mr. McKay that the open rents and fissures yet seen on the surface along the line of the fracture were not produced by the disturbances of 1855, but were caused by the earthquakes of 1848. It may have been as thus stated, but it is equally probable that fresh fractures may have taken place on both dates. Mr. McKay came to the conclusion, and both here and further up the valley obtained distinct proof, that the earthquakes of 1848 and 1855 did but open afresh an old line of dislocation, and produced meagre results compared with the total movement which had taken place along this line.

p.43

Everywhere along the line [of the Awatere Fault] as far as traced there is evidence of recent movements – so recent that it may be credited that some of the rents and fractures have been formed within the past forty or fifty years, as testified to by the older residents in the district.

Notes:

Mrs. Mowat (mistakenly spelt "Mouat" by Hector) was the wife of Alexander Mowat of Altimarloch Station, which was established in 1851. The open rents and fissures seen on the property were thus present prior to 1855 and Mrs Mowat was probably told that they had formed during the 1848 earthquake, possibly by her brother William McRae, who may have been in the Awatere Valley during or soon after the earthquake.

Source: Hector, J. (ed.) (1891): Report of the Committee appointed to investigate and report upon the Seismological Phenomena of Australasia. In: *Report of the Third Meeting of the Australasian Association for the Advancement of Science*, Christchurch, N.Z.

Location: Wellington

Keywords: secondary/reminiscence, primary, mainshock, aftershocks, building damage

p.521

Earthquake of 1848.

The 1848 earthquake has been fully recorded by Sir William Fitzherbert and the late Mr. Justice Chapman. It commenced at 1.40 a.m. on the 16th October, as a violent rocking motion. For three-quarters of a minute it was difficult to stand, but the vibration gradually lessened, the whole lasting for about ten minutes, and during the night a tremulous motion was more or less continued. The direction of the shock was from north-east to south-west. On Tuesday, the 17th, at 3 p.m., another shock of still greater force occurred, accompanied by a loud roaring sound through the earth from the north-east. The tremulous motion was now almost continuous; and on Thursday, the 19th, at 5 a.m., there was a still stronger shock than either of the two preceding. The extreme force was experienced for less than half a minute, but the vibration lasted eight minutes. Slight shocks continued in quick succession, sometimes as many as fifteen in an hour, each lasting only two or three seconds, until the following Sunday, 22nd October; and up to the 18th November five or six daily shocks were felt. Their direction gradually changed more as if they were coming from the eastward.

In the previous years Judge Chapman recorded fourteen earthquakes in 1846, fourteen in 1847, and thirteen in 1848 prior to the date of the great earthquake, which is a larger number than has been recorded in any subsequent year, notwithstanding greater facilities for observations and recording.

p.524

[Extract of Account in *Westminster Review* by the late Mr. Justice Chapman (see *Westminster Review* extract).]

pp. 529-531

Was there evidence of strong vertical shock, or torsion of loose objects?

1848. 17th October. – The house shook, *jerked*, and then vibrated so as to shake all loose articles to the ground ....

The French windows burst their fastenings, and flew outwards. The chimney-piece was cleared of its ornaments, the bottles flew from the table.

Tuesday, 24th. – A very sharp shock while I am writing, at a quarter to 6 p.m. The motion decidedly undulating, and seeming to force up from below. During one of the shocks after 2 p.m. I was standing on the lawn, and I felt myself jerked up. Another similar shock, now, at ten minutes to 6, stronger than the one five minutes ago.

Wednesday. – In a store-room at Alzdorf's Wellington tavern, a large number of short, stout bottles of anchovies were ranged closely together on the floor, and occupying about a square yard. At about 4ft. distance, and south from them, was a cask of beer (twelve or eighteen gallons, I forget which) half full. This cask was jerked up and deposited on the top of the anchovy-bottles without knocking down or breaking one. The motion evidently was along a line, and at the same time undulating so as to produce this upward motion.....Some of the

shocks had a cross-motion with a curious grinding sound underground. During one of these the milk in the pans acquired a circular motion, so as to accumulate the cream in the centre.

Was the area of activity circular or elliptical, and, if the latter, what was the direction of the major axis?
1848. – Not stated. Judge Chapman says, "The shocks commenced at north-north-east and perhaps even north by east; then some were observed to come from north-east and north-east by east, as my house stands; then from east, and latterly from east to east-south-east. The few that I have noted from south-west I attribute to reverberation or some other deception on the ear and senses."

How many shocks? Were first or last strongest?
1848. (1) Judge Chapman says, "Taking the whole of the shocks during the five weeks, only four have occurred of sufficient force and duration to do damage, though at times as many as fifteen have been counted in an hour, and perhaps a hundred and fifty in the twenty-four hours. During the present month the number of shocks has ranged from two or three to seven or eight a day." (2) The shocks gradually decreased in strength.

Did each shock begin with a gentle, slow motion, followed by rapid or intense motion?
In 1848 the shocks appeared to begin suddenly, and gradually to die away.

Hickson, William
Source: Hickson, W. (1848): Memorial and Schedule of Losses by Earthquake, Wellington, 25th July, 1849. qMS-2133, Alexander Turnbull Library, NLNZ
Location: Wellington
Keywords: primary, mainshock, building damage

Sir, I have the honour to send herewith a Memorial of the inhabitants here who suffered by the recent Earthquakes, accompanied by a Schedule of the Losses sustained by each person, and a Government Gazette containing the Report of the Surveyors (dated the 21st of November last) showing the extent of damage done to the various buildings within the town, which I shall feel obliged by your Excellency forwarding to the Right Honourable Earl Grey Her Majesty's Principal Secretary of State for the Colonies; and I shall feel further obliged by your Excellency seconding the prayer of the memorialists for an application for a Parliamentary Grant for their relief. I have attached the Report of the Surveyors alluded to, because it gives a detailed official account of the disasters caused by the Earthquakes. In regard however to the estimated amount of damage in that Report, viz. £15,000, I may observe to your Excellency that that estimate is upon buildings only within the town; and does not include the losses of Merchandise and Household Goods which were to a considerable amount. I deem it necessary to make this observation to remove an apparent discrepancy that exists between the amount of losses stated in the Report, and that of the Memorialists in the Schedule; and which latter, to the best of my knowledge, I am convinced is within the actual amount of loss sustained.

A good deal of time has been unavoidably lost in drawing up the Memorial and getting the various signatures attached to it, and finding that it could not be despatched to your Excellency with a reasonable chance of its reaching England in time for the present sitting of the Imperial Parliament I have delayed forwarding it to your Excellency until the present period. A duplicate of the Memorial will be despatched to your Excellency by the next vessel sailing to Auckland.

I have the honour to be Sir,
Your most obedient servant,
Wm. Hickson.

Chairman of the Committee appointed to draw up and transmit the Memorial.

Notes:

The Schedule of Losses referred to is not included with the Hickson material, although a copy of the Schedule of Building damage (Collinson *et al.*) is included. However, this Schedule differs from the version in the *British Parliamentary Papers Relative to New Zealand*, principally in spelling of the names of people and places.

Schedule of Buildings in Wellington and the neighbourhood which have been damaged by the Earthquakes in October, 1848, referred to in the accompanying Report.

Situation	Proprietor or Occupier	Nature of Building	Damage	Repairs Proposed by the Owner	Observations by the Board
Wellington Terrace	Mr. King Solicitor	Clay house partly faced with Brick, Posts in the Walls the clay Walk strengthened with slips of wood nailed across the Posts about 9" apart.	The brick facing down; the Walk much shattered, part fallen down.	to be pulled down & rebuilt of wood	None of these Buildings are in a public thoroughfare and the Board do not think it necessary that they should offer any observations respecting them.
	Mr. Cridland	One story house, Walls of Clay, with Posts & slips nailed across.	Walls shattered, & partly down.	- Similar -	
	Captain Sharp	One story Clay house, Walls 12" thick, with strong posts 2 feet apart, substantially built.	The whole of the clay work much shaken.	Being repaired with wood.	
	Mr. Bethune	2 story Brick house, with Verandah in front.	Walls cracked.	Under repair	
	Revd. J. O'Reilly	2 story Clay house with thick Walls, very well built.	One of the Gables much shaken, the other slightly; parts of the side walls loosened.	Ditto	
	Mr. Strang	One story Clay house faced with Brick work outside.	Brick work fallen out and the front Wall shattered.	To repair with woodwork.	
Te Aro	Mr. Vincent	One story house part Clay; part weather-boarded.	One side wall, of clay, fallen out one of the Gables also.	Rebuilt with wood.	
	Mr. Plimmer	1 story Clay house, with Posts in the Walls; well-built; part faced with 4½ inch Brickwork outside.	Nearly all the brick-work, down, and the Walls shaken.	Not known.	As these buildings are not in a thoroughfare, and do not endanger the public safety, the Board do not think it necessary to offer any observations.
	Mr. Lowe	1 story Clay house, thick walls, and well built.	Both the Gables down.	Ditto.	
	Mrs. Hendry	1 story Clay house, Walls 12" thick.	All the clay work disturbed	Ditto.	
	Mr. Hawkins	Similar	Part fallen, other parts falling	Ditto.	
	Mr. Forster	Similar	Front Wall and one Gable shattered; other parts loosened.	Repaired with woodwork.	

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Schedule of Buildings in Wellington and the neighbourhood which have been damaged by the Earthquakes in October, 1848, referred to in the accompanying Report. — *continued*

Situation	Proprietor or Occupier	Nature of Building	Damage	Repairs Proposed by the Owner	Observations
Te Aro	Mr. Penny	2 story Brick house, with Brick partitions; Wood bonding all through at every 3 feet.	Front & back Walls thrust out; and Partitions split.	Not known.	
	Mr. Gooder	Small Two story Brick house.	Completely shattered partly down.	Damages are being repaired in Wood	
	Mr. Hutfield	One story Brick house.	Much shaken, Walls cracked over the openings of windows, &c.	Not known.	
	Mr. Masters.	1 story clay house	One side Wall down other parts shaken.	Repaired with wood.	
	Mr. Mudgrowy	One story clay house Posts in the Walls, and strips nailed across	Greater part down.	Not Known.	
	Mr. Bennett	Similar.	Similar.	Ditto.	
	Mr. May	One story clay house well built.	Walls much rent	Ditto.	These Buildings are not in the thoroughfare.
	Mr. Ashdown.	Similar.	Slightly damaged.	Ditto.	
	Mr. Mills.	Similar.	In ruins	To take it down.	
	Mr. Ford	Similar.	Similar	Ditto.	
Sutton Row.	Mr. Gerard.	Well built Clay house, Two-stories.	One Gable, and part of one side Wall, fallen out.	Being repaired in wood.	
Ditto		Several one story houses.	All shattered, parts fallen down.	To rebuild in wood.	
	Military Hospital.	of Clay, detached		To rebuild in wood.	
	Mr. Quin	Several clay houses one story – small.	All more or less shaken, portions fallen down, all unsafe.	To repair some with wood, and take down others.	
	Mr. Villars.	Several small houses, some clay, others Brick.	Parts of the Clay as well as the Brick Walls have fallen, & the whole been much shattered.	Ditto.	
Dixon Street.	Mr. Howe	2 story Brick house and wood bonding.	One Gable down, the rest slightly shaken.	To repair in Wood	
	Mr. Waters	1 story Clay house.	One Gable down.	Repaired with wood-work.	
	Mr. Stoddart.	1 story Brick.	Much shaken one Gable partly down.	Ditto.	

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Schedule of Buildings in Wellington and the neighbourhood which have been damaged by the Earthquakes in October, 1848, referred to in the accompanying Report. — *continued*

Situation	Proprietor or Occupier	Nature of Building	Damage	Repairs Proposed by the Owner	Observations
Dixon Street.	Mr. Blyth,	Well built Clay house, 2 stories, with Brick- work outside.	All the Walls shattered, portions thrown down.	Being repaired in wood.	
	Mr. Catchpool	2 story Brick Flour Mill.	Shaken all over.		Recommended to be taken down.
Willis Street.	Mr. Crowther	2 story Brick	Gables down, side Walls rent.	Taken down.	
	Mr. Wilkinson	2 story Clay house	Front Walls fallen out.	Ditto.	
Manners Street		Wesleyan Chapel large Brick building.	All down.	Site being cleared.	
	Mr. Rhodes	Store, 2 story Brick	Entirely down	Ditto.	
	Mr. Hickson	Store, 2 story Brick	Both Gables down.	To rebuild in wood.	
	Ridgeways' Co.	large building	the side walls completely shattered.	To rebuild in wood.	
	Mr. Waitt	Store, wood, with Brick Gable at S.E. end	Brick Gable thrown out.		Recommended that the Bricks be cleared away.
	Mr. Allen	Commercial Room; 1 story Brick.	Much shattered, part fallen down.	To be boarded on the outside.	Recommended to be done immediately, at present it endangers the public thoroughfare.
		Public House, 1 story Brick and Framing.	Scarcely any damage	Ditto.	
	Messrs. Bethune & Hunter.	Store, Framing & Weatherboarding.	Slightly damaged from the shifting of the packages inside.	To repair.	
	Mr. Fitzherbert	Stores, 1 story Buildings. Framing Bricknogged and Brick boundary wall.	The S. E. & N. W. ends, thrown down and Boundary Wall also.	To put a framework of wood inside, & fix Iron Ties outside bolted to the framework.	Recommended to be done immediately, the thoroughfare is dangerous at present
	H. M. Ordnance	3 story Building, 13½' Brickwork, no wood Bonding, Slate roof.	Gables thrown out N. Wall cracked in several places.	To be taken down.	Ditto.
	Mr. Loxley	Store Brick	Gables much cracked	To take down & re-build Gables in Wood put framework inside to the Walls, with Iron Ties outside.	Ditto.
	U. Bank of Australia	Weatherboard Building 1 story.	The Brickwork of the Safe, much shattered.	To repair.	
	Mr. Langdon.	One story Brick, lined with Wood.	Ends and side down.	Rebuilding of Wood.	

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Situation	Proprietor or Occupier	Nature of Building	Damage	Repairs Proposed by the Owner	Observations
Manners Street.	Mr. Hansard.	2 story Brick.	Completely shattered.	Taken down.	
	Mr. Squib.	1 story Weatherboard, Clay inside.	Similar.		Recommend to be taken down.
	Mr. Moore.	A 2 story house next it, Bricknogged.	The Bricks shaken out of the framing, the woodwork only remaining.		Ditto.
The Beach.	Messrs. Smith & Wallace	Store, one story Brick, no bond timber.	Front thrown forward S. E. Corner opened.	To pull down the S. Gable, and fix 3" planks perpendicularly in the front, 4 feet apart, - tied to the inside, - and 3 horizontal strong pieces outside.	The Front endangers the street, it is therefore recommended that the Repairs be done immediately.
	Mr. Plimmer.	Offices, Col. Govt. 2 stories Brick, no bond timbers.	Front thrust out and Arches cracked.	To put a verandah to the lower story, next the street, and tie the front Wall of the upper Story with Iron Bars, and take down the Parapet Wooden wings.	Ditto.
	Mr. Flyger.	Stores, 2 stories Brick Gables, Wood Front and Back.	The Gables started.		Recommended to be taken down.
	Mr. Christian.	Store, 1 story Brick.	Front Arches cracked.	To put 2" Planks and strong pieces outside, tied to the inside, and Iron Bars to arch.	This Building fronts the street, and endangers the thoroughfare and this Repair is recommended to be immediately done.
	Mr. Swinburne	Two story house, Brick no bond timber nor wood-work inside.	Front Arches cracked	Proprietor does not propose anything.	Recommended that similar Planks be fixed outside, and the inside lined with Wood, and Iron Bars to Arches, in its present state it endangers the street.
	Mr. Hort.	Store, one story, Brick, Wood lining inside.	Front Arches cracked and thrust out.	To fix similar Planks in front tied to the inside woodwork, and put Iron Bars to arches.	Recommended immediately for similar reasons.

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Schedule of Buildings in Wellington and the neighbourhood which have been damaged by the Earthquakes in October, 1848, referred to in the accompanying Report. — *continued*

Situation	Proprietor or Occupier	Nature of Building	Damage	Repairs Proposed by the Owner	Observations
The Beach.	Mr. Armstrong	One story House Brick with Bond timbers.	Front thrust out a little.	To put 4. 2" Planks in the front fixed perpendicularly to the Bond Timbers.	Ditto.
	Mr. Inglis	Store, One story, Brick.	Very little damage.	Repairs done.	
	Mr. Johnson	Stores, One story Brick side walls, boarded inside.	Sides thrust out; Gable end and Roof damaged.	To repair the Gable with Wood and board the inside of the Walls and fix 3" Planks 4 feet apart perpendicularly outside, tied to the inside Woodwork.	Recommended that the repair to the Gable be done at once, at present it is dangerous to the public thoroughfare.
	Geo. Young.	2 story house. 9" Brick. Bond timbers throughout and several wood partitions. N & S. gables badly built, cracked before.	The N. & S. Walls cracked and thrust outwards, front Arches cracked.	To take down the N. & S. Walls, and fix a framework of perpendicular 3" Planks, 3 feet apart and horizontal strong pieces 3 feet apart on the outside of the Front, tied to the Bond timbers, to repair the damaged Brickwork, board both stories inside, and put Iron Bars to Arches.	This Building very much endangers the thoroughfare, it is therefore recommended that this repair be done with as little delay as possible.
	Mr. Grace.	A Two story Brick house small rooms no wood bonding, slate Roof.	The whole house is cracked from top to bottom.	The proprietor, Mr. D. Scott, is willing to pull the whole house down but says he is not able to do it at present.	Recommended to be done at once for the same reason.
	Mr. Tonks.	One story Brick house.	The front and rear gables cracked.	The damaged Brickwork has been pulled down and the Gable boarded.	

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Schedule of Buildings in Wellington and the neighbourhood which have been damaged by the Earthquakes in October, 1848, referred to in the accompanying Report. — *continued*

Situation	Proprietor or Occupier	Nature of Building	Damage	Repairs Proposed by the Owner	Observations
The Beach.	Mr. Taine.	One story Brick store, lined with wood, front boarded.	The rear Wall cracked over the window.	Has been Repaired with Iron Bars outside from top to bottom, and tied to the Woodwork inside.	
	Mr. Alzdorf.	One story, part Brick, part clay, and wood.	Brickwork craced.	Pulled down.	
	Mr. Levin.	Store, one story Brick front.	Thrown forward to S. E.		Recommended that the Brick front be taken down and rebuilt of Wood, immediately, or planked as before suggested, as it endangers the street.
	Mr. Stafford.	One story Brick front.	Front cracked.	To pull down the Parapet, and fix 2" Planks against the Wall outside perpendicularly, connected with Iron straps horizontally.	This Building is also dangerous, and immediate attention should be given to it.
	Mr. Cook.	Ditto. Brick house.	Front and back Walls thrown outwards.	Has been pulled down and replaced with wood.	
	Mr. Brandon.	One story. Brick, badly built.	Cracked at the E. corner.	To pull it down and rebuild it.	Recommended to have iron ties or plank outside, tied to the framing, this building, also endangers the thoroughfare.
Thorndon Flat.	Mr Hornbrook	Store &c. One story, Brick and Clay wattled.	The front and rear fallen out.	Has been rebuilt with wood.	
	Dr. Fitzgerald.	One story, Clay wattled and weather boarded.	Cracked on all sides.	To take it down.	
	Maj. Richmond.	One story, Bricknogged, part weatherboarded outside.	Bricknogging cracked and thrown out, on the S. & E. sides.		Recommended that it be boarded inside.
	Col. Government.	Col. Hospital, Two stories, hollow brick Wall, 14", no Bond timbers, several partitions, a long room in the front, in upper story.	The S. E. Gable thrown out, and front upper story also, and Walls cracked on all sides.	Has been pulled down.	

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Schedule of Buildings in Wellington and the neighbourhood which have been damaged by the Earthquakes in October, 1848, referred to in the accompanying Report. — *continued*

Situation	Proprietor or Occupier	Nature of Building	Damage	Repairs Proposed by the Owner	Observations
Thorndon Flat.	N. Z. Company.	One story, Brick with Wood bonding.	The sides thrown out.	The walls have been pulled down and the Roof supported, and will be rebuilt in Wood.	
	Mr. Clifford.	One story house, Brick, no bond timbers S. E. wing has a Verandah.	N. E. Gable cracked.	Not Known.	Recommended to be boarded inside, and that 2" Planks be fixed against the Wall on the outside, tied to the lining &c. inside.
	Independent Chapel.	One story Brick, wood gate to S. E.	N. Corners thrown down.	Ditto.	Recommended to be rebuilt of wood.
	Mr. Cooper.	Two stories, Brick, small rooms, badly built.	Cracked at the junction of party walls and Arches over windows.	Ditto.	This Building endangers the Street and it is recommended to take it down.
Mount Cook, the Gaol.	The Col. Government.	Two story building of Brick, 18" Walls, and several partitions of Brickwork inside, and Boundary Wall of Brick 9 ft.high.	The N. & S. Gables thrown out, the partition Walls cracked in both stories, and side Walls slightly cracked.	Proposed to be taken down.	
Powder Magazine.	H. M. Ordnance.	One story Brick building Walls 3 feet large buttresses all round, 18" Arch covered with solid Masonry; - A small Magazine of Brick and a Brick Boundary Wall. The masonry in the large building inferior.	The Powder Magazine was cracked before by the Arch giving way, one of the old cracks at the S. E. end opened slightly Small magazine cracked in each Gable, and separated from Boundary Wall – Wall cracked in the Stone foundation on the W. side.		
Porirua	Barracks.	Two story Building Walls 2 ft. thick of Rubble Masonry, and Brick Quoins to all Openings, divided by 4 partitions. Octagonal towers, at the S. E. and N. W. Angles.	Main Wall E side much cracked, Stone and Brickwork separated from top to bottom at every junction. Most of the Arches cracked and the Partitions in the Upper story also. S. E. Tower much shaken.	It has been recommended to the Colonial Government that it be taken down.	

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Schedule of Buildings in Wellington and the neighbourhood which have been damaged by the Earthquakes in October, 1848, referred to in the accompanying Report. — *continued*

Situation	Proprietor or Occupier	Nature of Building	Damage	Repairs Proposed by the Owner	Observations
Kaiwara-wara Public House.	Major Baker.	Two story Brick Building with an Attic and Cellar Wall. several bond timbers, divided into several small Rooms, Slate Roof.	Slight cracks in Wall.		Recommended that the interior be lined with Wood, and that 3" Planks be fixed perpendicularly about 4 feet apart on the outside, connected by horizontal strong pieces and tied to the Roof and Floor timbers inside, and that the bond timberswhich are decayed be replaced with sound timbers.

T. B. Collinson, Capt. R. E., Robert Park, Civil Engineer. Nov. 1848;

Hochstetter, Ferdinand von

Source: Hochstetter, F. von. (1864): *Geology of New Zealand. Contributions to the geology of the provinces of Auckland and Nelson.* Translated from German and edited by C. A. Fleming (1959): Government Printer, Wellington, New Zealand.

Location: Awatere Valley, Marlborough

Keywords: secondary, faulting

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A great earthquake rent, formed in the year 1848 by the great Wellington earthquake, must be a most remarkable phenomenon. It is visible on the north side of the river [Awatere River] from White Bluff, over hill and vale for a distance of many miles, right to Berfeld's [Barefell] Pass. In many places, the fissure is said to be 5 to 6ft. deep and 30 ft. broad and it resembles a canal without water for miles on end.

Notes:

The distance from White Bluff to Barefell Pass is 105 km. Hochstetter's information came from his friend, Julius von Haast. Barefell Pass was discovered and named in 1850 by Frederick Weld, who experienced the 1848 earthquake at Flaxbourne on the Kaikoura coast. It was Weld who gave Sir Charles Lyell information about the 1848 fissure that could be traced for "sixty miles", from the coast inland along the Awatere Valley (see Lyell extract).

Between 26 January and 1 February 2001, R. Grapes (together with R. Van Dissen [GNS] and T. Little [VUW]) made a trip to the headwaters of the Awatere River, Marlborough, to see if there was any remaining evidence of the 1848 rupture reported by Hochstetter to have reached Barefell Pass, SE of Molesworth. The 2001 field survey discovered a hitherto unknown fault trace along the eastern flank of the Rachael Range between the Acheron and Awatere valleys, and this was mapped over a distance of about 12km either side of Barefell Pass. Despite poor exposure because of scree cover, five reasonably well-defined dextral offsets of ~4m (two streams and three ridge crests) were found that suggest displacement during a single (probably 1848) earthquake event. In one place in the Guide Valley the fault gouge is exposed in a slip indicating that it dipped west at 60°. The terrane is such that people (possibly also Weld) driving sheep from the Awatere Valley to Canterbury over Barefell Pass would almost certainly have seen evidence of fissuring caused by the 1848 earthquake. This information was presumably reported to Julius von Haast who supplied the information to Hochstetter about earthquake damage in Marlborough in 1859.

Hollard, Elizabeth

Source: Hollard, E. (ca. 1930): Reminiscences (1842-1930). qMS-0989-0990, Alexander Turnbull Library, NLNZ.

Location: Karori, Wellington

Keywords: primary/reminiscence, mainshock, aftershock

Although I remember the earthquakes of 1848, I was too young to understand the awful portent; and I thought it much more interesting to be taken each evening to Mr. Hughey's big barn instead of being undressed and put to sleep in a common place bed! For some reason the barn was considered safer than a house, and also for the comfort and companionship, some friends would meet, and with no more equipment than blanket and pillow, pass the night on the floor of the barn – rocked by the frequently recurring earth tremors.

Ironside, Samuel Rev.

Source: Ironside, S. (1891): Missionary Reminiscences, No. XXIL: Story of the Earthquake Storms of 1848: City in Ruins. *In: The New Zealand Methodist*, September 12, 19 & 26 1891.

Location: Wellington

Keywords: primary/reminiscence, mainshock, aftershocks, building damage, casualty, ground damage, response/recovery, uplift/subsidence, atmospheric effects, background, tsunami/seiche

[*The New Zealand Methodist*, September 12 1891]

I come then, to the great earthquake storms of 1848, commencing in the early morning of October 16th, and lasting over till well on in the following week. There were, in all, more than a hundred slight shocks during this period, varying in strength from the slight tremor to a smart vibration, and between these, four very heavy shocks, which shattered every brick building in the city save one, on the hill behind Te Aro Flat, the residence of W. M. Penny, Esq. The winter of that year had been unusually mild, and the spring was rich in promise. There was peace in the land. All round were hopeful tokens of a prosperous season. But the month of October brought with it frequent storms of wind and rain. The city was visited by three south-east gales in close succession. The wind blew with hurricane force; the rain descended in sheets. Few houses were proof against the tempests. The gales, however, would have passed away without special notice, but for the awful calamity that succeeded them. There had been slight periodical earth tremors from the beginning of the city, occurring three or four times a year ; but as no damage in particular was sustained, no one felt serious alarm, and for a year previous to October scarcely any shocks had been recorded. But on Monday, the 16th, soon after midnight, at low water, a most violent concussion was felt; preceded by a fearful rumbling noise, as of a railway train driven at full speed. It was difficult, in the awful excitement, to say from whence, and in what direction the dread rumble proceeded. To me it seemed to come from the south-east in Cook's Straits, along Te Aro Flat, and away under the waters of the Port, to Petone and the Hutt Valley. There was no more sleep for any one after that fearful rumbling and shaking. In fact, the earth was unquiet; throbs and tremors were almost continuous. How anxiously we all "wished for the day!" Daybreak revealed to us the city in ruins. The heaviest shock was felt on the flats, and along the beach; on the hills behind the shock was lighter. But the havoc was great: "our holy and beautiful house" was shattered, no longer, materially, at any rate, one of the "the bulwarks of our land," for it was at once officially declared, after examination, to be unsafe, and we had instructions to take down the handsome Grecian pediment on the front, for fear of accident to passers by. We had many companions in tribulation. The Congregational and Primitive Methodist Churches, and all other brick or stone buildings, were wrecked. The Presbyterian Church, on Lambton Quay, being weather-board, was left standing; and, by the kindness of its trustees, became a common sanctuary for all the denominations that could avail themselves of it. Its doors were hardly closed on the Sunday from morning till night. There were services at 9 and 11 a.m., and at 1, 3, 5, and 7 p.m. I think those were the hours fixed upon by the various churches. They would have worshipped together, but there would have been over-crowding of the place. It was pitiable to walk round and see nearly every brick chimney that stood above the ridge board of the house cut off from the ridge as cleanly as though done with a sharp tool, and slewed half

round. Some of the freaks of the giant power on its way through the city were marvelous. At Te Aro, behind our church, where the buildings were comparatively near each other, there stood, in a bye street, Dr Hansard's two-storey brick house, and next it, to the north, a wooden store, fitted up with fragile crockery goods. On the north side of Dr Hansard's house there were stores of drugs, in bottles on the shelves, and the south wall of the crockery shop had shelves filled with Delph ware - not two feet of space between the walls. The doctor's medicine stores were smashed: all the contents of the drugs and chemicals among the broken bottles in an undescribable mixture. On the crockery shop side, not more than two feet apart, scarcely a plate, dish or cup had been displaced.

[According to Ward (1928), Dr. Hansard lived in Manners Street (locality of Bank of New Zealand and Bethune and Hunter's Cattle yard).]

[continued in September 19, 1891 issue of *The New Zealand Methodist*]

Sad Loss of Life

The great shock of Monday morning was followed at the interval of three tides, about thirty-seven and a-half hours, on Tuesday afternoon by another; and, after a like interval of some thirty-seven hours, by perhaps the most terrific of all, on Thursday morning about five. "The earth shook and trembled" more or less during the whole intervening space of time from Monday to Thursday; and yet another concussion took place on the following Tuesday afternoon, when gradually *terra firma* was restored. There was naturally great alarm among the people: "All faces were turned into paleness." Some of our friends, with my dear wife and myself, took refuge from our wrecked homes with Mrs. Watkin and family in the Mission-house, a weather-boarded one, in Manners street. Mr. Watkin was, fortunately for his own comfort, away in Auckland, at a church opening or anniversary, to which he had been specially invited, so he was out of it. But he had anxiety enough when he heard of the desolation of Wellington, and was powerless to aid us. There were seven families of us in the Mission-house, thirty-two persons in all, so I felt that my responsibility was great. The provisioning of this large number was not of much consequence at the time, for there could be but little cooking, and none of us were able to do justice to a meal, however well prepared. In fact, the physician in the neighbourhood was concerned for all on that account. He directed me to procure some stimulants, which, as he said, were absolutely requisite; and see that everyone in my charge took some occasionally. I went to the stores of one of our leading merchants and explained our position. He took me into his shattered storeroom, where was indeed a wretched sight: broken bottles in scores lying about, their contents mixing together and covering the floor. "You are quite welcome, Mr. Ironside, to any - all - that you want. I shall make no charge." So he kindly sent his man up to the Mission-house with a dozen of the bottles that had so far escaped the wreck; and I, under orders from the doctor, served out small portions every two hours. My brother missionary from Waikouaiti, Mr. Creed, an old Hoxton College chum, a fellow passenger in the *James*, with his wife and child was in Wellington on a visit at the time; so that he and they shared in our alarms and anxieties. I was glad that he was with me, to help me in may responsibilities and perplexities. On the Tuesday afternoon, when the second shock came upon us, he was meeting one of the classes in the study; that shock, which still further wrecked our church, came while the class was in fellowship. It was indeed a perilous time: the big eastern wall of the church, only some sixteen feet from the

room in which the meeting was held, vibrated from side to side in an alarming degree; if it fell it would endanger the life of every one in the house. I was outside, consulting with the builder and his men, who were taking down the large stones of the pediment in front. Some of them were on the scaffolding; I trembled for their lives, my heart was in my mouth, as they swayed to and fro with the building. Very providentially the walls and roof maintained their position, so the dear women at worship were preserved, and the men on the scaffold were able to descend from their frightful position. Singular to say, I had written out a notice for the weekly paper, inviting the people to worship, joining in prayer for Almighty help and guidance, and thanksgiving that, through God's infinite mercy, no injury to life or limb had been sustained. I was on my way to the office at the foot of Willis Street, with this advertisement, and in front of our church when the fearful shock I am writing of occurred. Then came the heaviest calamity. Mr Lovell, Barrack Sergeant, in charge of the commissariat stores in a large brick building on the beach, was there, looking after the Government property under his care, when the shock occurred. He had two of his dear children with him: the youngest a girl of four, and another a fine little boy of seven. The shock was so sharp and sudden, that, before they could escape, a brick wall fell upon them, and buried them under its ruins. The girl was instantaneously killed, the boy died the same night; Mr Lovell lingered for a day or two, and then died, leaving a widow and two young children to grieve over their sudden and unexpected bereavement. He was a good Christian brother, and a most acceptable local preacher, often filling our Manners-street pulpit to the profit and edification of the people. He was fully prepared for the summons which came so unexpectedly. He had preached at Manners-street the previous Sunday a most excellent sermon from St John xvii, 4; "I have glorified thee on the earth; I have finished the work which thou gavest us to do." A most fitting theme for what proved to be his last sermon.

[Continued in September 26, 1981 issues of *The New Zealand Methodist.*]

Further particulars of the Earthquake Storms of 1848. - Fast Day. - Personal Experiences. - Fissures in the Land. - Upheaval. - Refugees wrecked at the Heads, on Barrett's Reef.

In view of the general calamity, the wide-spread feeling of danger yet imminent, there was a consensus opinion that the city should be called to fasting, prayer, and humiliation before God; recognising the truth in the 100th Psalm, "*He* can create, and *He* destroy."

The Lieutenant-Governor, Edward John Eyre, Esq., readily acceded to this view, and, with his authority, a "Day of Fasting and Humiliation" was proclaimed, and published in the Gazette. Friday, the 20th, was the day fixed upon: it was very generally observed. Religious services were held during the day in the city and all round the outskirts. The central service was held under the auspices of the Evangelical Alliance, at the Scotch Church, on Lambton Quay, in which all the Nonconformist ministers and congregations joined. The services were held outside, for the church would not hold more than one-third of the great gathering. Besides, there was a dread of congregating in numbers within any buildings at the time. Great seriousness and earnestness prevailed. The subject of one of the addresses was Jonah iii., 9, and the faith of the worshippers rose high as the service proceeded. The glad, restful feeling prevailed: "God WILL turn and repent," &c. It was a time of Divine consolation and blessing. Under the management of the Alliance, similar services were held at the Hutt, at Karori, at

Johnsonville, and on board the *Sobraon*, [*Subraon*] lying in the harbour crowded with refugees, who, fleeing from the peril, had taken passages in her to the other colonies. The Father heard, blessed, and comforted his children. It was considered providential that the heaviest shocks had occurred at low-water tides. The vagaries of the inflow and receding of the waters caused no doubt by submarine action, were remarkable. There was a fear lest we might have a tidal wave, submerging all the low flats; so great numbers bivouacked on the Western Hills. It was a melancholy, unique, and, withal interesting sight. Scores of people, old and young, built large fires, and swarmed round them; spending the live long night in singing, prayer, and serious talk. All were glad when day broke, and revealed that all things continued as they were. Our friends who fled from the danger on land, sacrificing their little all in most cases, simply passed from one peril into another, for the *Sobraon*, [*Subraon*] in which they sailed away, was wrecked on Barrett's Reef, at the entrance of the port. They realised the old Latin proverb: "*Incidit in Seyllam, qui vult vitare Charybdim.*" Their lives were mercifully spared; but they lost what little they had taken on board with them, and they came back discomfited and dispirited.

There was an upheaval of the land on the shores of the harbour, and in places along the coast. This rendered it possible, by a comparatively small outlay, to build a sea wall, keeping back the tides, and so recover a good many acres that had been covered with water at high tides: and large merchants' stored, Government offices, with number of houses, have been erected, and fine streets formed out of the reclaimed land. The earthquakes were not, therefore, an unmixed evil. Several extensive cracks and fissures were found in the land when the storm subsided. I remember putting my walking stick, a big stout one, into a fissure a little west of Barrett's Hotel. I held the stick by its knob, and let it fall to its entire length, but could feel no bottom; I moved it to and fro, but it was empty space, so far as my limited means of examination could determine.

I hope I have not wearied my friends with somewhat lengthened detail of "the visitation of God" on Wellington, forty-three years ago. To us, who lived through the tribulation and anxiety of the period I have been writing of, the event would appear to justify any amount of detail in narrating the story. I have mentioned the name of my old Hoxton College friend and brother missionary to the Maoris, Rev Charles Creed. I wish I had longer space to tell of his most valuable services. He laboured indefatigably; his knowledge of the language was thorough; his Maori sermons were among the best ever preached. He won the hearts of our New Zealand people wherever he went. Few equalled, but none excelled him in this respect.

Notes:

There appears to a confusion with the effects and uplift that occurred in the 1855 earthquake.

Iveson, Ben

Source: Iveson, B. (1954): Article: "Severe earthquakes in early days brought scenes of terror for settlers in new land". *In*: *Wairarapa Times-Age*, March 11, 1954.

Location: Wellington, Wairarapa.

Keywords: primary/reminiscence, building damage, uplift/subsidence, ground damage

But the most severe earthquake in the memory of the Maoris and early Wellington and Wairarapa settlers was in 1848" continued Mr. Jackson. "Considerable damage of every description was done and the early colonists thought the crack of doom was upon them. Houses were demolished, chimneys were thrown over in the settlement, the water in Wellington Harbour rose several feet and fissures appeared in the earth and land slips were to be seen on every hand....

Notes:

Mr. H. H. Jackson (afterwards called "Stonestead" Jackson from the name of his Tauhaurenikau property) arrived in Wellington in 1840 and was one of Greytown's founders. His reference to the water in Wellington Harbour "rising several feet" during the 1848 earthquake is probably a confusion with the effects of the 1855 earthquake.

Jackson, Henry

Source: Jackson, H. – (& E R Foster)(1868): Plan: W131; Date: 1868-1869;Locality Orongorongo, Wellington, Features: Survey Data, Topo, Bush; Scale: 20 ch- 1 inch; Prepared by: H. Jackson & E R Foster [Department of Survey and Land Information, Series 997 Archives New Zealand, Te Whare Tohu Tuhituhinga O Aotearoa, Wellington Office, NZ.] AAFV 977, W131.

Location: Palliser Bay, Wellington, Wairarapa

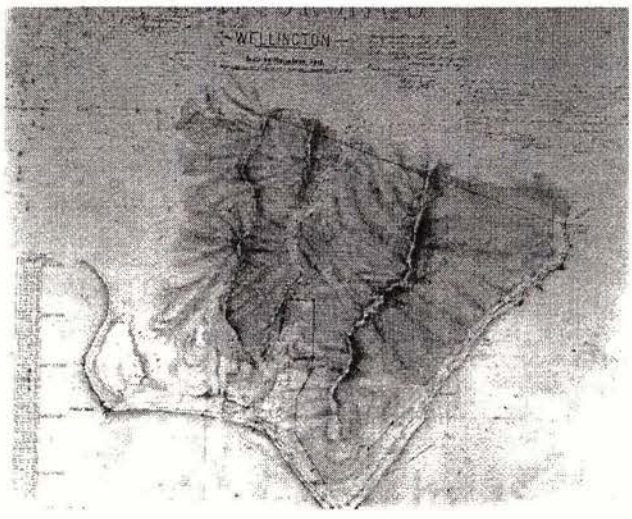
Keywords: secondary, uplift/subsidence

Map of the southern North Island coast from Fitzroy Bay around Turakirae Head to Windy Point, Palliser Bay. The map shows a blue line running parallel to the coastline near Turakirae Head that is labelled: "High Water Mark previous to Earthquakes of 1848 and 55".

Notes:

The position of the blue line runs exactly along the line of the beach uplifted in 1855 (Grapes & Downes 1997). Reference to the fact that the beach was uplifted in 1848 as well as 1855 is interesting, but is uncorroborated by any other evidence.

Grapes, R., Downes, G. (1997): the 1855 Wairarapa, New Zealand, earthquake – analysis of historical data. *Bulletin of the New Zealand National Society for Earthquake Engineering 30:* 271-368.



Jolliffe, John.

Source: Jolliffe, J. (1855): The diary of John Jolliffe, R. N., written during the voyage to New Zealand 1851-56 [as Staff Surgeon on board H.M.S. *Pandora*]. *In:* New Zealand Journals 1851-1856. Micro-MS-130, Reel 1, Alexander Turnbull Library, NLNZ.

Location: Wellington, Wairau Valley, Awatere Valley, Marlborough

Keywords: secondary, tsunami/seiche, mainshock, ground damage, faulting

January 23 Tuesday 1855

... This tidal phenomena [the tsunami that occurred in Lambton Harbour, Port Nicholson during the 1855 earthquake] never occurred before during the previous shocks not even during the severe ones in 1848.

January 30th Sunday 1855.

The earthquake of 1848 was severely felt throughout the Wairau Plains and the ground was there torn up and displaced in a direct line for 85 eighty-five miles in some parts as wide as a canal in other places only a fissure in the earth of various depth.

Notes:

It is clear from parts of the journal not transcribed here that Jolliffe gets his information from conversations in Nelson when he visited there after the 1855 earthquake. At the time this extract was written, the Wairau Plains referred to the area encompassed by the Wairau and Awatere Valleys, and hence the line of displacement could be in either valley. Other accounts indicate that it was along the Awatere Fault (see Hector, Hochstetter, Jones and Lyell entries).

Jones, Morton.

Source: Jones, M. (1855): 1855 Journal, Vol 1. qMS 1076, Alexander Turnbull Library, NLNZ. Original in Mitchell Library, Sydney.

Location: Wellington, Awatere Valley, Marlborough

Keywords: secondary, faulting, ground damage, mainshock

I am told, in 1848 which shock by all accounts was not nearly as severe as the present [1855] one....

This [1855] earthquake exceeds in intensity very much by all accounts that of 1848 which at the time of its occurrence was regarded as extremely awful....

The Awatere during the 1848 earthquake suffered very much: a huge fissure having been made upwards of eighty miles in length resembling a macadamised road and about the same width.

Notes:

This last entry refers to the line of the Awatere Fault (see Hector, Hochstetter, Jolliffe, and Lyell entries). Like Jolliffe (q.v.), Jones seems to get his information in Nelson during his visit there after the 1855 earthquake. Unlike Jolliffe, Jones specifically refers to the fissure being in the Awatere Valley.

Kearsley, R. J.

Source: Kearsley, R. J. (1848): Letter dated 28th February 1848 written by Jas. Kearsley to his brother "Bill" (William Kearsley). In: Documents relating to the Kearsley Family, MS Papers 5662. Alexander Turnbull Library, NLNZ

Location: Wellington

Keywords: primary, background, response/recovery

I wrote home a short time since stating if you were not doing very well to come out here and informing you how you might obtain a passage to Otago and after we had the severe earthquakes in October last, I wrote to say do not think of coming out, but that was written during the time of the earthquakes were about and me excited thinking every moment would be our last but they have pretty well ceased, we get one now and then but I think there is nothing to be feared. The people have all recovered and things are going on briskly as ever and should you feel the inclination from trade being bad at home, I still say you could not do better than make application for a free passage to the New Zealand Company and no doubt they will give you one...."

King, Thomas

Source: King, T. (1848): Journal 1842-1849. In: King Family Papers, MSX–4343, Alexander Turnbull Library, NLNZ

Location: Wellington

Keywords: primary, mainshock, aftershocks, building damage, casualty

16 October

[At Wellington] At about 1.40 am an earthquake of considerable violence took place. I was awakened and much terrified by the shock which lasted about twenty seconds. I dressed myself and with Mary and Polly [their daughters] sat by the kitchen fire till day dawned. From the first to 8 o'clock, 42 shocks were felt. Many houses and most of the chimneys have fallen. My chimney is shaken from the roof upwards.

17th October

A fine day, but of changing character. Between three and four shocks felt, the second, a violent one. Town was enveloped in the dust of fallen bricks. One man and one child were seriously [injured] and one child killed.

Notes:

The King family sailed for New Plymouth aboard the Carbon on Sunday 29th October and there are no further references to earthquake shocks after the 17th October. The location of King's house is unknown except that he leased a piece of land from Dr. William Dorset for £5 a year and paid a builder £91 to build a cottage.

Lee, W

Source: Lee, W. (ca1878): Extract from a lecture on "New Zealand" (possibly to the Geographical Society, London), sent by a "correspondent" to the Hawke's Bay Herald (date unknown) where it was printed under the title "A Wellington Earthquake Thirty Years Ago". In: scrap books held at the Wanganui Museum. Obtained by A. G. Bagnall and sent to George Eiby (Geophysics Division, Wellington), 2 March 1983.

Location: Wellington, at sea, Hutt Valley

Keywords: primary/reminiscence, response/recovery mainshock, aftershocks, building damage,

... About four o'clock in the morning I was aroused from my slumbers by a violent shaking of the bed on which I lay.... Putting my head over the side of my bunk and looking down into the room below, I could perceive that there was some motion. In a few seconds, down came the chimney with a crash. I was instantly down my ladder and outside the door, and was forced to join my shivering and half-naked companions. I shall never forget the feeling of that moment as I gazed on those grand old mountains, with all their magnificent forests rolling to and fro like drunken men. My mind was completely crushed under the sense of my own nothingness, and lay like a worm on the ground, stupefied by the awful display of the omnipotence of Him who could thus cause the foundations of the earth to shake. The tremulous motion of the earth continued for twenty four hours. It was sometimes so slight as to need care to discover it; but now and them was heard underground as a growl like a roar of thunder, and then the motion would be so violent as to compel us to lie down on the ground, or hold by some tree or post. Presently we took refuge on our schooner. Strange to say we felt the shocks as much on the sea as on the land. The force of the earthquake did not seem to be deadened by the water, and our little vessel trembled like a leaf. At Wellington we found the whole town in confusion. One wall of the brick barracks had been shaken down, and several houses in the place were more or less dilapidated, while there was hardly a chimney standing. A solemn fast had been proclaimed, and the people were as sober as if just escaped from some fearful fire. The Colonial Government learned that the country would be depopulated, and they laid an embargo on the vessels in port. But the terrors of the earthquakes exceeded the terrors of the law, and a number of men chartered a vessel to carry them from a place apparently doomed to destruction. For several weeks scarcely a day passed without an occasional shock. We returned to our home, and took up our dwelling in one of the cow sheds, the walls of which, being composed of a large pile of timber driven into the ground, could not be shaken down. We soon became accustomed to this awful phenomenon, and then at length began to turn the shocks to account in the duties of our business. This in falling timber, it was our custom to cut about one-third away in the tree on the side we wanted it to fall, and then with an axe chop away the wood above the slit, till we had made a large sloping gash, called a scar; the support being to a great extent withdrawn from this side, we had but to saw a little way behind, when it would come tumbling down at the first shock of an earthquake. I have seen as many as fifty or sixty giants of the forest standing thus, half sawn through, waiting to be shaken down; and exhibited one of the most extraordinary instances of the force of habit in weakening impressions of terror that I have ever experienced.

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Notes:

W. Lee was a member of the Geographic Society, London, and his lecture was presumably given in 1878. He was clearly not in Wellington at the time of the first earthquake on the morning of the 16th October, but appears to have been living in a hut with others engaged in tree-felling, possibly in the Hutt Valley and near the river where their boat (a small schooner) was moored.

Leigh, Reverend Samuel.

Source: Strachan, Alexander (1853): *Remarkable Incidents in the Life of the Rev. Samuel Leigh*. Hamilton, Adams and Co., London. 528 pp.

Location: Wellington

Keywords: secondary, aftershocks, building damage, casualty, response/recovery

p. 471.

Many of the buildings in Wellington were thrown down, but no lives were lost. On the 15th [sic] the earth was in motion all day; but in the afternoon, a shock much more violent than the former one was experienced. Nearly every brick chimney in the town was thrown down; and the buildings which had survived the former shock were shattered and rendered untenantable. 'I was never so impressed', said an eye-witness, 'with the almighty power of God, as when standing in the streets, and beholding the large massive brick buildings toppling over in every direction.' A class was being met in the mission-house at the time; and while the people assembled thought themselves secure, the east gable of the large chapel was vibrating over their heads in the most frightful manner. Through God's mercy it did not fall, or they must have been all crushed to death under the ponderous mass. One of the local preachers, and two of his children, who were passing a store-house at the time it fell, were buried in the falling materials ... A still more alarming shock took place on the 19th, which laid the whole town in ruins. If the houses had been brick or stone, two or three stories high, the loss of life would have been immense. The mission families being driven from their houses, erected a large tent, which afforded some shelter from the wind and rain that descended upon them with great violence. One thousand pounds' worth of mission property was destroyed by these successive shocks.

Lensen, Gerald

Source: Lensen, F. (2000): Letter to R. Grapes dated 26 May, 2000. Original in Rodney Grapes' personal files. Copy held at Institute of Geological & Nuclear Sciences.

Location: Awatere Valley, Marlborough

Keywords: background, faulting, ground damage, uplift/subsidence

Rodney Grapes,

Some comments on the Awatere Fault 1998 paper[*], the following:

At Saxton River (p.395) you throw doubt on my statement about the displacements on the lowest river terrace still only about 0.3-0.4 metre above river level [Saxton River] to be the record of the 1848 fault movement.

We both agree that the Awatere Fault moved that year, but your reasoning that at the Saxton River the fault did not cause the displacement noted by me in my 1973 publication [**] is invalid.

You based your statement on McCalpin 1996 [***] inferred from trenching data ages between 522-597 yr. BP.

While I have no argument about those dates they do not prove that the fault at Saxton River did not move in 1848 for the simple reason that a 150 yr. BP age is too young to be measured by C^{14} dating methods. Hence the absence of dateable evidence does not exclude its movement that year.

As I have walked the Awatere fault for most of its length, the most clear evidence of the 1848 displacement I found was at Saxton River.

Gerald Lensen

*Grapes, R., Little, T., & Downes, G. (1998): Rupturing of the Awatere Fault during the 1848 October 16 Marlborough earthquake, New Zealand: historical and present day evidence. *New Zealand Journal of Geology and Geophysics* 41, 387-399.

**Lensen, G. J. (1973) Guidebook for Excursion A10. *In*: Field-trip guide for the Ninth Congress of International Union of Quaternary Research, University of Canterbury, Christchurch, New Zealand.

***McCalpin, J. P. (1996): Tectonic geomorphology and Holocene paleoseismicity of the Molesworth section of the Awatere Fault, South Island, New Zealand. *New Zealand Journal of Geology and Geophysics* 39, 22-50.

Notes:

Lensen's statement that the 1848 event cannot be dated by ^{14}C methods is correct. In addition to the displaced river channel (0.3m vertical; 6 m dextral) near present day river level, the Awatere Fault scarp on the upper terrace on the true left side of Saxton River does have a "fresh" appearance in that there is an open fissure that can be traced for a hundred metres or so along the middle part of the fault scarp. This fissure undoubtedly represents the latest movement on the Awatere Fault. If this was not in 1848, then on the basis of McCalpin's ^{14}C dating evidence the fissure formed during an earthquake sometime between 522 –597 cal. years B.P and has remained open since that time.

Ludlam, Alfred

Source: Ludlam, A. (1855): Letter to Sir David Monro, dated March 8 1855. *In: Upper Hutt Leader*, November 20, 1990.

Location: Wellington

Keywords: primary/reminiscence, building damage

... But upon going round Wellington, and comparing the damage of 1848 with the present damage [from the 1855 earthquake], I should say the amount is very much less than in 1848. This may be easily accounted for by the fact that there were not nearly so many brick houses and those that were are all strongly bonded with wood and iron. A great many that suffered with the previous shake, this time are uninjured.

Lyell, Sir Charles

Source: Lyell, C. (1856).Correspondence from Sir Charles Lyell to Walter Mantell. Originals held at Kinnordy House, Kinnordy, Scotland.
Location: Marlborough, Wellington
Keywords: *secondary, background*

19 May 1856, 53 Harley Street, London
My dear Sir,
I have seen Mr. Weld and have obtained a good deal of information about the earthquakes of 1848 and 1855 as they affected the Middle Island.

Source: Lyell, C. (1856): Notebook 213. *In:* Notebooks of Sir Charles Lyell. Originals held at Kinnordy House, Kinnordy, Scotland.
Location: Marlborough, Wellington
Keywords: *secondary, mainshock, aftershocks,*

p. 54
In 1848 first shock at 2 A.M. or in the night & the 2d 3 P.M. The 3d about 5 A.M. 2 nights after.

Were the pictures turned round during the 1848 earthquake?

p. 55
36 hour intervals between shocks of 1848

p. 83
Earthq. of Oct. 18th 1848 occurred at 3 o'ck.

Notes:

Notes written by Sir Charles Lyell, based on discussions with A. F. Weld [F. A. Weld], Chiccock House, Bridgport, Dorsetshire.

Source: Lyell, C. (1856b): Sur les Effets du Tremblement de Terre du 23 Janvier, 1855, à la Nouvelle Zélande. *Bulletin of the Geological Society of France, Series 2, 13*: 661-667. [Translated into English by Geoffroy Lamarche, NZ]
Location: Awatere Valley, Marlborough
Keywords: secondary, faulting

Mr. Weld, who was in the Middle Island during the previous earthquake in 1848, tells me that at that time there was produced a big crack in the high range of mountains, from 1000 to 4000 feet in height, which extends to the S. from the White Cliffs in the Bay of Clouds.... The crack of 1848 was not, on average, more than 18 inches in width, but was remarkable on account of its length, for it has been traced by Mr. Weld or his friends, and some people worthy of trust, over an extent of 60 miles, in a N-S direction, on a line parallel to the axis of

the range. Whether there may not have been some uplift to the formation of the crack is what one has not been able to establish.

Source: Lyell, C. (1868): Principles of Geology Vol.2, 10th ed. John Murray, London.1868.
Location: Marlborough, Awatere Valley
Keywords: secondary, faulting

p.89
Mr Weld was in the South Island during the previous earthquake of 1848, and he informed me that a great rent was then caused in a chain of mountains varying in height from 1,000 to 4,000 feet, which run southwards from the White Bluff in Cloudy Bay and may be considered a prolongation of the Remutaka [Rimutaka] or Tararua chain above alluded to (see Map [not included here]). This fissure of 1848 was not more than 18 inches in average width, but was remarkable for its length, for it was partly traced by Mr Weld and partly by observers on whom he could rely, for 60 miles, striking north-north-east and south-south-west in a line parallel to the axis of the chain.

McDowell, James
Source: McDowell, J. (ca.1910-11): Letter to the Editor of Evening Post? (published in Wellington). *In:* Family scrapbook of Alistair Stuart of Gladstone, Wairarapa. Wairarapa Archives, Masterton, New Zealand.
Location: Wellington, Wanganui, Canterbury
Keywords: secondary, aftershocks, ground damage, faulting, atmospheric effects, uplift/subsidence

To the Editor,
Sir,
...Mr. Valentine said it was a beautiful sunny day and the 65th Regiment was on full dress parade, where Fitzherbert Terrace now stands. The regiment was in line for inspection of arms. The band, of which he was one, was stationed opposite the regiment playing, when without warning he noticed that the steady line of soldiers started to go up and down as if they were in heights and hollows, and the bandsmen fell sprawling in all directions. On rising they again fell, and all the regiment became very seasick. That ended the parade. The earthquakes continued - none so heavy or disastrous as the first one, and they finally ceased in three to four months. The results of the great shock were too many to occupy your space within a letter, but three of them so impressed the settlers that frightened ones left Wellington for more solid places. The items causing their departure were: - Two fissures or long deep openings in the earth's surface. One extended from behind the Oriental Bank now the Albert Hotel across Willis Street and through where the Duke of Edinburgh Hotel now stands, and on into the harbour as far as the eye could trace it. It was wide, and long planks had to be placed across the wide fissure. The other fissure was beyond Pipitea Point, and went up Tinakori Road and on into the harbour. As time wore on those fissures either closed or naturally silted up.

Across the harbour the great damage was done. Up to that time the harbour was wooded all around, but the earthquake changed the appearance as, all the hills were split open by the upward thrust and the front parts fell into the harbour. The high mountains behind Wainuiomata were split, the fronts falling, all the trees and bush being covered up, leaving an almost perpendicular face in places and very ugly scarred and rugged faces. The writer remembers how ugly and desolate they looked 44 years ago. Since then time has partially covered their nakedness with growths but some of the scars still remain.

The late Mr John Plimmer wrote what he saw off a ladder on a building on which he was working when the earthquake occurred, the whole Te Aro Flat undulating and waving like a field of oats in a wind. The earthquake extended north and south; a large crack or fissure opened in the river at the town of Petrie, now called Wanganui, and the late Mr Isaac Plimmer told me that he was working at a sawmill for his father on Mount Victoria, and at night he saw a great flare of fire in the sky in the south, and that there must have been an eruption in the direction of the Cheviot Hills. It was found out later that the hills from Port Robinson to Cheviot had been split and one side subsided in places for five or six miles.

Notes:

Extracted from a letter written on August 9th in response to a lecture given by James McIntosh Bell, Director of the New Zealand Geological Survey, on Wellington Harbour and the earthquake risk to the brick buildings of Wellington. The writer draws on a description of the 1848 earthquake given to him by a Mr. John Valentine of Oriental Bay, Wellington. He describes Mr. Valentine as "one of our citizens of a ripe old age approaching nearer to ninety than falls to the lot of many, having lived in the reign of George the Fourth, William the Fourth, Queen Victoria, and Edward the Seventh, and with his regiment helped to suppress the French rebellion in Canada in 1835, and enjoyed whatever joy is to be found in earthquakes in Bermuda also riots about Dan O'Connell in Ireland, and other pastimes before sailing to the Pacific and the then very young colony of New Zealand".

There is probable confusion with the effects of the 1855 earthquake with respect to the references to fissures and landsliding.

Reference to ground deformation between Port Robinson and the Cheviot Hills is interesting and may be a general reference to the inferred earthquake fissures described north of the Waipara River described in the Warren Adams extract.

Source: McDowell, J. 1912. Letter to the Editor entitled: "Forests and Beatifying" dated 12th July, 1912, possibly in the *Evening Post*. Cutting in Scrapbook at Wellington Public Library, p.45.

Location: Wellington, Wairarapa

Keywords: secondary, ground damage, aftershocks

... When the earthquake started in 1848 it continued at intervals for some time, and caused great landslides and earth slips, which largely denuded the hill faces of the eastern mountains across the harbour, leaving behind ugly scars. The second earthquake, in 1855, was even more destructive than the first one... .

Notes:

McDowell got his information from "the late Mr. Isaac Plimmer, who was working in a sawmill of his father's on East Wellington, on the slope of Mount Victoria" (see Heaphy entry).

McKain, Douglas

Source: McKain, Douglas. Transcript of journal entry by Robina McKain for October 1848 earthquakes. Micro-MS-0041; Alexander Turnbull Library, NLNZ

Location: Wellington, Wanganui

Keywords: primary/reminiscence, aftershocks, building damage, response/recovery, ground damage, atmospheric effects

The Earthquakes

In October 1848 several shocks of Earthquake were felt all over the Cooks strait district, damaging a good many of the few brick structures existing(?). After the first of these, I was standing on the barrack hill on a great pile of the blue gum timber we had got from Sydney, and contemplating the town gaol, which, of solid brickwork, then stood on the hill: - a sharp earthshock passed under out feet, rattling the timber pile as if a railway train had gone through the hill. The Colonial gaol was cracked by it and also a .....? Store(?) house in the town, used by the ordnance...? The feeling of the earthshake and the damage done, decided the question of construction, ...? beyond all argument.

I was asked by the Colonial Government to report (in company with a local Civil Engineer) on the Earthquake. All we could discover (from the lie of the brick chimneys and walls thrown down) was that the direction of movement was from SE to NW. This was also the impression one felt at the time of the shocks; the first intimation was always a sudden tremulous movement of the earth accompanied by something like a sound; as if some fluid was forcing its way with immense velocity through the earth at a great distance below, and travelling in a fixed direction. This was followed after a perceptible interval, by an oscillation as if the fluid was recoiling from the movement, and recovering its equilibrium; the earth being also moved by its activation. It was this oscillating action which did the most damage; and the more damage was done on low alluvial ground than on rocky hills, showing that it was merely the mechanical action of some deeper force, and not a burst of molten material like in a volcano.

The Lieut. Governor, Mr. Eyre, who was a nervous man – though very determined as he showed afterwards in Jamaica – got up in the night (the first shock was in the nighttime) and went about with his staff looking for cracks in the ground with a lantern of which there were a good many in the soft soil, but of no great size. He even penetrated into the bedroom of the Colonel commanding the Troops, for support; but that gallant officer did not feel it part of his duty to turn out of bed to meet such an enemy; and he was reported to have told the Lt. Gov. that he shook his own bed more than any earthquake did.

I was at Wanganui at the first great shock: I jumped out of bed and by the time I got to the door, the oscillation had begun, and knocked me against the side posts. Waiting for further motion(?) and perceiving none I went to bed again.

The blockhouse in the stockade at that station was just completed, and a sentry had been put over it: dozing peacefully in fancied security from all warlike dangers, he was roused by feeling a novel enemy shaking the ground under his feet; and on looking round to see where he was, he saw the blockhouse oscillating about, as if with the intention of going the rounds itself; he took to his heels like a man and rushed into the guard hut as if he was followed by a demoniac building.

Even an earthquake however has its benefits to some people, like its natural colleague the wind. My friend Dillon Bell, met me in Wellington, some days after with a radiant face: "The Earthquake has given me a wife"[*] says he. He had been for some time the most favoured of the many admirers of the very pretty daughter of a Jewish merchant living for the time at Wellington: and he happened to be staying in their home at the time. ..? the shock came in the middle of the night, the scene of course was touching. Everybody male and female rushing out of their rooms and seeking the open air as the only place of comparative safety. On such occasions the more tender members of society naturally look to those who love them best for protection. "And after the excitement was over" says he – "I found that however shaken the world might be I was fixed for life".

There was some idea that the earthquakes followed after unusual rain; but I don't think that theory was maintained by experience. There should have been a great many more earthquakes in NZ if it depended in any way upon rain.

Notes:

* See Anon extract.

This extract is similar to parts of the account given by Captain T. B. Collinson who was also in Wanganui during the first shock and then travelled to Wellington. He also describes standing on Barrack Hill near the Colonial Goal (possibly at the same time as McKain) and describes the effect of the aftershock referred to - like a railway train rushing under his feet.

The civil engineer mentioned by McKain is Robert Park who, together with T. B. Collinson and H. St. Hill reported on the earthquake damage in Wellington (see Government Gazette entry). Douglas McKain arrived in Wellington in May 1841 on board the "Olympus".

McKay, Alexander

Source: McKay, A. 1902. Report on the recent seismic disturbances within Cheviot County in Northern Canterbury and the Amuri District of Nelson, New Zealand (November and December 1901). Wellington, New Zealand: Government Printer. 472p.
Location: Awatere Valley, Marlborough, Nelson, Wellington.
Keywords: secondary, faulting

The first recorded series of violent earthquakes, affecting the north-east district of the South Island, took place in 1848. The seat of disturbance appears to have been the Awatere Valley,

in the Marlborough Provincial District; but violent earthquakes were experienced in Nelson, and in Wellington on the opposite side of Cook Strait. This series of earthquakes formed or reopened a line of fracture extending nearly the whole length of the Awatere Valley, along which the rupture and displacements can be traced even now.

Notes:

A photograph of the Awatere Fault between Lee Brook and Castle River, upper Awatere Valley, taken by McKay in 1888 was first published in his 1902 account of the Cheviot Earthquake. The photo caption reads "Fault-line and Earthquake rent, Awatere Valley; not disturbed since 1848".

McKay, Joseph Angus

Source: *McKay, J. A. 1949.* Historical Poverty Bay and the East Coast, North Island, New Zealand. Gisborne, NZ: J. A. McKay.

Location: Poverty Bay

Keywords: secondary, mainshock, aftershocks

Only tremors were felt in Poverty Bay on the occasion of the unnerving earthquake which so severely alarmed the residents of Wellington on 17 October[*].

Notes:

* While this date may be a mistaken reference to the first shock of 16 October, on Tuesday afternoon at 3.40, 17th October, a large aftershock occurred. According to Judge Chapman in Wellington "…. There was first a short and moderate shock – then a loud sound, and then a shock of great violence. I could scarcely keep my legs".

Manson, Celia

Source: Manson, C. 1974. "The Story of a New Zealand Family, Part 1". Queen Charlotte Sound, New Zealand: Cape Catley Ltd.

Location: Port Underwood, Marlborough

Keywords: secondary/reminiscence, mainshock, aftershocks, ground damage, building damage, atmospheric effects

Chapter 32

… Sally (Dougherty) had gone to bed in great unease of spirit on the night of the 16 October… Suddenly Sally sat up in alarm. Quickly she realised what had wakened her. Far away there was a hollow, roaring sound, rapidly coming nearer. As she sat up her four-poster curtained bed gave a creak and a jerk and began to sway, then the whole house did the same. Then everything happened at once…

The children shrieked, the kettle spilled over, and the water hissed in the embers. The house swayed from side to side. There was a long series of crashes and splintering sounds as books, china and glasses jerked from their shelves on to the trampled clay floor. In the background was the roaring noise. For a minute or more, and it seemed like an hour, the swaying and the rattling and crashing went on. Then there was stillness, followed by intermittent upheavals. The roaring had ceased….

There was no more sleep for anyone at Cutter's Bay that night, or indeed all round the Cloudy Bay and Sounds area...

At intervals that night and all the next day, in fact for the next two weeks round Cloudy Bay, there were more shocks with the same sickening wave-like motion. Cracks had appeared in the ground and on the hillsides; rocks had broken off the cliffs and come bounding down into the valley and beach. Sally was frightened to let the children go out, though it was questionable whether it was any safer inside. The great stone chimney had cracked right through, and there were many and deep cracks in the clay walls of the house.

But remarkably little damage had been done to their small world, considering the severity of the earthquake. Something which relieved Sally was to find that her favourite blue and white striped dinner-set was intact, though the cups had swung most violently on their hooks on the Welsh dresser.

The long streak of red light had appeared, flaring across the northern sky between 9 and 10 o'clock [*]. Then after a quarter of an hour it had vanished. Dan [Dougherty – her husband] comparing notes some time later, was told by a friend, the skipper of the Sarah Ann,[**] that while off Kapiti Island that night he had seen bright flames shooting up in the sky in a north-easterly direction.

The next night (17 October) there was another severe earthquake, though everyone was more prepared for it.

Cutter's Bay looked more desolate now than it had with the disappearance of its former population [the whalers]. That and the fact of the dangerous crack in the great stone chimney were along enough to make Sally anxious to press on with the move to the Wairau. On the succeeding nights of quakes they all slept well away from the chimney, but had the uncomfortable feeling of mistrusting the very house they lived in. Elsewhere in Cloudy Bay not a chimney was left standing.

Notes:

* The *Aurora Australis*

** The Spectator (4 November) reports that the Sarah Ann was about twenty miles [30 km] off Cape Campbell when the first great shock occurred. When off Entry Island (Kapiti Island) on Tuesday the 17th, the Captain saw the Auroa Australis ("the bearing of the light was in a north-easterly direction").

The Dougherty's house at Cutter's Bay was a thatched part wood-part mud cottage with a tamped clay floor situated well back from the beach under "Lookout Hill". Other "reed" and "rough" wooden huts thatched with toitoi were located nearer the beach. The cob cottage was typically constructed with thick walls made of mud mixed with rushes or chopped up tussock kneaded together and sun dried. Rushes or toitoi were used for roofing. The internal walls were lined with calico, and whitewashed. These dwellings represented a second or even a third stage in the evolution of the Marlborough homestead and most postdate 1848, when the most common type of house was the raupo whare (see Gouland entry). In 1849 the Boulder Bank had 4 or 5 mud buildings - two on Wynen's side (NW), two on Francis Macdonald's side (?SE), and William Budge's (?rebuilt) house on the point

between the Opawa and Wairau rivers. James Wynen's dwelling was a combined store/accommodation house that had been transported from Port Underwood in 1847 and therefore cannot have been a mud house.

Manson, Celia and Cecil

Source: Manson, C., Manson, C. 1962. Articles in the Dominion, 1962 July 14 (Before We Forget. Calamitous Year for the Infant Town of Wellington) and July 20 (Even shaky Land Better than Cruel Sea).

Location: Wellington

Keywords: primary, secondary, background, mainshock, aftershocks, casualty, building damage, response/recovery

[Dominion July 14 1962]

Perhaps today, the nearest equivalent in size to the Wellington of 1848 is Picton.

"When I saw it for the first time," an immigrant wrote, "it presented a clean and agreeable but primitive appearance. The principal street was 'the Beach', a narrow space between the houses and high-water mark, called the road."

He went on: "in parts of it, two carts could hardly pass. And over it I have seen the water flow at high tide. Along this beach were the principal shops and stores, whilst back from them and on the flats, one at each end of this beach, houses were like a few sheep in a very large field..

"A few of the shops were good and would not have discredited a provincial town in England. Here and there was a commodious store, a large dwelling house and a creditable public building."

Wellington, after the alarms of her little war in 1846, had had two years respite from excitements, two years in which to recover breath and settle down to what she hoped would be undisturbed growth.

Auckland was still the capital, but in January Governor Grey had appointed a Lieutenant-Governor, Eyre, to represent him in Wellington.

Eyre had not been in office for a year when a calamity in the shape of an earthquake struck the little town which damaged not only much that had been so painstakingly built, but also his own reputation.

Here is a description of the calamity by a 16-year-old son of a minister, writing to his father in Auckland.

"Sunday, October 15, was a very cold, windy, and rainy day. Mr. Creed preached in our church in the morning and evening and little did I think his were the last sermons I should ever hear there. We went to bed at our usual hour, but at 20 minutes to 2 of the 16th, I was awakened by finding the house rocking and rolling so that I could scarcely keep in bed.

"Will was awake and asked me if I knew what it was. I thought directly it was an earthquake. Never shall I forget when my mother came up and said the chapel was split. After the first shock we had shock after shock, all day, and now and then in the night.

"Tuesday the 17th was a beautiful day. A little after 3 o'clock in the afternoon we had a slight shock which was almost immediately succeeded by another of awful violence. I could scarcely keep my legs. It seemed as if the place would have turned right over. The end of Tyser and Waitt's large brick building came down with a terrible crash as did also the store of Mr. Fitzherbert,

"Poor Sergeant Lovel was standing down Farish Street and his two children were playing about when the shock came. The end of Mr. Fitzherbert's store fell upon him and broke and shattered his leg below the knee. A building on the other side fell upon the two children, killing one and injuring the other so severely that it died at 11 o'clock that night. For himself, poor man, he held out till Friday, when he calmly fell asleep, departing without a sigh or a tear. Next day he was interred with the usual Military honours.

"We slept on Tuesday in a tent near Mr. Ironside's. During Wednesday, which was a cold, rainy day, we had several slight shocks, but about 4 on Thursday morning we had another one which took the chapel down level with the ground.

"Not a brick, however, touched our house, the walls falling mostly inward or on the other side, where it threw down the school house. Captain Rhode's warehouse has fallen and some thousands of pounds worth of goods are lost.

"On Thursday night we went up the hill near Mr. Tankersley's upland Kelburn farm. We had a fine fire and none of us experienced any bad effects from the exposure. On that night the ground appeared to be all of a tremble.

"On Friday we had a solemn fast. Many attended service who were strangers to God's House. We had services at the kirk, for our chapel, Mr. Green's and Mr. Woodward's are all down.

"No business is doing. People are talking of leaving the place. The loss is estimated at about £40,000. Mr. and Mrs. Fitzherbert are going to Sydney and others are talking of leaving. We have in port H.M.S.Fly, the barque Subraon, the Clara and the Blundell, the Sarah Ann, the Bee and some coasters. The Lieutenant-Governor has issued orders that no vessel should leave port."

But already, while the boy still wrote, another letter was on its way to Auckland. Lieutenant-Governor Eyre had penned it, on Thursday, the 19th, the fourth day of the earthquakes, the day on which, early in the morning, the worst shock of all had been felt. That shock had had its effect on his nerves, already conditioned by the daily sight of homeless families camping in the passages of Government House.

It would be three weeks before the dispatch, sent by Maori runner, would be in the hands of his superior. Meanwhile, he had little inkling of the fury which his defeatist attitude would arouse, not only in Grey, a man used to overcoming difficulties, but even in the people of battered Wellington.

[Dominion July 20, 1962]
"Give me dry land, even if it does shake a bit", was the verdict of a woman passenger saved from the wreck of the Soubraon [sic] at Palmer head in October 1848.

The Soubraon [sic] passengers were not the only ones to sense that things, perhaps, were not so bad after all; that possibly they had been over-hasty in trying to flee the eight-year-old city of Wellington after its terrifying earthquake that had rocked it that spring.

Only masonry buildings had fallen. The rest stood, and life was rapidly returning to normal. The band of the 65th Regiment was giving its usual weekly concert of gay music – drum-polkas and waltzes – among the rubble of ruined buildings near the Beach – Lambton Quay. The Horticultural Society postponed its exhibition for only two weeks, and then gave the first prize to a Mr. Spinks, one of those who had tried to take his family away on the Soubraon [sic].

So, while Lieut.-Governor Eyre's dispatch about the disaster was on its three weeks' journey by runner to Governor Grey in Auckland, the spirits of Wellingtonians were steadily rising.

The defeatism expressed in the dispatch which annoyed Grey so intensely, was not typical of Eyre. In fact, he had done very brave things, particularly in his hazardous and gruelling explorations in Australia not long before coming to New Zealand.

"Anyway," said Grey when he had read the dispatch, "if Eyre has temporarily lost his nerve, the only thing is for me to go down to Wellington and take over," and forthwith he made preparations to sail in the Government brig.

Publication of the dispatch however, moved the people of Auckland to sympathy even for their rivals of Wellington and Bishop Selwyn headed the committee to raise funds to relieve distress, quoting "bis dat qui cito dat" ("he gives twice who gives quickly"), and obtaining a ready response.

Meanwhile, the Auckland newspaper, while sympathising with the Wellington sufferers, roundly condemned Eyre for his despondency and stigmatised as "one of the most malevolent predications we have ever been called upon to contradict" the suggestion that the whole country, including Auckland, might have suffered in the same way. As if Auckland would share an earthquake with Wellington!

So it was that when the Government brig sailed into Wellington harbour she brought not only Governor Grey and his staff, but also a bag of gold – six hundred and fifty sovereigns – for

the distressed.

But who was distressed?

The leading citizens of Wellington found their feelings strangely mixed when they heard of this gift. Apart from the fact that there was little evidence of distress, was it not unfair for the poor people of Auckland to have to subscribe, and in any case was it not below the dignity of Wellington to accept? Surely Wellington could stand on her own feet to see this thing through?

The minutes of meetings held to discuss what should be done are to be seen in our archives.

"We have held two meetings, reported a Mr. Woodward (Woodward Street), and we asked members to report any cases of distress. So few were reported that the Committee thought that the money should be returned. We are unwilling to use the fund for any purpose other than that for which it was subscribed".

"To return the money," argued Mr. Roots, "would be an insult to the people of Auckland."

Dr. Featherstone spoke. "After the great rivalry there has always been between Auckland and Wellington, I feel it is incumbent on us to respond to Auckland in the same generous spirit.

"But the Lieut.-Governor has informed the people of Auckland that Wellington is in ruins. That is not true. Out of £200,000's worth of property, out £15,000's worth of damage has been done. Was the Lieut.-Governor justified, even in the excitement of the moment, in making assertions which would do infinitely more damage than the earthquake?

"The Lieut.-Governor also stated that a blow had been struck at the prosperity, almost at the very existence of the settlement. Why! From the very beginning there have been blows – unsettled land claims, fires, the Wairau massacre, war! These blows only stimulated us to fresh exertions! Let us thank Auckland for its generosity, but return the money!"

The arguments went on.

To Issac Featherstone and William Fox, both to become notable in New Zealand's affairs, the chief worry was the damage which reports of the earthquake might do to the flow of immigrants from England.

This was a year of social upheaval in Europe, and many might be tempted to emigrate thence to new lands. There were revolutions in France, Austria, and Germany, troubles in Ireland, and a general monetary crisis.

Fox said: "It will depend on our decision in this matter whether numerous parties wishing to escape from those moral and political earthquakes now agitating Europe will come here or not. Our acceptance of Auckland's gift would set the seal to the report that has gone home. On

behalf of the New Zealand Company I would like to head a list of subscriptions for any relief needed."

The Auckland gift was refused, and Wellington resumed its normal life. The pilot who had caused the wreck of the Soubraon [sic] was dismissed. Government House was cleared of its temporary hospital patients and refugees. Temporary stores replaced the brick warehouses which had fallen, and J. Lloyd, pastry cook, respectively intimated "to the inhabitants of Wellington that, having repaired part of the damages occasioned by the late awful visitation of the Almighty", he would resume his business as usual on Saturday next, the 18th November, 1848.

Wellington had put her 10 days terror firmly behind her.

Masters, Joseph
Source: Masters, J. ca. 1871. The autobiography of Joseph Masters. MS-Copy-Micro-171. Alexander Turnbull Library, NLNZ.
Location: Wellington
Keywords: primary/reminiscence, casualty, response/recovery, building damage

p.30.
Altogether our first great earthquake too place in 1848; we had many previous shakes, but we thought little of them, but this one fetched down all the brick buildings with the chimneys. Sergeant Lovell late of the Royal Artillery and Barrack Master with two of his children, were killed by the falling of a brick wall. Every animal seemed terror stricken. Nothing makes a ?man feel his littleness equal to a mighty earthquake. A number of persons in the midst of their fright, went on board a vessel in the harbour, the "Subraon" making great sacrifices in their hast to get away as the vessel was to sail immediately for Sydney, but the Almighty ordained it otherwise, and she was wrecked at the heads going out to sea. Fortunately no lives were lost. The inhabitants seemed beside themselves as shake after shake was felt. Out-door worship was numerously attended. All business was at a stand and a number of prayer meetings were held in private houses and many of no religion were brought to cry for mercy. But no sooner had the shakes subsided than the former terror seemed to be forgotten, and most of these "returned like a dog to the vomit". A house I had built, and which I had given to my son-in-law, and by him let to the Rev. ? Green?, a dissenting minister whose lady kept a school for young girls, fortunately I had put wooden studs to carry the roof, the walls fell outward as by a miracle. There were no less than thirty young girls inside and all escaped without the slightest injury except fright. Every brick building or nearly so were levelled to the ground.

Munn Family
Source: Munn Family Papers. The Munn Family of Wellington and Napier. MS Papers 4280, Alexander Turnbull Library, NLNZ.
Location: Wellington.
Keywords: primary/reminiscence, mainshock, aftershocks, building damage, casualty

p.31

On Monday 16th October at half past one in the morning, Wellington was hit by a severe earthquake. The shocks continued at intervals until half past seven. Daybreak revealed a city in ruins. The heaviest shock was felt on the flats and along the beach; on the hills behind the shock was lighter. The great shock of Monday morning was followed at the intervals of three tides, about thirty-seven and a half hours, on Tuesday afternoon by another, and after a like interval of some thirty-seven hours, perhaps the most terrific of all, on Thursday morning about five.

On Tuesday 19th 'Mr Lovell, Barrack Sergeant in charge of the commissariat stores in the large brick building on the beach, was there looking after the Government property under his care when the shock occurred. He had his two dear children with him; the youngest a girl of four, and the other a fine little boy of seven. The shock was so sharp and sudden, that, before they could escape a brick wall fell upon them, and buried them under its ruin. The girl was killed instantly, the boy died the same night. Mr Lovell lingered for a day of two and then died, leaving a widow and two young children to grieve over their sudden and unexpected bereavement'.[*]

Notes:

*This last part is quoted from the Rev. Samuel Ironside's article in The New Zealand Methodist (September 12, 1891. Missionary Reminiscences, No. XXIL).

Musgrave, T

Source: Musgrave, T. 1854. Survey map of January 1854 (S.O. 2941: DOSLI, Blenheim) and Survey Book. Copies held at Marlborough Historical Society Archives, Blenheim.

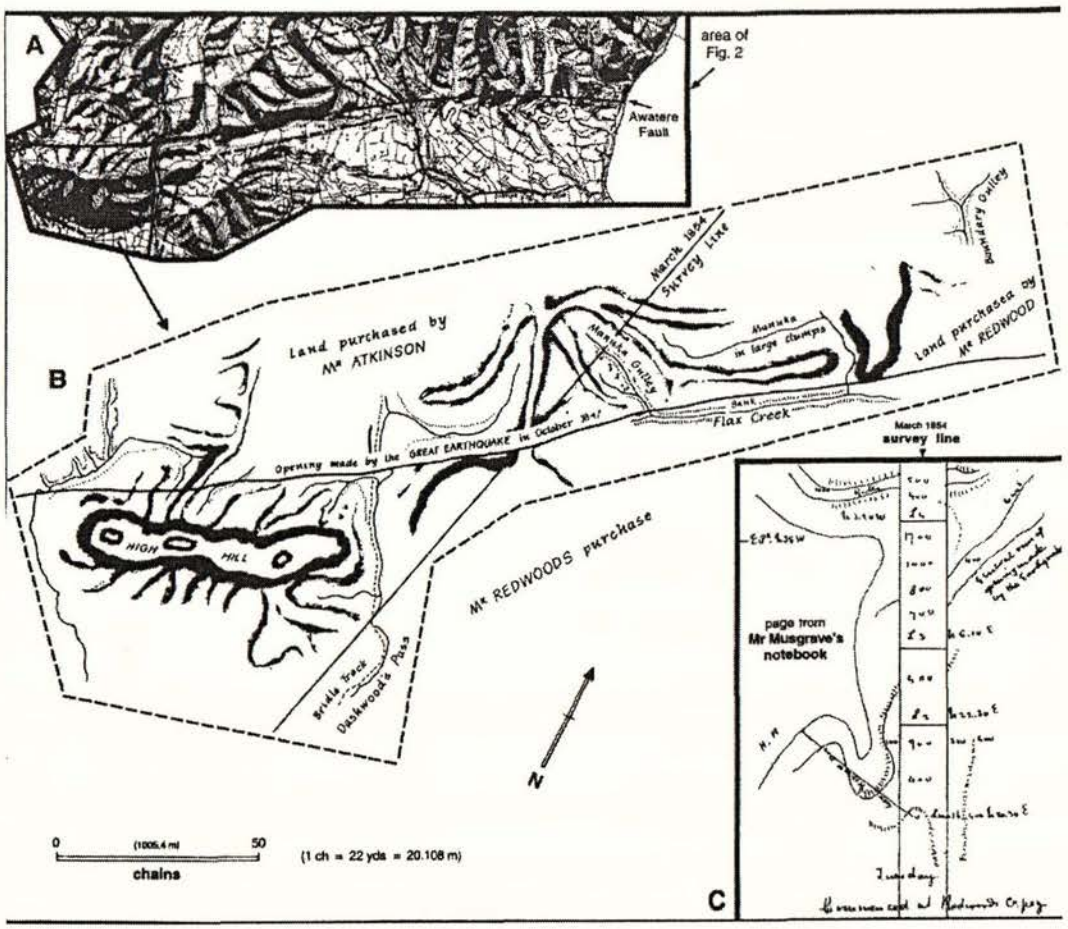
Location: Awatere Valley

Keywords: primary, faulting

Notes:

On the survey map between Stafford Creek and Boundary Stream, Awatere Valley, is marked the line with the text; "Opening made by the GREAT EARTHQUAKE on October 1847 [sic]" (Figure B overleaf). On a subsequent tracing of the map (signed by T. Musgrave), the correct year (1848) is written. Figure A shows the location of Figure B on a modern topographic map of the lower part of the Awatere Valley.

Page 46 of Musgrave's survey book (Figure C overleaf) shows the "N44°E" (magnetic) strike of the "General run of the opening made by the earthquake". Comparison of the mapped fissure with that of the present day trace of the Awatere Fault shows that they coincide exactly.



New Zealand Government Gazette

Source: New Zealand Government Gazette (Province of New Munster) October 1848, No. 2.

Location: Wellington

Keywords: primary, response/recovery

PROCLAMATION

Whereas it has pleased Almighty God to visit this settlement with a great and grievous calamity and it is fitting that a public acknowledgment by made of the Divine power, on whom all operations of nature and the security of its creatures depend, and that prayers and supplications be offered up to Almighty God to avert the recurrence of any similar visitation. Now therefore, I, Edward John Eyre, Lieutenant Governor of the Province of New Munster, by and with the advice of my Executive Council, do hereby proclaim and declare that to-morrow, the 20th day of October, shall be held as a day of fast, prayer, and humiliation.

Given under my hand and seal, at Government House, Wellington, this 19th day of October, 1848.

E. Eyre.

By His Excellency's command,

Alfred Domett,

Colonial Secretary

NOTICE

In reference to the Proclamation of the Lieutenant-Governor appointing to-morrow the 20th instant, for a day of Public Solemn Fast, Prayer, and Humiliation, the Rev. Mr. Cole begs to give notice that Divine Service will be performed at the Episcopal Church, Te Aro, at Ten a.m. and at Three p.m. and on Thorndon Flat at half past four p.m. Thursday, 19th October 1848.

In reference to the Proclamation of the Lieutenant-Governor appointing to-morrow, the 20th instant, for a day of Public Solemn Fast, Prayer, and Humiliation, the Rev. O'Reily begs to give notice to his congregation that the Holy Sacrifice of the Mass will be offered up at half past ten o'clock.

The Governor having been appointed to-morrow the 20th inst., to be held as a day of public fast, prayer, and humiliation, the Ministers of the Evangelical Alliance in Wellington cordially invite all their members and congregation to meet together in the Scotch Church for religious services, at 11 a.m. and at 3 and 6 p.m.

Source: Collinson, J. B., Park, R., & St Hill, H. (1848): Report on earthquake damage in Wellington (dated November 21, 1848). *In: New Zealand Government Gazette,* December 6, 1848.

Location: Wellington, Wanganui, New Plymouth, Hawke's Bay, Auckland, Nelson, Wairau Valley; Banks Peninsula; Otago, Dunedin

Keywords: primary, response/recovery, building damage, mainshock, aftershocks, ground damage, faulting, atmospheric effects, tsunami/seiche

November 21, 1848.

Sir, - We have the honour to acknowledge the receipt of your letter of the 25th October, informing us that it was the desire of His Excellency the Lieutenant-Governor that a Board should be appointed to examine and report on the damage done in Wellington by the late earthquake, and further informing us that Mr. Park had been chosen by the inhabitants as a member of the Board on their part, and that the Council desired that Mr. St. Hill and Captain Collinson should act on the part of the Government.

We beg to report that in compliance with that letter, we have examined the damaged buildings and we herewith enclose a list of them. On that list is stated the manner in which the proprietors propose to repair their buildings, as they have informed us, and also what further measures we have, in some instances, considered necessary. In those cases where the damaged houses front the principal streets, and, in their present state, are a nuisance and a danger to the public, we beg to recommend that one month be allowed to the proprietors to repair them. The particular repairs required to such houses are marked in the list as being necessary to secure the public thoroughfares.

In addition to the damages mentioned in the list, we find that almost every chimney in the Town has been broken down close to the roof. As this is a very dangerous nuisance in a Town composed chiefly of wooden houses, we consider it very desirable that the inhabitants should

be obliged to build up the damaged chimnies to a safe height above the roof within two months.

The above forms the principal object of the Board; in the course of executing which we beg to state we have been very much assisted by the list of the damaged houses, drawn up by Sergeant Mills of the Armed Police.

But we further beg to offer a few remarks on the description of the buildings best adapted to stand shocks of earthquakes, which may be of use to persons about to build storehouses, which are desired to be more secure from fire than wooden houses.

We have observed that those brick buildings have suffered least which have had bond-timbers in the brickwork, or have been lined with wood, or weather-boarded; and that a great many gable-ends of houses in which the wall plate has not been carried throughout the gable, have been thrown down, without reference to any particular direction of the compass; and that the gable ends of hipped roofs on the contrary, have not suffered so much. And also that, in almost all the brickwork, the mortar has been of a very bad description, being composed of lime and clay, instead of lime and sand, as it should have been, by which, there has been so little bond in the brickwork, that many walls have been shaken down in single bricks.

The building we recommend for the above object, and for greater security against fire than a weatherboard house, is a strong wooden frame upon a brick foundation, filled in with bricknogging laid in mortar, and covered outside with strong laths and plaster, and inside with boards of plaster. But as it is probable that there will be almost always a great many houses in the Town built entirely of wood, we recommend it to the consideration of the inhabitants, that all future wooden houses should be separated from each other as much as possible, both as security against fire, and because the action of a shock is sometimes of an undulating kind, that will take more effect on a continuous line of buildings than on several detached small ones.

With respect to your letter of the 30th October, requesting us to prepare a general Report upon the earthquake, to show the direction of the earth's motion during the shocks, and other incidents, we beg to add a general account of the occurrence collected from the different statements that have arrived up to this time from the neighbouring places.

The action of the earthquake appears to have extended from about the latitude of Bank's Peninsula to the latitude of New Plymouth, the strongest force of it having been in Cook's Strait, and a N.W. and S.E. direction from thence.

It commenced on October 16th with a strong shock at 1hr. 30m, a.m.; on the 17th there was a second at 4 p.m.; on the 19th a third at 5 a.m.; on the 24th there was a fourth at 2 p.m.

These were all the strong shocks, but in the intervals there were a great number of smaller shocks, varying from 10 to 20 in the 24 hours; and these continued, gradually lessening in number and force, from the 16th to the 30th October; and from that time to this there have been several more violent than the small shocks. The strong shocks appear to have been felt at

all the settlements within the latitudes mentioned, and, as far as we can determine, simultaneously; but we have no certain data to decide this point; and also with the same character; but less in force in proportion to the distance from Cook's Strait, and the line of N.E. and S.W. direction.

The strong shocks were all of this character:- A sound like subterranean thunder, accompanied by a vibration of the ground for a few seconds, and then a quick heaving oscillation of the earth, which, in a few seconds more died away with a quivering motion, the small shocks had not much of the heaving motion, but were more like the firing of cannon immediately underneath the place; they were sometimes so frequent that it sounded like a distant cannonade, while the earth appeared to tremble incessantly for 2 to 3 hours together.

The direction of the noise, and the motion of the earth, appeared to some people to come from the Southward, to others from the Northward; the buildings that have been damaged, are injured principally on the S.E. sides, and on the N.W. sides. A billiard table in Barrett's Hotel was moved an inch to the S.E. The shocks were felt at Nelson a little more violently than at Wanganui; hardly at all at Hawke's Bay, and as strongly at Bank's Peninsula as at Wanganui. Therefore we conclude the line of direction to be N.E. and S.W.

There have been a few cracks made in the ground at Wellington, and at the mouths of some small rivers on the N.W. coast, and at the mouth of the Wairau; they are long narrow cracks, not larger than those caused by a long drought.

On the 16th October, eight hours after the first shock, it being high water but neap tides, the tide rose in Wellington one foot above ordinary spring tides; but this might have been occasioned by a strong S.E. wind, which lasted the 15th and 16th. On the 17th it was calm fine weather; on the 19th strong S.E. gale; on the 24th fine and calm.

On the 19th and 20th the Aurora Australis was very brilliant in the S.E., but there was nothing to indicate it had any connection with the earthquake. There was no change in the Barometer or Thermometer that would appear to have given warning of the shock.

It appears to have been felt less on higher grounds, and upon rocky foundations.

The last winter has been an unusually rainy season, with little wind, and this is a circumstance which is said to be connected with earthquakes in South America.

It appears not to have been felt at all at Otakou [Dunedin] or Auckland.

Up to this date no eruption has been heard of at any place within the limits of the earthquake as above stated.

We have endeavored to ascertain the amount of damage done to the Town, and we consider that at the utmost, it is not more than £15,000 in property of all descriptions, and that includes £3500 of the Colonial Government, and £1000 of H.M. Ordinance.

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We have the honour to be, Sir,

Your obedient Servants,
J. B. Collinson, Capt. R. E.
Robert Park, Civil Engineer,
Henry St. Hill, R. M.

Notes:

The schedule of damage to houses was not published with the above letter in the Government Gazette. It was published in British Parliamentary Papers (q.v.).

Newland, John.
Source: Newland, J. 1848 Journal ARC2001-120 Newland, John, Puke Ariki Collection, Taranaki Museum, New Plymouth, NZ.
Location: New Plymouth, Wellington
Keywords: primary, mainshock, building damage, aftershocks

[At New Plymouth]
October 16
The Shock of an earthquake was felt this morning at 2 o'clock by most of the settlers in this district.

Nov. 4.
The schooner *Carbon* arrived at New Plymouth this afternoon from Wellington bringing information of the dreadful effects of the Earthquake at that place on the 16th ult. also on the two following days, the principal stores in the place were completely leveled to the ground also the Methodist Chapel a large building with many other houses. N.B. The visitation lasted for 8 days.

Newspapers and magazines

DAILY NEWS (Published in London)
Source: Daily News, March 22, 1849. (Reprinted in the *New Zealand Journal*, March 24, 1849)
Location: Wellington, Nelson, Auckland, Wanganui, Marlborough, Wairarapa, Canterbury
Keywords: secondary, mainshock, aftershocks, casualty, atmospheric effects

The middle and northern islands of the New Zealand group – both sides of Cook's Strait – have been visited with a series of violent shocks of earthquake, extending over a wide range of country and through a considerable number of days. Though devastating to house and other property, they have providentially been restrained from much destruction of life. Only one family, Barrack-Sergeant Lovell and his son and daughter, both children, are reported as sufferers. The intelligence was brought to Singapore by the *Clara*, which arrived there with letters from New Zealand, and papers to the 15th of November, before the mail was

despatched. We subjoin such extracts from papers and information gleaned from other sources as our Singapore correspondent has forwarded to us, deeming it best on such occasions to present the news to our readers in the form it has reached us. It may, however, facilitate the formation of an accurate estimate of the range of the casualty and its effects, to give by way of preface a general summary of the principal points.

At Wellington the first shock, and it appears to have been a very severe one, was experienced about half-past one A.M. on the morning of Monday, the 16th of October. Three or four slight quiverings were subsequently felt in the course of the day. Two slight shocks were felt at four and half-past seven A.M. on Tuesday. At half-past three P.M. a slight shock was perceived; this was immediately followed by a second, also slight; and then came a third if anything more severe than the first, of Monday. Wednesday passed over with two or three slight shocks. A few minutes before five A.M., on Thursday the 19th, a third severe shock occurred, which lasted almost a minute. On Friday shocks, but not severe ones, were felt at intervals. The slight shocks still continued on Saturday. On Sunday shocks continued to take place at intervals of three or four hours. On Monday a few slight vibrations were felt. On Tuesday, the 24th, a slight tremble was perceived at ten minutes to two P.M., and in the space of seven minutes and [a] half there were three vibrations. Shocks continued to be felt throughout the evening. On the west of Wellington, all the shocks felt previous to the 23rd, were experienced at Wanganui, but with less violence. They had occurred at all the intervening places, becoming more violent as they approached Wellington. The schooner *Sarah Ann* felt the first shock of the earthquake, when off Taranaki, on the morning of the 16th; she also experienced the shocks of the 23rd, off Kapiti. At Nelson all the shocks appear to have been felt, but with less violence than at Wellington; the severest at Nelson was that of the 22nd. The earthquake did much damage in Queen Charlotte's Sound and at Cloudy Bay, but we have no particulars, nor any note of the times at which the shocks occurred. On the east of Wellington, the shocks were felt severely in the valley of the Wairarapa, but there is no note of the times of their occurrence. The *Clara*, on her passage from Auckland to Wellington, experienced a shock when sixty miles from the shore; and a second when working in at the heads of Port Nicholson, on the 18th. The first shock (on the morning of Monday, the 16th) was felt with great violence at Akaroa, and lasted three or four minutes; but, what is remarkable, it is said not to have been felt at Port Cooper, a few miles to the westward. The brig *Bee*, which arrived at Wellington from Twofold Bay (N. S. Wales), on the 23rd, does not appear to have felt any of the shocks. So far as our information goes, the earthquakes lasted nine days, and were felt at various places, from the [1]73rd to the [1]76th degree of east longitude, and from the 39th to the 44th degree of south latitude. The heaviest and most continuous shocks were experienced at Wellington, Queen Charlotte's Sound, and Cloudy Bay, nearly in the centre of the region over which they extended. The earthquakes were preceded by stormy weather, with heavy gales from the south and east, which lasted the greater part of the nine days. The volcano of Tongariro was not in activity, nor were any others known to be so. On the afternoon of Tuesday, the 17th, a bright flame was seen to shoot up in the north-east at Wellington, and on board the Sarah Ann, then off Kapiti. At Nelson the atmosphere is said to have been surcharged with electricity.

These are the important general facts of this tremendous convulsion of nature which can be regarded as ascertained. In the majority of cases the periods of the shocks are vaguely stated; and no great reliance can be placed on what is said of their comparative violence. But Lieut.-Governor Eyre and several gentlemen both at Wellington and Nelson are able and intelligent observers; so we have reason to expect accounts of the phenomena of scientific value. It is gratifying to learn that there has been so little loss of life, and that the settlers are noways disheartened. The conduct of Mr. Eyre appears to have been most praiseworthy. We subjoin the details as we have received them.

NELSON EXAMINER & NEW ZEALAND CHRONICLE (Published in Nelson)
Source: The Nelson Examiner & New Zealand Chronicle, October 21, 1848
Location: Nelson
Keywords: primary, secondary, mainshock, aftershocks, atmospheric effects, building damage, response/recovery

[October 21, 1848]
During the present week, the inhabitants of the town and neighbourhood of Nelson have been kept in a state of considerable excitement, from the occurrence of one of those singular subterranean phenomena, which in some countries are occasionally productive of great devastation and physical calamity, but which, in New Zealand, have hitherto apparently been unattended with any very destructive effects.

On Monday last, at 1h. 40m., p.m. [sic], an earth-tremor, or, as it is commonly called, an earthquake, unceremoniously rouse d every body from their sleep by the violence and long continuance of its vibratory movements, causing somewhat alarming oscillations of the walls of their dwellings, as well as of the furniture in the interior. The first shock lasted upwards of two minutes (though some are of [the] opinion that three distinct shocks were comprised in this time) and was succeeded by numerous others of greater or lesser force for the space of an hour, after which, and during the whole of the day, vibrations of a minor kind were constantly experienced. On Tuesday the state of things was no better – a violent but short concussion taking place at 3h. 40m., p.m. preceded and followed by many minor tremors. On Wednesday the earth was in a very tremulous state, but there were no shocks of much force. In the evening, the *Aurora Australis* was visible for a considerable time, throwing out rays of lurid light, and giving to the sky a wild and somewhat ominous aspect. On Thursday again a smart shock occurred at 4h. 55m., a.m., lasting nearly half a minute, and, as on the previous days, there was a constant succession of vibrations and concussions of lesser force. In the evening, at about 7 o'clock, there was a tremendous thunder storm, which passed over a part of the town only, from the directions of east, or south-east. The *Aurora Australis* again made its appearance at about nine, exhibiting its coruscations in the same singular manner, and adding as it were to the intensity of excitement and anxiety in the minds of many, which had been produced by these unusual demonstrations of terrestrial agitation. On Friday, the earth's crust still laboured under the same causes of commotion as before – the undulatory movements, although generally slight, constantly occurring at short intervals during the whole of the day and following night. The shocks appear all to have come from about N.E., and as they were

felt both in the Straits and at the mouth of the bay, by the *Supply* and the *Ralph Bernal*, we make no doubt but they have been experienced with equal severity in the other island.

Although the people in the town are considerably alarmed, and still anxious as regards the stability of their dwellings against such repeated and long continued concussions, we do no hear of much damage having been sustained. One or two chimneys have been partially dislodged, and fissures have occurred in the walls of two or three brick dwellings.

Undoubtedly this has been the most serious visitation of the kind, that we have experienced since the formation of the settlement, and one that will naturally cause a little anxiety to the more timid, although in reality we ourselves see no further cause for permanent alarm than may be adduced from the demonstration of other phenomena during nature's progressive development of her mysteries, or, than what may happen in the common chapter of accidents incidental to human life.

In concluding our notes of this subject, it may not be amiss to suggest, that it behoves all persons about to erect houses of brick or stone, to be careful in having their work well bonded and cemented together, and the foundations properly secured. Some of the buildings of this kind that have been constructed in the settlement have been far from sufficiently substantial in this respect.

Source: Nelson Examiner and New Zealand Chronicle, October 28, 1848
Location: Nelson
Keywords: primary, secondary, mainshock, aftershocks, building damage, ground damage

[October 28, 1848]
Since our last publication, we have experienced several slight shocks of earthquakes, but none of any violence. The strongest, we believe, was on the afternoon of Sunday, about half-past three o'clock. So late as Thursday night and Friday morning they were felt, but we have not heard of any since. The intelligence received yesterday from Wellington shows us that the force of these phenomena was greatest on the other side of the Straits, and we look with anxiety for news from the North to learn how far they extended in that direction.

The damage done in Nelson by this visitation is very inconsiderable. The only building which has sustained any serious mischief is the house built on the beach, overlooking the mouth of the Waimea, by the late H. A. Thompson, Esq., and this had been previously shaken by a landslip, which had moved it bodily forward for a short distance towards the sea. The chimneys of this building were all damaged or thrown down, and one or two fissures made in the walls, which are composed of round stones collected from the beach. The buildings which have been slightly injured are the Wesleyan Chapel, the Bonded Store of Messrs. Morrison and Sclanders, the upper story [storey] of the Flour Mill, the houses of Mr. Snow and Mr. Foy, in Trafalgar-street, and a mud house near the Eel Pond. These, with the exception of the last, are all composed of brick, but they were either known to be defectively built, or of very slight materials, the walls of some being only a single brick thick, and others only half that thickness. We believe that not a single properly-constructed building has sustained a particle

of damage, excepting the house of the late Mr. Thompson, which had been previously, from its improper site, rendered insecure. In addition to these casualties, one-chimney was thrown down, and four or five others damaged. It is wonderful, considering the violence of the shocks at Wellington, and their apparent severity here, that more mischief was not done us, when we know how slight some of our buildings are, and that many of the chimneys in the settlement are built with clay instead of lime. A gale of wind, such as is sometimes experienced on the coast of England, would have produced results far more serious.

The late phenomenon, like other secret workings of Nature, is beyond our comprehension, but as both from European and native testimony it appears to be unprecedented in the memory of man, we see no reason for future anxiety. As an evidence of the electric state of the atmosphere since the commencement of the shocks, it has been remarked in many instances that vegetation has made a progress truly wonderful.

[This issue also reprints article from the Spectator, dated October 18, 1848]

Source: Nelson Examiner and New Zealand Chronicle, November 11, 1848
Location: Nelson, Wellington, Taranaki, East Cape, Canterbury, Otago
Keywords: primary, secondary, aftershocks, building damage, response/recovery

[November 11, 1848]
Since our last notice of the earthquake a fortnight since, we have experienced, a few slight shocks, but none of any violence; and now that the alarm which was temporarily created in the minds of some, has subsided, we can better estimate the damage which these phenomena have done us. If we estimate this at £30, we know we shall be considered by many as placing it too high, because we have heard it said that, with the exception of the late Mr. Thompson's house, the whole of the damage done can be repaired for £5; and we understand the latter can be repaired and made habitable for about £10. This, it will be seen, is very different from the reports published in Wellington of our disasters, where it was represented by one journal that "Mr Thompson's house was entirely shattered," and in the other, that "most of the brick dwellings and chimneys in Nelson were level with the ground." So far, as we stated, is this from being the truth, that not a single properly-erected building in the settlement has suffered in the smallest degree.

The Wellington papers brought by the *Emily* give us further particulars of the earthquakes which have lately been so severely felt in that settlement. It appears from the accounts which have been received from the surrounding country, that the force of the shocks must have been greatest in the neighbourhood of Wellington. To the northward, and along the west coast of the island as far as Taranaki, the shocks were felt, but with diminished violence; and the same may be said of the east coast, but they did not extend beyond the East Cape. At Banks' Peninsula, which lies to the south-west of Wellington, smart shocks were experienced, but they did not reach Otago, about 180 miles lower down the coast. In Cook's Straits, opposite to Wellington, the shocks were very severe, while in Nelson, some 80 or 90 miles west of

Wellington, they were comparatively slight – the class of buildings which in the last-named settlement were thrown to the ground, receiving here no injury. It therefore seems that Wellington was the centre of the shocks, and that they radiated from thence until their force was expended. The *Wellington Independent* however is of the opinion that the earthquakes originated on the south-west coast of this island, and that they "traveled in a N.E. direction towards the Curtis' Island, lying about 400 miles off the East Coast." We cannot see how our contemporary arrived at this conclusion, as it seems to us directly opposed to the facts which had come to his knowledge. There is no reason to believe that a volcanic eruption had taken place.

Source: Nelson Examiner and New Zealand Chronicle, November 25, 1848.
Location: Marlborough, Awatere Valley, Wairau Valley
Keywords: secondary, ground damage, faulting

[November 25, 1848]
The Late Earthquake – We find by the accounts given us by a party of gentlemen returned from the Wairau, that in the Kaiparatihau district [lower Awatere Valley] the shocks of the late earthquake were very severe. From the White Bluff, extending in an easterly [sic] direction, there is for several miles a fissure in the ground, and the high and precipitous banks of some of the branch rivers have been thrown down. It is reported, also, that on the seaward face of the Bluff a large slip has taken place.

Source: Nelson Examiner and New Zealand Chronicle, December 9, 1848
Location: Wellington
Keywords: secondary, response/recovery

[December 9, 1848]
One of the most extraordinary documents we have ever seen in print, is Lieutenant-Governor Eyre's despatch to the Governor, furnishing an account of the earthquakes at Wellington. We have reprinted it, that our readers may have the benefit of perusal. If the object of his Excellency had been to destroy what the earthquakes had spared, he could not have taken means more likely to ensure success. His despatch is graphic, but highly mischievous. When men are called to high stations, they are expected to be equal to all emergencies, and, if they do not rise with the occasion, they show themselves unequal to their task.

It was quite proper that the Lieutenant-Governor should communicate the fact of the earthquakes at Wellington, and the extent of the mischief they had caused, to the Governor-in-Chief, but knowing that his dispatch would become a public document, and that it would carry with it an unusual degree of authority, he should have been careful how he made statements that would be productive of mischief. Only fancy the effect this document will produce in England, where it was forwarded by the *Dido* almost immediately after its receipt in Auckland:- "Wellington in ruins," "an immense destruction of property," "melancholy loss of life," "numbers of persons ruined," "many persons afraid of remaining in their houses at

night, and retiring for safety to the bush among the hills in wild and inclement weather," 'a blow struck at the prosperity, almost at the very existence of the settlement from which it will not readily recover," "terror and dismay" everywhere prevailing, "energies of all the settlers paralyzed," "a general presentiment that some still more fearful catastrophe will happen," and his Excellency's apprehension that the calamity "will drive from the colony all who can find the means of getting away." Here is comfort for the friends of the colony in England. Here are inducements offered by a Governor to people to come and live in his province. And what an encouraging effect it will have on the mercantile interests of Wellington. How readily people in England will consign goods, and have business transactions with the ruined inhabitants of a town destroyed by an earthquake, where all who had the means will have left the settlement. The actual losses incurred by the Wellington settlers have already been sufficiently great, and needed not this most ill-advised dispatch of Lieutenant-Governor Eyre to crown their sufferings.

NEW ZEALAND EVANGELIST

Source: New Zealand Evangelist Vol.1, No. V; November 5, 1848

Location: Wellington, Canterbury, North West Nelson, Wairarapa, Taranaki, Marlborough, Cape Farewell, Banks Peninsula, Otago, Hawke's Bay

Keywords: secondary, mainshock, aftershocks, ground damage, volcanic effects, building damage, casualty, response/recovery, background

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THE EARTHQUAKES

Since the commencement of this colony slight shocks of earthquakes have been felt on an average two or three times in a year; but these shocks were so slight as neither to cause damage nor produce alarm. We have felt none, however, for a twelvemonth; but during the present month we have been visited with a perfect storm of them – of more than a fortnight's duration, and they are not yet over – alarming and destructive, beyond anything ever witnessed in this country by the oldest settler, or known by tradition to the oldest native. We have had four tremendous shocks, with from one or two hundred slighter ones, varying in all degrees of strength from the slightest tremor to a very smart concussion; after some of the great shocks the earth seemed for hours to be in a constant state of oscillation. The first of the three violent shocks occurred at low water, and followed each other after an interval of three tides, or about 37 1/2 hours. The first was on Monday the 16th, at about 20 minutes before 2 in the morning; the second on Tuesday the 17th, about 20 minutes past three in the afternoon; and the third on Thursday the 19th, about 5 in the morning. The second was more violent than the first, and the third more violent than either. The fourth violent shock did not take place until Tuesday the 24th, at about 2 o'clock in the afternoon, and seems to have been differently felt from the other three; in some places more, in others less than any of them. The motion of the shocks seemed sometimes to be undulatory, and again it appeared to be vertical and heaved and jolted upwards. The shocks were often preceded by a hollow rumbling sound like the distant boom of cannon; latterly the sound was often heard without any shock being felt;

and on the other hand the sharpest of the secondary shocks were often preceded neither by sound not any note of warning. The barometer stood unusually low till after the third shock; on Wednesday the 18th it stood as low as 29.14. The shocks were most violent and destructive on alluvial sand, or gravelly formations, as [at] Te Aro and Thorndon flats; on the clay-stone formation, as on the terraces surrounding the town, they were somewhat less violent; and on the Karori-road, at Wades' town, and Kai Warra, where the houses are nearer the rock, the shocks were comparatively light. Small clefts were made in the earth in some places, but the water in the wells has not been disturbed. The shocks were felt from Bank's Peninsula to Cape Farewell, on the Middle Island, and from beyond the Wairarapa to Taranaki on this island; but so far as we have heard they were not felt at Otakou, nor in Hawke's Bay on the East Coast. The probability is that the force has been submarine, somewhere to the South or South East of Cook's Straits. The straits seem to be the centre along which the electric current proceeded, shaking the land on both sides, but most violently at the south entrance, and gradually diminishing in force as it proceeded to the north. From the Heads round to Cape Terawite [Terawhiti] large rocks were rent, and fragments rolled down and were precipitated into the sea, and on the opposite shore about Cloudy Bay, the ground is said to be cleft in various places.

On the evening of Tuesday the 17th, a light was seen to the North East, and on some of the following nights appearances like the reflection of some powerful light, were seen among the clouds to the south. The appearances, the violence, and duration of the shakings, the constant rumbling sounds beneath the earth, and other indications led to a general belief that a volcano had broken out in some one of the mountains near the centre of the island, and the hope was fondly cherished that if the dormant embers of some smoldering crater had been kindled up and burst forth – if some close up volcano was come again into a state of activity. A safety valve would be opened by means of which the pent up subterranean fires, that by their explosive force are shaking the earth in all directions around us, would be allowed to escape, and the return of similar convulsions in future likely be diminished; but these conjectures have as yet received no confirmation, and it is not at all improbable that the lights were simply atmospheric, - meteoric appearances of some kind, arising from the air being supercharged with electricity: such appearances are common during earthquakes.

DESTRUCTION OF PROPERTY

The destruction of property, has been very great; scarcely a clay or brick building but is either thrown down or rent and shattered so as to be uninhabitable. The Wesleyan Chapel was rent by the first shock, shattered completely by the second, and brought to the ground by the third. Several of the large brick stores passed through the same process. The gaol in a tottering ruin, the roof being supported only by the two side walls, and these very much rent. The Colonial Hospital is in a similar state. Most of the other brick buildings and the stone barracks at Porirua are rent and shattered to a great extent. Almost every chimney in the settlement has been thrown down. Wellington presents a melancholy scene of ruins, - the labour of years has perished in a day. A great number of families are houseless and homeless, living for the time being with their friends and neighbours. Many slept during the danger in tents.

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LOSS OF LIFE

Property is valuable, but we lament to say that what is incomparably more dear to its possessor, life, has been lost in this calamity. During the second great shock, on Tuesday the 17th, Barrack Sergeant Lovel and two of his children were opposite the Commissariat store in Farish-Street, of which he had the charge; the shock was so sharp and sudden, that before he could escape a brick wall fell upon them all; the youngest, a girl, of four years of age, was instantly killed; the other child, a boy of seven, died that same night; and Mr. Lovel himself died on the following Friday, leaving a widow and two young children to lament his sudden and unexpected death. He was 57 years of age. He was buried on the Saturday after, with military honours, and followed to the grave also by a great many of the civilians, in respect to his character and the occasion of his death. But heavy as the hand of God has fallen upon his family, claiming our warmest sympathies, and most earnest prayers, we are happy to say that not another accident has occurred. No other family has had to lament the loss of any of its members, and beyond these three, not another individual has had a hair of his head touched. Another singular preservation of life was experienced on Thursday night, the 25th. The barque *Subraon*, with about forty passengers on board, for Sydney, struck on a rock near the mouth of the harbour; but though completely wrecked, and the danger great, not a life was lost.

THE GENERAL FAST

In a calamity so terrific – coming so directly from the hand of God – in which human power was unavailing – in which prayer and supplication were the only means that could prevail; after the awful shock on Thursday morning, the general feeling of the community was, that a day of fasting and prayer ought to be observed throughout the settlement. The ministers were about to memorialise the Governor to appoint a day, so that all business being suspended, it might be universally and simultaneously observed. But before this was done, they received notice from his Excellency, that he and his Council were about to issue a Proclamation, that Friday, the 20th, should be observed for this purpose, and requesting them to make such arrangements as would be necessary for their respective congregations. Friday was accordingly observed with great solemnity by all classes, Protestants, Roman Catholics, and Jews, as a day of fasting, prayer, and humiliation, and several public services were held in all the congregations. As the Wesleyan, Independent, and Primitive Methodist Chapels were destroyed, the Ministers of the Evangelical Alliance held united services in the Scotch Church. From the great numbers that assembled, and from the apprehensions of danger should alarm be excited, the forenoon service was held in the open air. The ministers of the Alliance held services also at the Hutt, Johnsonville, Karori, and on board the *Subraon*, in which a number of families had taken refuge from the impending danger. The day was fine, the audiences unusually large, and the services solemn and impressive. The Sabbath following was every where more numerous and equally attentive. The existence of the Evangelical Alliance has been of great service and signal benefit at this time.

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PUBLIC PRAYER MEETINGS

Amid the general destruction of property, and the effecting loss of life, it is truly delightful to witness the solemnising and quickening effects produced upon the community by this striking visitation; the careless have been awakened, the slothful have been aroused, and the zealous have been stimulated to increase activity; prayer, earnest and devout, has been all but universal. In town and country, all the places of worship have been opened almost every night for religious exercises, and crowded congregations have engaged in these exercises with the most lively interest. Many who have not for years attended any place of worship, and who rarely, if ever, bowed a knee to God, have been brought to cry like the Philippian Jailor – "What must I do to be saved?" There has indeed been a great awakening – a shaking of hearts as well as of houses. God has been working, and many we hope will be turned permanently to the Lord. As unusual amount of labour and responsibility is devolved upon the Ministers of the Gospel, Sabbath School Teachers, Christian Parents, and all who profess the Gospel, that in their prayers, instructions, and example, they may help forward the work that has been so unexpectedly and auspiciously begun. Come, O breath of the Lord, breathe upon us that we may live!

GENERAL REMARKS

The fearful violence of the shocks, - the ruinous destruction of property – the frequency and long continuance of the danger, inspired universal alarm, and in the case of many besides females, produced an undefined sensation of terror. So exclusive was the concern for life, that the loss of property was scarcely thought of. We should not envy the feelings of those who were not awed and solemnised by such instantaneous displays of unseen and irresistible power – who were not more or less alarmed when the solid earth was not simply trembling, but shaking terribly, as if convulsed with paroxysms, and the strongest buildings rocking like ships in a storm. In these circumstances fear and alarm were certainly natural emotions; and considering the suddenness and greatness of the dangers we can fully sympathise with the feelings of terror, so extensively felt. But in the whole of this visitation, mercy has been so conspicuous over judgement, that we have no sympathy with those who would doubt and despond; we can look at nothing scarcely but the mercy. The distinction between life and property has been so marked, - the destruction of the one and the preservation of the other, appear in such striking contrast, - the upsetting of a single boat has often caused more loss of life, - the spirit of prayer has been so extensively poured out – the ground of our past deliverance, the free mercy of God through Christ remains still the same, - the whole circumstances of the visitation resembles so much the chastisement of a loving Father, rather than the punishment of an inexorable Judge, that we cannot but think that God's preserving us so signally, amid so many dangers, is a token that he has further mercies yet in store for us. If the Lord were pleased to kill us, he would not thus far have accepted our sacrifices of prayer and thanksgiving, nor shown us this deliverance, (Judges 13, 23). If this calamity had been deferred till ten years hence, how awfully disastrous the consequences should have been, when brick buildings would have generally superseded those of wood! If the third shock had come first, how many lives might have been lost! But mercy hath triumphed over judgement! Our prayer is that temporal loss may in every case be spiritual gain, and that the destruction of property may in every case lead to the salvation of souls!

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Source: New Zealand Evangelist, Vol 1, No. VI; December 1, 1848
Location: Wellington, Taranaki, Nelson, Auckland
Keywords: secondary, aftershocks, background, response/recovery

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THE EARTHQUAKES

During the whole of the month slight tremblings and occasionally a rather smart concussion have been felt almost every day, but none of them such as either to cause danger or excite alarm. The earthquake was not felt at Auckland, and only very slightly at Taranaki, Nelson, and other places at a similar distance from Wellington. From all we can learn there appears to be no doubt that the shocks were mostly severely felt at the south entrance of Cook's Straits. We are truly glad to find that our neighbours have either entirely escaped or suffered so much less than we have done. We rejoice for their sakes and for our own. We are thus fully assured that the agency at work has been very limited, and that we must have been very near the centre of the movement. The earthquake that destroyed Lisbon in 1755, shook one fourth part of the continents in the old world, and was felt over a twelfth part of the entire globe. Every well in Britain was affected by it. The earthquake in Chili [Chile] in 1822, by which St. Iago, Valparaiso, and other places were greatly injured, was felt simultaneously throughout a space of 1200 miles from North to South. So far as we heard, not a well in the settlement has been affected by the shocks. And when this earthquake, the most severe that has ever been felt in this district, has been evidently limited in extent, it is strong proof that the volcanic agencies at work are feeble, and therefore such visitations are not likely to occur frequently, and still less probable that the next will occur in the same locality. If the agencies at work had been deep-seated, powerful and violent, their force would not have diminished so much within such a limited space. The volcanic agency resembled a small thunder cloud that may be violent in the locality where its force is expended, but is little felt beyond that single spot. From all our experience we must conclude that earthquakes in this country are limited in effect and fluctuating in appearance, and the next one may probably be in some locality where this one has been very little felt, but as the causes in operation are so much beyond the knowledge of man, and though regulated by laws as fixed and uniform as any other that God has imposed upon matter, yet as these are known only by himself, it is right for us to speak of probable events connected with earthquakes with extreme caution.

GENERAL REMARKS

During the height of the excitement caused by the earthquake, when life and property were in so much danger, a feeling of despondency came over the minds of many. It was thought the settlement was ruined for all time coming. A few persons left this place partly on that account, and it is possible that when accounts of this visitation reach home, some intending emigrants may be deferred from coming to this settlement, but if the earthquakes are their only obstacles, let them not be deterred for a single day on that account, unless they are afraid to come to a place where God's mercy has been pre-eminently displayed in the preservation of it, where he has kept us as in a hollow of his hand. With no wish to shut our eyes on the losses we have sustained, or the danger we have escaped, we see no grounds for misgivings for the future on account of any calamity that comes directly from the hand of God. We fear no evil

but sin, but we fear its daily ruinous effects upon the community far more than the occasional calamities sent by God's providence. We dread the effects of intemperance, for example, for one year, more than the earthquakes of half a century. In times like the present we are apt to look at the dark side of the picture; this is not right; we ought to look at both, at our advantages as well as our disadvantages, our fair prospects as well as our heavy losses. We may be over-sanguine, we may be too easy about the future; we certainly have no sympathy with those who would doubt and distrust the mercy and goodness of God, as revealed in his word and displayed by his son. We are not

> "over exquisite
> To cast the fashion of uncertain evils;
> But when an equal poise of Hope and Fear
> Does arbitrate the event, our nature is
> That we incline to Hope rather than Fear."

Earth is not Heaven, New Zealand is not Paradise. Every place has its drawbacks; some of one kind, some of another, but we have certainly not more here than falls to the average share of other places that have perhaps fewer advantages. We have a soil containing the richest elements of fertility; a climate salubrious to a proverb; water in abundance, the best and purest on earth; wood in plenty and variety, droughts are unknown; snow is seen only on tops of the highest mountains; frost is rarely seen, and then only slightly felt; we are equally removed from the extremes of heat and cold; thunder and lightening are rare; it is not oftener than once or twice in the year that we have a thunder storm, and then the clouds are so high and distant that when the peals roll over our heads, there is more of the sublime and less of the terrible than in almost any region of the globe. The weather is, upon the whole, vastly better for most occupations than in Britain; a fortnight or three weeks will often cover all the time lost by bad weather in out-door occupations from a whole twelvemonth.

We have often high winds, occasionally heavy rains, once or twice a year a slight earthquake, but so slight as often not to be observed; we have had an alarming and destructive visitation, and we may have a return of similar kind, but this is an extraordinary and not a common occurrence. All the danger and loss of life and property have been caused by the falling buildings. In all countries men learn to construct their dwellings on the principles best adapted to resist the most hostile elements around them. The three principal forces to be resisted here in house building are high winds, battering rains, and earthquakes; the last is the force most difficult to be estimated; but from all that can be gathered from experience, observation, and tradition respecting the causes now in operation, there is nothing serious to be dreaded in the future; and if buildings are kept low, sufficiently braced and bound together, and kept always in a proper state of repair, we need dread very little real danger from earthquakes, but in this way safely commit ourselves to the care of a wise, watchful, and merciful providence. Let no one, however, suppose, because all danger from earthquakes seem to be over, that they may therefore return to wickedness or continue in sin; for no law in the universe is more fixed and certain in its operation, than that sooner or later sin is always followed by suffering and misery, while holiness always leads to happiness and joy.

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Source: New Zealand Evangelist Vol 1, No VII; January 1, 1849
Location: Wellington
Keywords: primary, secondary, mainshock, response/recovery

p.174
SERVICES COMMEMORATIVE OF THE EARTHQUAKES
The 16th October being the day in which the first of the severe shocks of earthquake was felt last year; on the 16th ult., the Ministers of the Evangelical Alliance in Wellington, held three united services, commemorative of these alarming events; in the forenoon in the Wesleyan Chapel, in the afternoon in the Primitive Methodist Chapel and in the evening in the Scotch Church. The services were numerously attended; greatly more so than was anticipated; and all who were present engaged in the various exercises with the deepest interest and the most marked attention. Similar services were held in the Hutt.

Most of our readers are aware that there exists in this settlement, as there does in many other places, the scanty remains of a very old religious, or rather non-religious, sect. Antiquarian writers have traced its existence to a very early period. One old ecclesiastical historian has shown, that it was numerous and powerful among the antediluvians. Some infer that Cain was its founder. A very ancient Jewish or Arabian poet, who flourished long before either Homer or Hesiod, has preserved what appears to be one of the leading articles of their creed; possibly it may be a fragment of one of their hymns:

"They said unto God, depart from us:

What can the Almighty do to us?

What *profit* should we have if we *pray* to him?

It is certain from the remains of Egyptian history that have come down to us, that the Pharaoh who was drowned in the Red Sea, was a leading member of the sect. One of the best known writers of the first century speaks of them, as familiarly known in his day, by the name of *Scoffers*; and a contemporary writer calls them by the name of *Mockers*. It is possible that these names may be given to them by their enemies, as nicknames, like *Puritan* and *Methodist*; but certain it is they have been long and extensively known by these and other synonymous appellations. They have been sometimes more, sometimes less prosperous, but they have never been extinct; and the Church of Rome herself has not been more distinguished for unity of sentiment and uniformity of practice.

One of the most marked heresies that ever sprung up among this fraternity, in this part of the world, was in October 1848. During the continuance of the *quakes*, from being *Scoffers* and *Mockers* they became, all at once literally *Quakers*. We have not heard that they wore broad hats, but it is well known that they assumed very grave looks and put on very long faces, and that as often as the earth shook they quaked. But the times are changed and they are changed with the times. A few of them persevered in their heresy and finally joined the Bible sect; but their numbers were comparatively small. The cause of that change was from the earth, and

like everything terrestrial it was passing. They continued to look down not up – to earth and not to heaven, and when the earth became stable they stood firm, and when she smiled they again laughed. They are now heartily ashamed of their short-lived heresy, and most devoutly zealous to convince the world, that although to err sometimes, is human; yet they are as orthodox in sentiment, and as consistent in practice, as any of their forefathers ever were, since the times of primeval antiquity.

It is needless to say, that the members of the Evangelical Alliance have no sympathies in common with this sect. We are no alarmists. It was from no wish to excite alarm – from no special fear of an immediate return of such a catastrophe, that we observed the 16th of October, partly as a day of humiliation for sins, and partly a day of thanksgiving for mercies. It is not that we regarded the observance of that day as of positive divine appointment; but as the return of the year brought naturally a vivid recollection of the scenes through which we had passed, it appeared to be a fitting time, to revive the salutary impressions produced by these events, and to revise the important lesson that God had taught us then by the voice of providence.

We know perfectly well that earthquakes, volcanic eruptions, thunder storms, cholera, fevers, and all these terrific phenomena, are the effects of natural causes. We can discover more or less distinctly the operation of the physical laws on which they depend. But we know also, that there is mind as well as matter – that mind is immeasurably superior to matter – that there is a system of laws for the regulation of mind, as well as for the regulation of matter, - that the governor of the universe is an intelligent Being – that the last link of the chain of both physical and moral causes terminates with him, - that God secures submission to his physical or natural laws by preventing disobedience, and to his moral laws by punishing disobedience – that as matter is made subservient to mind, so when the laws of matter traverse the laws of mind, the less must yield to the greater. We can see the lower links of the chain of both moral and natural causes, but not the higher. We know that prayer is an important link in the chain of moral causes. Neither prayer nor any secondary moral causes, affect the secondary natural causes; but prayer affects the Great First Cause, and he affects the secondary natural causes. Prayer does not affect the electric fluid, or the metallic bases, and hence we do not pray to the lightning or the earthquakes; but prayer as a moral cause, by divine appointment, affects Jehovah; He controls electricity and other agents, and, in this way, prayer tells indirectly but no less powerfully upon earthquakes and all the phenomenon of nature.

We know from the Bible that God employs all these agencies, as he sees meet, for the punishment of sin (see I Kings, viii, 33 etc.). We are distinctly assured that the flood, brought about by purely natural causes, was occasioned by the heinous sins of that depraved and wicked generation. Ten righteous men would have saved Sodom, although the fires of Heaven above it required only a spark to ignite them; but as there was only one righteous man, his righteousness saves only himself and the least guilty part of the family.

We believe in the Bible; we have unlimited confidence in prayer. We know that believing prayer – prayer in the name of Christ – honest, earnest, persevering supplication, will either avert evils; or will protect life and property amidst divinely sent judgements; or cause the

most terrific calamities to work together for good – for securing the eternal salvation of the supplicants; so that temporal loss will become to them spiritual gain.

It would be not only unscriptural, as the merest child knows, but highly unphilosophical not to pray, - as unphilosophical here not to pray for preservation from earthquakes, as to neglect the most obvious principles of architecture in the construction of our buildings. The one is a protection against earthquakes only, the other is a protection against evil of every kind. God has many and mighty agencies at his command, with which to punish a guilty community, - but prayer and piety are invincible, because they are divinely appointed means of preservation. – "In six troubles he shall deliver thee; yea, in seven there shall no evil, touch thee".

NEW ZEALAND JOURNAL (Published in London)
Source: *New Zealand Journal*, June 16, 1849
Location: Wellington, Nelson
Keywords: secondary, building damage, response/recovery

THE LATE EARTHQUAKE

Whenever any unusual calamity befalls a community it is the height of folly on the part of a public journalist, even though he be interested in that community, to gloss over the facts. When the intelligence of that earthquake in New Zealand reached us, through the medium of the Singapore papers, we considered the narration of disasters enumerated as overcharged, but forbore to comment either one way or another on the facts stated. In the course of a few weeks we received our usual advices from the Colony, which, contrary to the impression first produced, assured us that the damage done was trifling, and that in fact the worst disaster that had befallen the Colony was the maudlin despatch of Lieutenant-Governor Eyre, who thought it fit to attach the weight and authority of his position to sentimental colourings of the event, produced only through the medium of his own excited imagination. He gravely assured the Government that Wellington was in ruins, without any chance of recovering its pristine prosperity. Our correspondents, men of cool heads and sound judgement, assured us that the damage was chiefly confined to the Government and other public buildings, which having been erected by contract, with no very efficient supervision, were for the most part built of half-burnt bricks and cemented with *mud* (!) in place of lime; the proof lying in specimens of this novel cement which were sent home for the purpose of proving statements which might otherwise have been deemed incredible. The Wellington papers assured us that Nelson was also a partaker of the general calamity to an extent at least equal to that of Wellington. Our Nelson friends told us that the damage done to the whole district amounted to the sum of *thirty pounds*. In the mean time, the despatch of Lieutenant-Governor Eyre was making the round of the Indian and China papers, and it is no doubt believed from Lahore to Hong Kong that not a vestige of the once flourishing settlement of Wellington remains. So great may be the mischief produced by a few strokes of an inconsiderate pen. Fortunately, however, for the reputation of the English press, the plain facts of the case reached England at the same time as the Lieutenant-Governor's ill-judged despatch, and the result was, luckily for his own reputation for sagacity, that few papers at home took the slightest notice of his heightened

colouring – preferring the plain statements of Colonists to the semi-poetical effusions of a gentleman who evidently wrote under the idea that his despatches would become equally immortal with his other works; a conclusion which is no doubt based on reality.

One of our Wellington correspondents threw out a shrewd hint that if the Lieutenant-Governor had displayed only half the energy in looking after the efficient carrying out of the contracts for Government buildings that he displayed in chronicling the mishaps consequent upon their fall, the greater portion of the mischief would never have happened. This view of the matter is certainly warrantable, and it is unquestionably hard upon the Colonists that they should suffer from inefficient buildings, for which they will have to pay over again, whilst at the same time the fall of edifices which were not built to stand is made the stumbling-block of their prosperity by their own ruler, whose duty it was, personally, or by his officers, to see that the public works of the Colony were properly constructed.

The truth of the disaster is at length placed beyond dispute, by the united voice of the Colonists themselves. No sooner had the Lieutenant-Governor's despatch reached Auckland, than the settlers there, laying aside all that petty rivalry which is too often the bane of colonial society, and remembering only that they were Englishmen and fellow-colonists, subscribed a sum of money for the relief of their (as was believed) destitute brethren at Wellington. With praiseworthy promptness, the amount subscribed was forwarded to the latter, to be distributed as the urgency of the occasion might require. If the Wellington colonists were surprised at receiving contributions for which there was no occasion, their friends at Auckland must have been no less surprised at having their subscriptions returned to them as altogether unnecessary; the refusal to accept them being accompanied, as was most proper, with expressions of gratitude for their promptness in alleviating the suffering which the Lieutenant-Governor's despatch had led them to infer.

Previous to the return of the subscriptions, a public meeting was held in Wellington, for the purpose of embodying the thanks of the community for the generous support which had been tendered by their brethren in the North. This meeting was attended by the heads of the various religious sects in the Colony, and it is to these that we chiefly call attention, as coming from men above the suspicion of deceit or concealment. The chairman of the meeting was the resident minister of the Church of England, who forcibly urged the expression of thanks to their northern friends. He was followed by the Jewish Rabbi, whose opinion was, that no disaster had occurred, the relief of which was not within their own power. The Wesleyan minister concurred, and was followed by the Roman Catholic priest, who felt equally grateful as though there had been any real necessity for the Auckland contributions. The minister of the Church of Scotland gave it as his opinion, that, "though an erroneous impression had evidently been produced as to the actual circumstances of the case," their thanks were no less due to the community which had not only expressed their sympathy, but extended their aid, under the impression that it was promptly required. The minister of the Congregationalist Church at once came to the point: "*the cases of disaster were so few, that they were called on*

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to return the money". He was followed by Dr Featherston, a physician residing in Wellington, who at once stated that "*the money had been raised under the influence of grossly exaggerated representations*" and in these opinions Mr. Fox and the meeting agreed, and the amount was returned. This is the end of the Wellington earthquake, and it is [a] matter of regret that the Lieutenant-Governor did not think proper to attend for the purpose of explaining the part which he took in those representations. The spirit with which the returned contributions were received by the contributors, will be found in another part of our paper, and is equally creditable to the donors with their prompt liberality.

NEW ZEALAND SPECTATOR & COOK'S STRAITS GUARDIAN (Published in Wellington)

Source: New Zealand Spectator and Cook's Straits Guardian, October 18, 1848

Location: Wellington, Hutt Valley, Porirua

Keywords: primary, secondary, mainshock, aftershocks, building damage, atmospheric effects, response/recovery, casualty

[October 18, 1848]

Within the last few days this settlement has experienced a severe and terrible visitation of Providence. From Monday morning last up to this morning (Wednesday), a succession of earthquakes more or less violent have occurred which have occasioned a great destruction of property, and produced a very general feeling of alarm. In relating the occurrences of the last few days, we shall best discharge our duty by giving a plain statement of facts and thus counteract circulation of incorrect and exaggerated reports. Before describing the effects of these convulsions of nature, however, it may be necessary to say a few words on the previous state of the weather. During Monday the 9th instant, there was a strong south-easter accompanied by very heavy rain, and though towards the middle of the week there intervened a few days of fine calm weather, on Saturday last another south-easter occurred of equal violence with the former one which continued the two following days accompanied also by very heavy rain, so much so that the quantity of rain which has fallen during the last week amounted to ten inches, or more than three times the quantity of the whole previous month. At about twenty minutes to two o'clock on Monday morning, a most severe shock of an earthquake was experienced which lasted for a space of nearly a minute; the direction of the shock appeared to be north and south, the motion was horizontal and undulatory until towards the conclusion, when it seemed to have an upheaving or vertical motion; this was followed at an interval of half an hour by another shock not so intense as the first, and during the subsequent nineteen minutes a succession of severe shocks occurred with lesser ones at intervals, in fact during the whole of this period, the ground appeared to be in a state of oscillation. Nearly the whole of the night the south-easter prevailed, so that the fury of the wind added its force to the destructive agencies at work. When it was daylight it was found that several of the brick buildings at Te Aro and in other parts of the town had been seriously injured by the first shock which had caused the greatest amount of damage; among the buildings which had suffered most was the Wesleyan Chapel, this building was of brick and

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cemented; the north elevation consisted of four pilasters with a central doorway and a large window on either side, the pilasters were surmounted by an entablature and pediment, the weight of which acted as a lever in bending forwards the wall when in motion from the earthquake, separating it from the roof and causing it to overhang as much as to render it necessary to be immediately taken down. The greater part of the chimnies in different parts of the town were also either thrown down or so much cracked and twisted as to render it necessary to take them down. The damage was almost entirely occasioned by the first shock which was the most severe that had been experienced in this settlement. The ships in the harbour equally felt the influence; the sensation experienced on board H.M.[S.] *Fly*, is described to have been as though the vessel suddenly grounded, the shock was felt most in the fore part of the ship and all the men had ran up on deck. During Monday a succession of smart shocks occurred, one at a 1/4 to six in the morning, another at 12 o'clock, and another about half past three p.m., during the night some lighter shocks were felt, and on the following morning a severe shock at about half past seven, while during the whole of this time a continuous tremulous motion of the earth was distinctly perceptible. On Monday the wind moderated, and during the afternoon and night and on Tuesday it became perfectly calm. On the afternoon of that day (yesterday) at twenty minutes to four a severe shock occurred, followed in quick succession by another of about half a minute's duration; this last was as severe as that on Monday morning, but more destructive in its effects, the motion appearing to be more vertical. This completed the damage occasioned by the former shocks, very few brick buildings escaping its destructive effects. The buildings rocked to and fro in a fearful manner. All the brick stores at the head of the Bay were more or less damaged, the walls being either thrown down altogether, or rent in different directions, and thrust out from the perpendicular. All those buildings that had been injured by the former shocks were quite destroyed, while those which had previously escaped were now reduced to the same ruin. Among the latter is the Colonial Hospital, which has only recently been completed, and which was so injured as to render it necessary immediately to remove the patients, who were taken to Government House, where they will be accommodated for the present. The walls of the goal also, and of a large building at Thorndon, used as a Barrack for soldiers, are so cracked as to be no longer habitable. Nearly all the chimneys which had previously escaped were either thrown down, or more or less twisted and injured. The walls of the Wesleyan Chapel were split in every direction, so as completely to destroy the building. A man who was employed in nailing up some boards against the end of the roof, which was open by pulling down the pediment, was in imminent danger of being thrown to the ground; he was, however, providentially enabled to preserve his hold until the shock was over, when a ladder was placed against the building, be means of which he descended from his perilous situation. We regret to have to add to this destruction of property the loss of life. Barrack Serjeant Lovel and his two children, who were passing down Farish-street from the Government store at the time were buried by a mass of falling wall, one of his children, a girl of eight years, was killed on the spot, the other, a boy about four years old received so many severe injuries that he died about eleven o'clock last night; Sergeant Lovel himself was also very much bruised, his left leg being much injured.

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Two severe shocks were experienced in the night, one at a quarter to eight o'clock, the other at twenty minutes to one this morning, with several slighter shocks at intervals, the last one was at ten minutes to two this afternoon. Nearly all the shocks were immediately preceded by a hollow rumbling noise. This morning the tide rose to an unusual height, overflowing part of Lambton Quay and all those sections at the head of the Bay fronting the water and immediately adjoining the swamp. During Monday and Tuesday night a long streak of pale light was observed by several persons. It appeared to be settled at a very great distance, and in a Northerly direction.

The effects of the earthquake appear to have been most violent at Te Aro and Thorndon, and on brick buildings of two storeys. With the exception of the chimnies, the buildings along Lambton-quay the buildings have not suffered so severely, those also which are on more elevated ground appear to have escaped with less injury, and several brick buildings of only one storey in height have been either but slightly damaged or are quite sound, while all the wooden buildings are perfectly uninjured. The preceding account has only reference to the town of Wellington, but we understand that the earthquake was as severely felt at the Hutt and Porirua, nearly all the chimnies being thrown down in the Hutt, while the stone barracks recently erected at Porirua have been so shaken as to be quite uninhabitable.

We cannot conclude this hasty and imperfect sketch without acknowledging in this Visitation the finger of God:- "It is the Lord's doing, and is marvellous in our eyes." It is a calamity against which no prudence could guard, and to which, as Christians, we must submit with becoming resignation, having deep cause for thankfulness that amidst this destruction of property, whether occurring, as at first, in the dead of night, or yet later, in the face of day, it has not been attended with greater loss of life.
The publication of the Spectator has been unavoidably delayed till a late hour to-day in consequence of the greater part of the type set up for this number being thrown down and disarranged yesterday afternoon by the violence of the shock of the earthquake.

The ministers of the Evangelical Alliance in Wellington have called a meeting of the inhabitants this evening, at six o'clock, in the Scotch Church, for the purpose of joining in prayer to Almighty God to avert, in his mercy and goodness, the awful calamity with which we have been so severely visited.

In consequence of the damage sustained by the Military Hospital, the patients were removed yesterday evening to the Barracks at Mount Cook. The building was of clay, and the walls were broken in every direction.

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An inquest was held this day at the "Ship Hotel", before Dr. Fitzgerald, Coroner, on the bodies of the two children of Sergeant Lovel, to whose death we have previously alluded. - A verdict was returned of "Accidental Death".

Source: New Zealand Spectator and Cook's Straits Guardian, October 25, November 8, and November 15, 1848.
Location: Wellington, Nelson, Marlborough, Wanganui, Auckland, at sea, Otago
Keywords: primary, secondary, mainshock, aftershocks, building damage, ground damage, faulting, atmospheric effects, response/recovery, volcanic effects, casualty

[October 25, 1848]
In the brief and imperfect account published in last Wednesday's Spectator of the damage occasioned by the succession of earthquakes with which this settlement has been visited, we hoped we had endured the worst, - that this fearful calamity had passed away, - but alas! the end was not yet - on the following morning [19th] at three minutes past five the inhabitants of Wellington were aroused from their slumbers by a shock still more violent and destructive in its effects than any of those which had previously occurred. The first impulse of the majority of persons, after having assured themselves of the personal safety of their families, was to rush out and see the extent of damage which the shock had occasioned. A melancholy scene presented itself to their view; all those buildings which had suffered from the previous shocks were still more terribly shaken or completely destroyed. The Wesleyan Chapel and Messrs. Rhodes's store were thrown to the ground, the end walls of Messrs. Ridgways' and Hickson's store, and the Ordnance store, both lofty and substantial buildings, were also thrown down and the remaining walls rent in various directions; the end walls of the gaol were destroyed, and the boundary wall rent from top to bottom, and the walls of the Colonial Hospital were broken and partly thrown down. We need not enter into further detail, on every side a scene of ruin presented itself. Several cracks or fissures were observed in the earth, the most remarkable being on the beach on Thorndon Quay a short distance beyond the Cottage of Content. During the following twenty-four hours several shocks were felt, the most severe being at half past seven a.m., and at ten minutes to twelve p.m. During Wednesday night and the following morning a violent south-east gale prevailed with rain, which continued during a great part of the day. Very shortly after the violent shock above described, his Excellency the Lieutenant Governor repaired through the town, suggesting such measures as were necessary for the safety and assistance of the inhabitants. The New Church at Te Aro and the Scotch Church were thrown open as places of refuge for the houseless; and his Excellency offered the use of Government House to those who wanted shelter. A proclamation was also issued appointing the following day (Friday) to be observed as a day of humiliation and public fasting. During Thursday night, which was calm, a fiery glare, apparently the reflection of some stronger light was observed in the Heavens towards the South, which lasted from half-past eight to twelve o'clock, becoming more faint towards the latter hour until it disappeared altogether. A similar appearance in the sky, in the same direction, was observed by Capt.

Crow of the Clara between four and five o'clock on Wednesday morning. During Friday thirteen successive shocks, more or less severe, were felt with slight intervening shocks at intervals. Several slight shocks were felt on Saturday and Sunday, the strongest being at twenty minutes to twelve on Sunday night. Slight shocks also occurred on Monday, the strongest being at 11 minutes to 10 at night. On Monday and Tuesday's apprehensions of further danger were so far removed, that preparations were commencing in different parts of the town, to clear away the rubbish of the fallen buildings, to secure those which were standing, and otherwise to repair the damage caused by the earthquake. On Tuesday afternoon, however, about six minutes past two o'clock, four severe shocks occurred within the space of three minutes, the second being nearly as violent as the most severe shocks which have previously been recorded. Since that period up to 6 o'clock this morning (Wednesday) slighter shocks have occurred, on the average at an interval of every ten minutes, being almost invariably preceded by a hollow rumbling noise, in many instances this noise was heard without being followed by a shock, while a continuous trembling of the ground was felt during the whole interval. Thus from Monday morning the 16th inst. to this morning, a period of ten days, there has been a constant succession of earthquakes, some of them of a very violent kind. On Wednesday night and during part of Thursday, as has been previously noted, there was a very strong south-easter accompanied with rain, but during the remainder of the period that weather has been remarkably fine and calm. The shocks, as in the former part of the week, have been felt with the greatest severity on Thorndon and Te Aro flats, the houses on the higher ground having sustained much less damage, while the wooden buildings have escaped altogether without injury.

Private accounts to the 19th inst. received from Nelson, including the interval during which the three most severe shocks were experienced in this settlement, state the damage there to be comparatively trifling, some of the brick chimnies having been thrown down and a few of the brick buildings having been more or less injured. The building which had suffered the most is a brick house built by the late H. A. Thompson, Esq., which had been entirely shattered, but we understand it had been built on made ground, and had previously several large cracks in the walls. The most severe shocks are stated to have occurred about the same time with those in this settlement, and the impression of the writers appeared to be that they proceeded from the North Island. At Cloudy Bay the shocks appear to have been more violent, the chimnies of the houses having been all thrown down, and the cutter Fly which was at anchor having felt the shocks very severely. At Wanganui, according to the report of persons who have just arrived overland from that district, its effects have been less felt, and the damage experienced there has been very trifling.

We are still ignorant of the centre of disturbance from whence have proceeded these violent convulsions of nature, it was at first conjectured that Tongariro was in active operation, but up to Sunday last there was no appearance of irruption about that volcano: as observed by persons travelling along the coast. The master of the Bee, which arrived on Monday, in passing through the Strait, observed no indications of irruption either about Tongariro or

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Mount Egmont; it is therefore supposed that some volcano must have broken out on the East Coast.

Since the commencement of this visitation several persons who imagined there was greater security from danger on the water than on shore, have repaired at night on board the vessels in the harbour. Captain Mills, of the Subraon, has been particularly active in rendering assistance, and his vessel has been crowded every night by persons who, labouring under this impression, have sought a refuge there from impending danger. An address acknowledging his kindness which has been numerously signed, and which we have great pleasure in publishing, has been presented to him by the settlers accompanied by a purse of upwards of £70 to purchase some durable testimony of their grateful appreciation of his services.

Friday was generally observed throughout Wellington as a day of public humiliation, and his Excellency entirely consulted the feelings and wishes of the inhabitants in issuing the Proclamation for its observance. The services held during the day by the different ministers of religion were attended by crowded congregations humbling themselves before the mighty hand of God, and acknowledging his many mercies in the midst of this grievous tribulations. Divine service has also been performed twice a day by the Rev. R. Cole at Te Aro Church every day since Thursday last; and religious meetings have been held at the Scotch Church by the Ministers of the Evangelical Alliance.

A meeting of merchants and other persons engaged in business was held at Mr. Waitt's store on Saturday last the 21st Instant, for the purpose of adopting such measures as were necessary in the present crisis. W. Hickson, Esq., was called to the chair, when it was unanimously resolved to request his Excellency the Lieutenant-Governor to enforce such measures as would prevent persons leaving the colony without giving a sufficient previous notice of their intention, that he would be pleased to provide for the public safety by the appointment of a Board of Survey to adopt such precautions with regard to those buildings which have been injured by the late earthquake and were standing in a dangerous state, as might be deemed expedient; and also that the disposable troops might be employed in the removal of such buildings as were declared to be in a dangerous state and affecting the safety of the public, the troops employed in this service to be remunerated at the usual rate by those to whom the buildings belonged. Messers Hickson and Rhodes were appointed a deputation to wait upon his Excellency with the resolutions of the meeting, and we understand that a favourable answer was returned to the deputation: A notice was posted at the Custom House on Monday morning to the effect that a list of the names of the passengers and persons on board (a copy of which is to be affixed to the door of the Custom House) would be required from the captain of each vessel 48 hours previous to a clearance being given; a Board of Survey has been appointed, and the officer commanding the troops in this Province has consented to the employment of the military in the removal of dangerous buildings, subject to certain limitations necessary for the good of the public service.

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Owing to the confusion into which the types of this office were thrown by the earthquake of last Thursday, together with the subsequent excitement which prevailed, it was found impossible to publish the Spectator as usual on Saturday last; by a great effort, however, we have succeeded in bringing out the present number at our usual time of publication.

The Clara arrived on Wednesday from Auckland. The Auckland papers received by this opportunity contain no news of any interest. His Excellency the Governor-in-Chief arrived there October 3rd. The Acheron was still at Sydney, and the Dido, it was reported, would shortly sail for England. During the passage Capt. Crow did not observe any natural phenomena which could lead him to infer the active operation of earthquakes; the only remarkable occurrence was the bright light on Wednesday morning previous to his entering the harbour.

The Sarah Ann arrived on Wednesday last after a tedious passage from Otakou [Otago], where she left the Harlequin and Supply on her departure. The Sarah Ann was about twenty miles off Cape Campbell in Monday morning at the time of the first great shock, which was felt on board very severely. When off Entry Island on Tuesday night, the 17th instant, the Master of the Sarah Ann saw the light mentioned in "our" last number, the bearing of the light was in a north easterly direction.

The Blundell has a quick passage of two days from Otakou. Up to the time of her leaving no shocks of earthquake had been experienced in that settlement.

Two whaleboats and a canoe arrived this morning from Queen Charlotte's Sound, which they left yesterday. We understand from the crews of these boats, who are natives, that the earthquake has been felt very severely in that part of the Middle Island.

We regret to state that Barrack Serjeant Lovel died on Friday afternoon of the injuries he had received on the previous Tuesday. He was buried with military honours on Saturday afternoon. The coffin, which was preceded by the firing party with arms reversed, was borne by soldiers, and followed by a company of the 65th regiment, the band of the regiment playing the "Dead March in Saul". His Excellency the Lieutenant-Governor, Lieut. Colonel McCleverty, Capt. O'Connell Brigade Major, and several officers of the 65th regiment, joined the mournful procession; as did also the Ministers of the Evangelical Alliance, and a considerable number of settlers, by whom the deceased was generally respected. The deceased entered the 43rd regiment as a volunteer in the year 1810, and served in the

Peninsular war to the termination of hostilities in 1815, and had seen a good deal of service, having been present at the battle of Vittoria and several other engagements. He was transferred from the 43rd to the 57th regiment, of which he was Serjeant-Major up to the time of his discharge in 1835, when he received a good service medal. He was then appointed Barrack-Serjeant at Malta, and was afterwards transferred to Sydney in the same capacity, where he remained until the close of last year, when he received the appointment of Barrack-Serjeant at Wellington and arrived in this settlement on last Christmas Day. He has left a widow and two children in Wellington, and a son and daughter at Sydney who are grown up, the latter is married to the Serjeant-Major of the 99th regiment. We understand that a subscription has been commenced in favour of his widow, and that subscriptions will be received by J. O. Hamley, Esq., Barrack Master.

Notwithstanding Friday was the concluding day of the feast of the tabernacles, wherein no fast is ever held by the professors of the Hebrew faith, yet in consequence of the fearful visitation wherewith it has pleased the Almighty to afflict this colony, they abrogated their holiday, and humiliated themselves before their Creator fasting from even until even, and uniting with their brother colonists in fervent supplication to Him, to withdraw the terrors of his Omnipotence from them all, and to save them in his all beneficent mercy; for which purpose they met for Divine worship at the house of Mr. Samuel, Kumutoto, where an appropriate sermon was delivered from the first and twelfth verses of the 189th Psalm. - Communicated.

We have received some valuable observations and suggestions, accompanied with extracts giving an account of previous earthquakes, having for their object to guard the settlers against accidents during the recurrence of the successive shocks of earthquakes, and shewing that the least danger is to be apprehended on the high ground in the neighbourhood of the town, and at a distance from the sea. We have already in our previous communications had occasion to remark; that the buildings on the low ground have suffered most, and those on the high ground have suffered least from this calamity. We refrain at present from publishing account of the earthquakes which have occurred in other countries in order to prevent unnecessary alarm; but the following practical directions are so valuable, that we cannot refuse ourselves the pleasure of publishing them: - [not included here]

Earthquakes felt on board the *Fly* – extracts from meteorological tables of Captain Oliver. [Note: only earthquake information is included here. Further the information is taken from several issues of the *Spectator* (October 25 and November 4). Note also that times such as 2.5, 8.8 etc are likely to 2.05, 8.08, etc.]

[October 25 issue]

Monday 16th ...	A.M. 1.40 severe shock; 3.0 slight shock
Tuesday 17th ...	P.M. 3.40 severe shock; 7.50 shock
Wednesday 18th ...	A.M. 0.5 two shocks
Thursday 19th ...	A.M. 5.3 very severe shock; repeated shocks
Friday 20th ...	A.M. shocks during day
	A.M. 11.10 shock
Saturday 21st ...	A.M. 3.35 to 3.40 shocks of earthquake
	9h. shock of earthquake
	P.M. 8.55 and 9.50 shocks of earthquake
Sunday 22nd ...	A.M. 10.0 slight shock
	P.M. 3.55 shock

[November 4 issue]

Monday 23rd ... P.M. [sic, possibly meant to be AM] 1.15, 1.30, 3.35 shocks of earthquake

P.M. 0.25 a shock, 2.0 a shock, 10.20 a slight shock

Tuesday 24th ... A.M. 2.25 a slight shock,

P.M. shocks at 2.5, 2.30, 3.11, 3.25, 4.0, 4.40, 5.40, 5.45, 6.0, 6.12, 6.33, 7.0, 7.55, 8.8, 8.20, 8.45, 9.0, 9.5, 9.15, 9.20, 9.49, 11.15.

Wednesday 25th ... A.M. shocks at 12.5, 12.30, 12.40, 12.50, 1.10, 2.20, 2.30, 2.55, 3.50, a severe one at 5.20, slight one at 7.9.

P.M. slight shocks at 8.15, 9.5, 11.5.

Thursday 26th ... P.M. 5.50 a severe shock, shocks at 8.42, 9.51, 10.5, 10.30

Saturday 28th ... A.M. a slight shock 12.55, rather severe shocks at 1.30, 3.35.

Sunday 29th ... A.M. slight shocks at 1.35, 2.30, 3.0, 3.10.

[November 8, 1848 issue]

Extract from meteorological tables kept at Karori.

"Tuesday 31st ... one at 3 p.m. and another at 7h.30m p.m."

[November 15, 1848 issue]

Meteorological table on board H.M.S. *Fly*.

Tuesday 31st ...	P.M. 7.30 severe shock of an earthquake.
Friday 3rd ...	A.M. shocks of earthquake 3.5, 3.10, 3.50.
	P.M. 7.25 slight shock; 11.10 slight shock.
Sunday 5th ...	P.M. slight shock of an earthquake.

Source: Wellington Spectator and Cook's Straits Guardian, December 6 and December 9, 1848
Location: Wanganui
Keywords: primary, mainshock, aftershocks, background, uplift/subsidence, ground damage, building damage

[December 6, 1848]
The following extract from a letter from Wanganui gives an interesting account of the effects of the recent earthquakes in that vicinity: -

You ask me for some particulars relative to the late shocks at Wanganui; compared with those you have experienced ours have been trifling; none of our chimneys were thrown down or any of our buildings injured, and it is remarkable that although my chimnies are full [sic] thirty feet high, and rocked to and fro in a very violent manner, there is still not even the trace of a crack in the plaster to mark the shaking they have had. Our principal shock commenced about half-past two on Monday morning; the movement was very violent, and from the NW or WNW: it was like a wave rolling on its course, but it left a tremulous lateral motion, which continued for a long time, and resembled the quivering of a dish of jelly; about four minutes after the first we had another violent shock, and I think I may say it was nearly an hour before the movement of the earth ceased to be perceptible; on the Tuesday afternoon we had another sharp shock, and about five o'clock on the Thursday morning a third. We have however had a series of minor ones, but too gentle to require notice. It is our general opinion that the earthquakes of 1843 were more severe; this appears to be established by their effects; then nearly all our chimnies were thrown down, the gable end of the church, which is brick, fell; the earth opened in fearful rents, emitting noxious gases, which caused much sickness: at Rangitikei also a cliff overwhelmed a house with its inmates, the land on the S[outh] side of the Wanganui was elevated, and the channel of the river in places was considerably deepened. But these late shocks have likewise occasioned several singular changes which are worth recording; on the S[outh] side of the Bluff near the mouth of the Wanganui a rock was thrust up in the deepest part of the channel, which is now 18 inches above the low-water mark, a shoal has arisen where there was a depth of 6 feet, and a long spit of land extends from Wai Puna to Wilson's ditch, where formerly there was deep water. The gunboat wharf also has perceptibly sunk, and a row of posts near the gun-wharf has been thrust out full 3 feet. Several fissures in the river were also noticed after the shocks, which have since been filled up; the beacons also at the heads are now much out of the perpendicular, and a large tree which formerly was embedded in the clay, and was used as a landing place, was removed several yards from its position, and carried further up the stream. In a recent visit up the river I noticed a great number of landslips, but none of any great size. The teacher of Hoperiki however had a very narrow escape; he was sleeping at the root of a large rata tree; he was awoke by the tree moving in an extraordinary manner, and immediately jumped up and ran away; he had only just time to escape its falling on him, and had not time even to carry away

his garments with him. I have noticed that all our shocks come from the same quarter, which leads me to suppose they radiate from the some centre seated in the sea; the channels of the rivers are evidently fissures formed in the upheavement of the land, the shocks are frequently felt in their vicinity, frequently they are not perceived at a little distance either on one side of the other; the entire course of the Wanganui presents a series of these upheavements, the country laying in stages from the sea to the central plains of Taupo; every little stream which falls into the Wanganui is but a lateral fissure marking the extent of one upheavement, and one end of the strata being elevated as much as the other end is depressed, the part lifted up being invariably opposite the point from whence our shocks still proceed".

[December 9, 1848]
[Repeat of the Nelson Examiner November 25 article of effects of the earthquake in the Kaiparatahau district (lower Awatere Valley).]

[Report by Collinson, T. B., Park, R., & St. Hill, H. to the Colonial Secretary from the *Government Gazette*, Dec. 6 (see separate entry).]

NEW ZEALANDER AND SOUTHERN CROSS (Published in Auckland)
Source: New Zealander and Southern Cross, November 18, 1848)
Location: Wellington
Keywords: secondary, response/recovery

Of the expediency, if not absolute necessity, of his Excellency's presence [Earl Grey] in the South, there are few, if any, conflicting opinions. "The restoration of public confidence and *the whole future prosperity* of Wellington" do most unquestionably depend upon the promptitude, the energy, and the address exhibited in remedy of those disasters which have overwhelmed the town, and which - judging by his dispatches, prophetic of further evil, and cowed by those which have already occurred - have filled the mind of the Lieutenant-Governor [Eyre] with maudlin terror, and guided his pen with drivelling prognostications of desolation and gloom. Instead of animating the despondent, he has been the first to give added bitterness and unseemly exhibition of his own. If the Man quailed beneath the unwonted terrors of his position, the Governor was imperatively called upon to rally his energies, and to cheer and inspire the people confided to his rule, rather than prostrate and damage their settlement by expressions, ex cathedra, such as these, wafted on the four winds of heaven, and, which if calmly weighed over, are, after all, but the sorry evulgations of a nervous individual. "A blow has been struck (quoth the despatch writer) at the prosperity, almost at the very existence of the settlement, *from which it will not readily recover*".

Did Lisbon recover from her blow - compared with which, Wellington was but the filip of a ladies glove?

"Every one seems to feel a *presentiment* that it will end in some still more fearful catastrophe than any which has yet taken place. The terror which so frightful a visitation naturally produces in most men's minds, will *I apprehend* drive from the colony all who can find the means of getting away." We hope like Burchill in the *Vicar of Wakefield*, we may, without profanity, exclaim - "*Fudge*!"

When Terentius had withdrawn his shattered legions from one of the most sanguinary fields of the ancient world, such was his well grounded confidence in the energy and constancy of Rome, that in reply to *his* despatch, detailing his defeat, he received the thanks of the Senate, who pronounced him to have *deserved well of his country* because he had not *despaired* of the affairs of the republic. We would council Lieutenant-Governor Eyre to study Trentian maxim, recommending him to pause ere he again indulges in doubtful predications and injurious predictions.

There is *stuff* enough in Port Nicholson to defy despair; and energy sufficient to repair the calamity under which they labour. May their arms be strong - their hearts resolved.

WELLINGTON INDEPENDENT (Published in Wellington)
Source: Wellington Independent, October 18, 1848
Location: Wellington
Keywords: primary, secondary, mainshock, aftershocks, building damage, casualty, response/recovery, volcanic effects, atmospheric effects

It is our painful duty to record a serious and afflicting visitation. Since our last the whole district of Port Nicholson (and in all probability, the entire Colony if not the other Islands of the Pacific) so far as we have received intelligence from has been moved hither and thither, by a terrible, through grandly magnificent, agency of Nature. On Friday last, the day was remarkably fine, though rather close and sultry, but towards night the weather changed, and early on Saturday morning the wind came up from Southward and Eastward, blowing half a gale of wind, accompanied by heavy rain. No change was perceptible during Saturday and Sunday, but few anticipated the approach of so fearful a storm (if we may be so allowed to term it) of earthquake. About half-past one o'clock a.m. of Monday, a distant hollow sound was heard, the sound travelling at a most rapid rate, and almost instantaneously, in the course of a few seconds of time, the whole town was labouring from the most severe shock of an earthquake ever experienced by the white residents, or remembered by the Maories. The scene can never be effaced from our memory. The crashing of houses, the fall of bricks, the hurrying to and fro of women and children, and the incessant wave-like motion of the earth, producing a chill at the heart and dreadful feeling of sickness, was more than sufficient to appal the stoutest minded in the place.

The shocks continued at intervals, until half-past seven o'clock, a.m. When daylight broke the place presented a melancholy appearance. Most of the large brick stores and dwellings, together with many of the solid clay buildings, had received a severe shaking, and chimneys

were levelled to the roof in about two fifths of the houses in town. The Wesleyan Chapel, the Gaol, and other public buildings were seriously damaged, and the smash of Glass-ware, and other property, was very great.

Many men, women, and children had narrow and providential escapes, but up to this time we had to thank God for preserving life and limb.

During Monday, three or four slight quiverings were experienced, and owing to the threatening appearance of the weather, fears were entertained of a recurrence of more disastrous shocks. - The weather cleared off in the evening, and the stars made their appearance. But few slept during the night, and at four o'clock and at half-past seven o'clock in the morning two light shocks took place.

Yesterday [i.e. Tuesday 17th], business was at a standstill. Though the shops opened as usual, men felt anxious and concerned, and this was increased when the wind once more set in from the south-east. At half-past three o'clock a slight shock passed through the earth, within a second followed by one, if anything, more severe than that felt on the previous morning. Every house in the town worked and quivered like a ship in a gale of wind at sea, and several buildings wither fell in or were so shook as to endanger the inmates or those who passed beneath them. Shocking to relate, Barrack-serjeant Lovell, and two of his children, one a girl of about four years of age, and the second a boy of eight, were buried beneath the falling bricks and rubbish, which fell from the wall surrounding Mr. Fitzherbert's stores. They were immediately dug out, but we grieve to state that the little girl was quite dead, and the boy so injured that he expired at 11 o'clock last night. The unfortunate father received severe injuries, large pieces of flesh being torn from his thighs, but considering the awful nature of his affliction he is doing better than could have been expected.

But few brick or clay houses resisted the shock. The Colonial Hospital was severely injured, so much so, that it was though advisable to remove the patients to Government House. The patients were removed from the military hospital to the wooden barracks at Mount Cook, and the prisoners were removed from the Gaol and placed in the custody of the soldiery. On all sides, and in all directions, ruined stores and dwelling-houses present themselves to the eye - and the earthquake has clearly demonstrated that wooden buildings are about the only class of habitations which can be deemed secure against such dreadful shocks.

Tuesday night passed over, and daylight at length dawned on Wellington. Two or three shocks occurred, but not so severe ones. Many walked about and did not trust themselves in any place of shelter, whilst numbers formed tents and coverings in the open air.

The weather has now changed, and the wind appears to be setting in from the North. From appearances in the sky, it is imagined that the Tongariro or some other volcano is in active operation - if so we may deem the greater danger passed. Throughout the whole of the dreadful scene, we have to be thankful to the Supreme Being that so few of our fellow

creatures have been numbered with the dead; and whilst on this subject, we would notify, that the Scotch Church will be opened this Evening for the purpose of Divine Worship, and in order to offer up our gratitude for the preservation of the community from destruction.

Source: Wellington Independent, October 25, 1848
Location: Wellington, at sea, Taranaki, Wanganui, Porirua, Nelson, Marlborough
Keywords: primary, secondary, atmospheric effects, background, response/recovery, aftershocks, building damage, casualty

[October 25, 1848]
[Article in the *Wellington Independent* of Wednesday 18 edition is repeated]

Whichever theory we may take as the correct one in respect to the causes which originate earthquakes, it cannot be denied that the quantity of rain which fell during the winter, pouring into the bowels of the earth, and coming in contact with substances which are well known to generate heat and steam, or gas, has in great measure produced the convulsions which we have now to record. But when we consider that the natives themselves were surprised at the nature of the shock, and that not even the oldest of them remembers anything similar in force or duration, we are surely justified in considering the present as an extraordinary occurrence, an occurrence which in all probability may not occur again. Furthermore, we have sufficient evidence to prove that gas or steam has now forced a vent for itself, and a vent which, according to appearance, is not likely to be closed for a long period to come. Knowing this, knowing that in no single instance has a vertical or upheaving motion been experienced with any fatal effect in New Zealand, and knowing from the formation of the country that the effects (or dying efforts) of that power, which first raised the country from the deep and made it fit as an habitation for man, must be experienced in a manner similar to the subsidence of a storm, we consider that taking all these circumstances into consideration, we have no greater reason to dread abiding in New Zealand than we had on the first day that the settlers landed on these shores.

His Excellency Lieutenant-Governor Eyre in particular made himself conspicuous by his kindness and attention. He visited nearly all the shattered dwellings in town, cheered by the inmates, advised them to take refuge in the wooden houses, and otherwise endeavoured to console them under their serious affliction. The Ministers of the several denominations likewise performed good offices, and prayers have been offered up morning and evening in all the churches left standing, and in most of the private houses of the settlers. We have passed though a great trial - we have been made to feel the power of Him who rules the Universe - and whilst we cannot but all feel grateful to the Creator for his mercies in that He has preserved our lives, and the lives of those dearer to us, we fervently trust that New Zealand may never again be afflicted with a like calamity.

Wednesday, October 18. - The *Independent* was issued from the press about 12 o'clock a.m. In the afternoon the weather once more set in from the South-East and during the afternoon and evening slight shocks were felt.

Thursday, October 19. - During the night the wind blew fresh and the clouds betokened heavy weather from the southward. A few minutes after 5 a.m., a third severe shock was experienced, which lasted about a minute, completely destroying the buildings previously shaken. Messers W. B. Rhodes and Co's brick Bonded Store, the Wesleyan Church, and numerous dwellings of brick and clay were levelled with the ground, and many dwellings built of these materials apparently not previously injured, were now seriously damaged. Several families took refuge in the New Episcopal Church, and the wooden buildings were flewn [flown] to as places of safety by those who had been driven from their usual places of abode. A proclamation was issued by the Lieut. Governor ordering Friday Oct. 20 to be observed as a general fast by the inhabitants of Port Nicholson.

A company of soldiers and numerous civilians were employed during the day removing the property from Capt. Rhodes' bonded store, and it is with great pleasure we state that the Military conducted themselves exceedingly well, working cheerfully and together, and that nearly the whole of the buried property was removed and placed in safety.

Friday, Oct. 20. - The wind still continued from the same quarter, though the day was clearer than the preceding one. Prayer was offered up in the several churches, by the Ministers of the different denominations. Shocks were felt at intervals, but not severe ones. Mr. Lovel, after lingering to this time, expired in the morning, bowed down by the weight of his afflictions.

Saturday, Oct. 21. - Was a remarkably fine day, but slight shocks still continued.

The remains of Barrack Serjeant Lovel were consigned to the tomb, his two little ones having been buried the day previous. Deceased was buried with Military honours, the Band of the 65th preceding the corpse to the tomb, and a large number of civilians paid their last tribute of respect by attending the remains to the grave.

Sunday, Oct. 22. - Fine clear day, with wind from the north. Shocks took place at intervals of 3 or 4 hours.

Monday, Oct. 23. - Weather fine with wind from the same quarter. But few shocks were felt, and hopes were entertained that the subsidence of the Earthquake might be considered as certain.

Tuesday, Oct. 24. - Monday night passed over quietly, with only a few slight quivers felt.

The morning was fine and beautiful, and business was carried on as usual. - Men were employed taking down the shattered dwellings, and activity prevailed in every direction. So far inhabitants were inclined to believe that the shocks were at an end, but 10 minutes to 2 a

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slight tremble took place, and at 5 minutes past 2 a fourth severe shock passed through the earth, followed within a minute or two by a second and third, the three with the oscillation occupying seven and a-half minutes of time. - Up to this evening the shocks have continued with little interruption.

THE PUBLIC FAST

So awfully terrific was the shock on Thursday morning - so universal and great the destruction of property - so imminent and alarming the danger to life - so directly from the hand of God himself was the calamity, - and so utterly powerless was human aid to effect deliverance - that prayers and supplications to Heaven were the only means that could avail in this extremity. Accordingly the feeling that most extensively pervaded the community was that a day of fasting prayer, and humiliation, ought to be observed. The ministers were about to memorialize the Governor to appoint a day for this purpose, that so the whole community might engage simultaneously in these exercise, but so entirely did such a course approve itself to the moral sense of all classes, that while they were preparing for this application, they received intimation from his Excellency that such a step was resolved on, and were requested to make such arrangements as would best meet the wants and wishes of their respective congregations. On Thursday afternoon, a *Government Gazette* was published, containing the following Proclamation:

PROCLAMATION. - Whereas it has pleased Almighty God to visit this settlement with a great and grevious calamity, it is fitting that a public acknowlegement be made of the divine power, on whom all the operations of nature and the security of his creatures depend, and that prayers and supplications be offered up to Almighty God to avert the recurrences of any similar visitation:

Now therefore I, Edward John Eyre, Lieutenant-Governor of the Province of New Munster, by and with the advise of my Executive Council, do hereby proclaim and declare that tomorrow, the 20th of October, shall be held as a day of public fast, prayer, and humiliation.

(Signed) E. Eyre

Notices were also published in it by the Rev. Robert Cole, intimating that morning and evening services would be performed in the Episcopal Churches, on Te Aro and Thorndon Flats; by the Rev. P. O'Reily, that the Holy Sacrifice of the Mass would be offered up at half-past ten o'clock; and as the Wesleyan Primitive Methodist, and Independent chapels, were destroyed, the Ministers of the Evangelical Alliance announced three services to be held in the Scotch Church. The Ministers of the Evangelical Alliance held also services at the Hutt, Karori, Johnsonville, and on board the *Subraon*. The day was fine, and was observed throughout with the utmost solemnity. The audiences were unusually large, attentive, and devout; the devotions were solemn and earnest; and the addresses varied, appropriate, and

impressive. To prevent alarm, most of the services were in the open air. A public prayer meeting was held in the Scotch Church on the Wednesday previous, and it has been open almost every night since for the same purposes. Public prayers have been offered up frequently morning and evening in the Episcopal Churches. In the chapels at the Hutt, Karori, and Johnsonville, meetings for prayer and religious exercises, have been regularly held, almost every night. Sabbath last was a delightful day, and both in town and country the attendance upon public ownership was in every respect as marked, - the worshippers as numerous and devout as on the previous Friday, if not in some cases more so. We hope and trust that so many earnest prayers have not been presented to God in vain. A few smart shocks, and a great number of slight once, have been felt since; but none to cause alarm equal to any of the three great shakes, and our hope is that the danger is past. These various devotional exercises have had a most happy effect on the minds of many in allaying their anxious fears, and tranquilizing their agitated feelings. These have afforded them time and opportunity to reflect, and to think upon the mercy that has been mingled with the judgment. That, in a population of between 5 and 6000 Europeans - in the midst of such destruction of property - in the midst of so many perils and dangers - one family alone should suffer in their persons, and every other family should entirely escape, that three individuals alone should lose their life, and every other individual should be entirely safe, is perhaps unprecedented in the annals of earthquakes. The marked contrast between the destruction of property and the preservation of life has struck the whole community as a signal and merciful interposition of Divine Providence. - *Communicated.*

The two-topsail schooner *Sarah Ann*, arrived in port on Wednesday last, from Otago. She arrived off the heads on Friday week, and was signalised as a brig, but a gale, springing up from the N.E., she was driven back to the latitude of Otago. On the change of wind, the *Sarah Ann* was driven through the Straits, and when off Taranaki, on the morning of Monday week, she felt the first shock of the earthquake. The vessel shivered from stem to stern, and the impression of the captain and crew was that she had struck on a reef and was forging over it. The lead was thrown overboard, but no soundings were found. On Tuesday afternoon week, the *Sarah Ann*, then off Kapiti, experienced the second shock, with like results. During that night she observed a bright flame shoot up in a N.E. direction, the same occurrence having been observed in this place.

The barque *Clara*, Capt. Crow, arrived here on Wednesday last [October 18] from London, via. Auckland. When about sixty miles off shore the *Clara* experienced the shock of an earthquake, and whilst working in at the heads a second one, in which latter instance the sensation appeared to those on board as if the ship had struck on a rock.

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Capt. Collinson, R. E., arrived in town on Monday evening, overland, from Wanganui, which place he left on Saturday last. Up to that date, though all the shocks of earthquakes had been slightly felt there, no damage occurred, and the gallant officer states that the nearer he approached south, or towards Wellington, the more severe did the visitation appear to have been felt. Tongariro had not burst out, so that we must look to other quarters - in fact persons begin to think, that the convulsion came from the S. and E. The Barracks at Paramatta are severely shaken, and in all probability, must be pulled down.

The *Mary Ann* arrived in port on Monday from Nelson. The shocks had been severely felt at that place, and it is state [sic] I that most of the bric [sic] dwellings and chimneys were level with the ground.

By a boat from Queen Charlotte's Sound and Cloudy Bay, we learn that the earthquake had committed havoc in both those places; the clay houses and the brick chimneys being all more or less destroyed.

Source: Wellington Independent, October 28, 1848
Location: Wellington, Canterbury, Otago, Wairarapa, Lyttelton, Hawke's Bay, Poverty Bay
Keywords: secondary, building damage, background, response/recovery, mainshock, aftershocks, casualty

[October 28, 1848]
Since our last, several slight shocks of earthquake have been experienced, but the settlers are more sanguine that the convulsion is spent - that the generated steam or gas has forced a vent for itself. We may here remark, that the damage has been sustained by those possessing brick and clay dwellings. Wooden houses have in every instance escaped, and it is proved that (though we may not experience such another shock during the life-time of this generation,) this class of habitations are better adapted than any other for this colony. However, before this can be stated with confidence, it is advisable that a public meeting of the settlers should be convened, for the purpose of appointing a committee to report upon the late disastrous affliction, and to call upon the Executive to appoint an Inspector of Works, so that in future buildings may be erected after some well matured and systematic plan.

The schooner *Harlequin*, Price, master, arrived in port yesterday morning from Otago and Port Cooper. She left Dunedin on Wednesday week, and sailed from Port Cooper on Wednesday evening last. The Rev. M. Le Compt walked overland from Akaroa to Port Cooper, and has come passenger in the *Harlequin*. The first shock of earthquake was felt very severely at Akaroa, it having lasted from three to four minutes, but curious to relate, the same was scarcely felt at Port Cooper although but a short distance from it. It thus appears that the cause has originated on the S. W. coast of the Middle Island, and that it is travelling in a N.E.

direction towards the Curtis Islands, lying about 400 miles off the East coast. The second shock, which took place on Tuesday, the 17th instant, was not so severely felt at Akaroa. No appearance of volcanic irruption (sic) was perceived from on board the *Harlequin*, though the Aurora Australis or Southern Lights, and other phenomena which usually accompany shocks of earthquake, was observed with great brilliancy.

From Wairarapa we learn that the shocks of earthquake had been felt rather severely in the valley, though no damage had been sustained excepting the upsetting of milk and cream pans. The natives were dreadfully alarmed, forsook their pah, and took to the bush. They all assert that none of them remember such severe shocks.

By the *Queen* and *Gipsey*, from the East Coast, we learn that the shocks of earthquake had not been felt there.

We have been requested to state that subscriptions towards the relief of the widow and children of the late Barrack-sergeant Lovel, will be received by J. O. Hamley, Esq., Barrack-master.

Died. - At her residence, Lambton-quay, on Thursday last, Mrs. Janet Nicol, aged 43 years. - An Inquest was held the following day at Barrett's Hotel, on view of the body, before J. Fitzgerald, Esq., M. D., Coroner. - Mr. Nicol being called in stated, on Thursday the 19th instant, I found my wife lying on the floor (about 3 o'clock) apparently in a fit, but unfortunately she was dead; she had not five minutes before served the coxswain of the *Fly's* gig, with a bottle of grog; when I went into the room she was lying on the floor amongst broken dishes and water, which must have been capsized at the time she had fallen by the severe shock of an earthquake; the large cask in which we kept our water having been upset. The Jury after a short consultation returned a verdict, "died of apoplexy".

Source: Wellington Independent, November 1, 1848
Location: Wellington, Marlborough, Wairau Valley, Awatere Valley, Manawatu
Keywords: primary, secondary, aftershocks, ground damage, faulting, background

[November 1, 1848]
Since Saturday, a few slight shocks of earthquake have been experienced, and reports have been heard at intervals, accompanied by a rumbling noise, similar to the concussion produced from the firing of heavy guns. From this we imagine that volcanic action is in operation, and to corroborate this impression we give the following statement made by the natives at Porirua, to one of our correspondents at that place. - "The native chief Kanae, has just arrived in a boat from Wairau. He states that they experienced a heavy shock of an earthquake on Sunday the

29th inst., Rauparaha was thrown out of his bed and had his hip sprained; and he reports that the earth had opened, and that the hills have been thrown down, and that the water is bubbling up through the cracks. He seems to think that Wairau is done for". Whilst not placing implicit confidence in maori "yarns", there is every probability that the earthquake has opened a vent in the neighbourhood of Cloudy Bay.

MANAWATU. - In this district we learn that the earthquakes were felt at the same time that violent shocks were felt here, but greatly less violent; some chimneys were rent others were not injured. The first shock, on Monday the 16th, appears to have been the most violent in the Manawatu.

The natives say that about ten years ago there was a much heavier shock than any that has been felt at this time. It occurred during the day, and so violent was the commotion, that many were thrown down on the ground. It thus appears that earthquakes in this country are local and partial. During the violent shock on the morning of Thursday, the 19th, some people being out of doors on Te Aro, were either thrown to the ground or had great difficulty in keeping their feet.

Source: Wellington Independent, November 4 and 8, 1848
Location: Wellington, Marlborough, Taranaki, Wanganui, New Plymouth, Awatere Valley, Wairau Valley
Keywords: primary, secondary, aftershocks, volcanic effects, ground damage, faulting

[November 4, 1848]
[Article reprinted from the *Nelson Examiner* of October 21concerning the earthquake].

[November 8, 1848]
Since Wednesday last, slight shocks of earthquake have occurred at intervals, and numerous reports, like the sound produced from the firing of a park of artillery in the distance, have been heard day and night. The majority of natives assert that Volcanic action is in force at the Bluff [White Bluffs], two miles south of Wairau, on the Middle Island, and they likewise say that the hill which has now opened, tho' a cone, had not the slightest trace of its ever having been a vent, up through which the gases, collected in the earth, might escape. We trust in a few days to know the truth or falsity of these reports.

Rev. W. Woon, writing from Waimate, midway between Wanganui and New Plymouth, says that the shocks of earthquake there were fearfully felt. His house rocked and reeled under them like a ship at sea, in a gale of wind, and the bells of the chapels rang as though struck for service. His wonder is that the frail houses built of reeds and rushes, did not come down upon them. The shock of Monday the 16th occurred at near 2 a.m. and that of Thursday between 6 and 7 a.m. He received a letter from one of his correspondents at Wanganui, stating that the

earthquake of Monday was very violent! The Block houses and strong fences shook and rocked like reeds, in a gale of wind, and a sulphuric smell nearly suffocated them, while the steel that was exposed was covered with a thick black scum.

[Reprint of article in the Nelson Examiner of October 28, 1848 about the effects of the earthquake in Nelson].

Source: Wellington Independent, November 22, 25 and 29, 1848
Location: Auckland, Taranaki, New Plymouth, Nelson, Marlborough, Wellington
Keywords: primary, secondary, mainshock, aftershocks, tsunami/seiche, building damage, response/recovery

[November 22, 1848]
Private letters received from Auckland, per overland mail, we have received intelligence to the 23rd October. Shocks of Earthquake had not been experienced there, but we regret to state that the inhabitants were more or less afflicted with fever.

TARANAKI (*From our own Correspondent*)
New Plymouth, Nov. 6, 1848
This settlement has fortunately escaped uninjured during your late disasters, it seems, however, that we felt several of those vibrations which were most violent at Port Nicholson; on the morning of the 16th, and 19th, at about 2 and 5 o'clock, shocks were experienced, but not much more severe than common, on the afternoon of the 17th, a slight tremor was observed by some, these of course did no damage, and would not have been noticed more than usual, but for the interest with which the late occurrences in the south have invested all such phenomena.

On Sunday the day preceding our first shock we had a gale of wind from the S.E. but with fine weather, as is usual with the wind in that quarter. On Wednesday we had one of the heaviest gales of wind ever experienced here from the N.,W., accompanied by much rain and a remarkably high tide; last night Nov. 5, we had much lightning and thunder with heavy rain, and a close atmosphere.

[November 25, 1848]
[Reprint of article in the *Nelson Examiner* of 11 November about the effects of the earthquake in Nelson].

If the above [article] be correct we congratulate the colonists of Nelson on their trifling loss. Our contemporary states "it therefore seems that Wellington was the centre of the shocks, and that they radiated from thence until their force was expended". This is incorrect. The shocks appeared to come from the South West, and at Wairau, Queen Charlotte Sound, and other

places on the Middle Island were felt more severely than in this neighbourhood. Our impression still is that they originated at the Cascades [Fiordland], on the South West coast of the Middle Island, for that part of the country has on several occasions been the scene of similar phenomena.

Our friends at Nelson, have been singularly active in spreading reports as the extent of damage sustained at Wellington. The immigrants per *Bernicia*, were informed that all the houses in the place were shook to pieces, and that the settlers were flying away in terror from the town. Wellington has certainly suffered from this visitation, and though £30 will not repair our damages, the passengers by the *Bernicia* can testify to the falsity of the statements made to them at Nelson. We would suggest to our friends the propriety in future of confining themselves to the truth, for when we hear that such remarks have been made of Wellington, we may reasonably question the truth of the statement that £30 will cover the losses sustained in Nelson. Certainly the passengers in the *Bernicia* estimate the Nelson settlers but lightly for the very questionable accounts received there of the effects of the late calamity here.

[November 29, 1848]

Our contemporary, the *New Zealander*, is exceedingly indignant at us for imagining that the entire colony had suffered from the earthquake. We feel thankful that the North escaped, but the Editor should remember that earthquakes have been felt, before to-day, over fourteen degrees of latitude and longitude. And the first impression of many of the settlers was that the entire colony had experienced with more or less severity, the shock felt here. Our contemporary has drawn deductions from our remarks totally at variance with the wording of the article. He has ascribed to us, what his own feelings would have been, had the late catastrophe occurred in Auckland, and in so doing has exhibited a very weak and pitiable state of mind.

To the Editor of the Wellington Independent

Sir. - I observe in the Auckland papers the despatches of the Lieut. Governor to Sir Geo. Grey, detailing particularly the recent earthquakes, and written apparently under the influence of the wildest fear, and in a tone so desponding that it is by no means surprising to find our friends in Auckland taking measures as if the town of Wellington had really been "in ruins". Serious has been the extent of damage done, and great as was the alarm excited during the period of the heavier shocks, a very great proportion of the buildings in the town, being built of wood, have escaped with little other injury than the partial destruction of their chimneys. Of the brick buildings destroyed there were very few which did not promise at some time or other to expose the then inhabitants to the risk of destruction from the decay and disintegration of the wretched composition used instead of mortar in their construction. That the loss has been universal, and in some instances heavy, is the fact, but it has in general been portioned to the means of the sufferers, and there are few who will not be able to weather the

difficulties to which it may have given rise, especially if temporary assistance to a comparatively small amount be afforded.

The account given of our disasters, has called forth a manifestation of feeling on the part of our fellow settlers in Auckland, which is as gratifying as (to our shame shall I say) I must say it was unexpected. I am but anticipating the more formal expression of them, when I tender to the settlers of Auckland the hearty thanks of this community for the promptitude and warm-hearted liberality which they have displayed in raising contributions for the relief of this town.

There is a way, and I think only one, in which advantage may be properly taken of this liberality. The gentlemen whose names are found mentioned as having charge of the distribution, might lend the money received in sums varying from £10 to £20 upon the promissory notes of the borrowers, payable on demand, without interest, it being understood that the money would not be required for two years, or such further period, as might be arranged. In this way persons of limited means, but in good employment, might be assisted in the reconstruction or repairing of their houses, and the money when ultimately returned to Auckland, might be used in erecting some public building commemorative of the occasion and of the benevolent spirit which led to the collection of the fund.

I remain, Sir, Yours etc.
P.
November 27, 1848

PUBLIC MEETING

On Thursday evening one of the most numerous and respectable Public Meetings we ever recollect to have witnessed in Auckland, was held in the Hall of the Mechanic's [sic] Institute, for the purpose of expressing sympathy with and rendering aid to the suffering community at Wellington. Theophilius Heale, Esq., occupied the chair. His Lordship the Bishop, the Rev. Mr. Lawry, and other Wesleyan ministers were present. The utmost unanimity appeared to actuate the Meeting. All were earnest in their expressions of good will, the only difference of opinion was on some matters of detail. The following resolutions were unanimously adopted, and before the meeting separated, upwards of £266 was subscribed. Lists were to lie at the Union Bank, and the stores of Messrs. Gibson and Mitchell, Mr. D. Nathan, and Mr. T. Forsaith; parties wishing to subscribe, not otherwise applied to, were requested at call at either of those places. We have also been informed that collections in aid of this fund, will be made after the services to-morrow at the Wesleyan Chapel.

RESOLUTIONS

1. That this meeting has heard with feelings of the most painful kind, of the calamitous results of the earthquake which has been experienced in the districts adjacent to Cook's Straits, more

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particularly in the settlement of Wellington, where several lives have been lost, and a large amount of property has been destroyed; and as our fellow Colonists in all parts of New Zealand, are regarded as brethren, bound together, in many respects by a unity of interest, though occupying separate localities, rendering the welfare and prosperity of each community matters of great concern; this meeting does most deeply sympathize with the inhabitants of Wellington, and Cook's Straits, under their present great affliction.

2. That in order to give consistency to the feeling of sympathy so universally prevalent in this settlement, this meeting doth adopt the following Address; and doth request and empower the Chairman to sign and forward the same with the least possible delay:-

Source: Wellington Independent, December 2, 1848
Location: Wellington
Keywords: primary, secondary, response/recovery

[December 2, 1848]
On Thursday evening, a Public Meeting took place in the Britannia Saloon, convened for the purpose of receiving the kind address of sympathy from the inhabitants of Auckland, and to consider what steps should be taken with the money subscribed there for the relief of cases of extreme distress, if such exist, occasioned by the late visitation. The meeting was called for half-past seven o'clock, and by that time the Theatre, including boxes and stage, was filled to overflow. It was perhaps the most numerous and respectable assemblage yet held in Port Nicholson. And here we cannot avoid alluding to the perfect unanimity which prevailed. All classes - all sects - were present to testify their gratitude to the Northern settlers for the liberal donation. The Episcopalian, Roman Catholic, Presbyterian, Wesleyan, Independent, and Primitive Methodist Ministers, occupied the platform, in company with a numerous body of officials, merchants, storekeepers, &c.

On the motion of W. Hickson, Esq., J. P., the Rev. R. Cole, M.A., was called to the chair with acclamation.

The chairman stated that he felt great pleasure in being present, on this occasion, for the object of the meeting was to follow out the glorious principles of Christianity - good will to all men. He then read the account of the public meeting held at Auckland, at which the address of sympathy was adopted, and stated that the Committee appointed by the subscribers to manage the appropriation of the fund, had received two several amounts, viz., - £400 subscribed by the inhabitants of Auckland, and a contribution of £100 from the Bishop,- making a total of £500. After expressing in warm terms the admiration which he felt at the generous sympathy displayed by the northern settlers, the worthy chairman called upon Mr. Hort to move the first resolution.

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A. Hort, Esq., J.P., after passing a well merited eulogium on the character of the Rev. R. Cole, said that the inhabitants of Wellington had great cause for thankfulness. In the midst of all their afflictions, at the time of the greatest danger, they had to be thankful to the Supreme Being that so few lives had been sacrificed. And he felt great pleasure in being present at a meeting like this, in which, sinking all political sentiments, they could express themselves in the warmest possible manner, to the settlers at Auckland, for their very generous and truly noble conduct. After a few more remarks, Mr. Hort read the following resolution :-

1st. That the Address of the Inhabitants of Auckland to their fellow-colonists in this settlement, has excited in our minds, feelings of the highest esteem, and the most unfeigned gratitude.
Rev. S. Ironside stated that he fully concurred in all that had fallen from the very worthy chairman and the last speaker on the conduct of the inhabitants of Auckland, and he thought he should best evince the same by seconding the resolution.

The resolution was then put from the chair, and carried unanimously.

Rev. J. P. O'Reily said, he had been requested to read the next resolution to the Meeting. He considered that the Inhabitants of Auckland had exhibited so generous, so kind, and Christian a spirit towards the sufferers at Wellington, by the late dispensation of Providence, that he could scarcely find language to express his feelings on the subject. The Great and Good Being in the midst of their afflictions, had raised them up friends, and throughout the visitation they had reason to be thankful for the mercies of the Almighty.

2nd. We, the Inhabitants of Wellington and its vicinity, in public meeting assembled, return you our most grateful and cordial thanks for the sympathy and benevolence you have displayed towards us under the recent severe dispensation of Providence with which this settlement has been visited. While we acknowledge that this calamity has been, in some instances, attended with great destruction of property, we have abundant reason to be thankful "to the great Being by whose inscrutable Providence this visitation has been permitted and controlled," for his many mercies, particularly that so few lives have been lost, and that the injury sustained by the settlement, is ascertained to be so much less than was anticipated. It is also a great consolation to us, in this trial, to receive from our fellow-colonists at Auckland, such ready sympathy, so noble and munificent a proof of their regard; and we trust that the spirit of Christian charity, of which you have given so memorable an example, may ever influence the colonists of New Zealand, and join in the very bond of peace the different settlements into one prosperous and united colony.

The Rev. J. Inglis seconded the adoption of the address. – He spoke in the highest terms of the deep sympathy so feelingly displayed, and the liberal assistance so promptly rendered by our fellow colonists in Auckland; and said that while the intelligence received there had evidently

produced a false impression on their minds as to our actual circumstances, they had acted up to the full extent of these impressions in expressing their sympathy and extending their aid. It was matter of thankfulness that our neighbours had not suffered, ready as they are to render us any assistance we might require; and while we cannot be too thankful to a merciful Providence that our circumstances are not in any measure so bad as was supposed at Auckland – while there is little if any real distress in the community – while in all other respects our circumstances are highly favourable, the public health was never better, sickness of any kind being at present unknown, - employment is plentiful and wages good – provisions are abundant and cheap, and every thing connected with the season and the settlement encouraging – whilst all this was the case, he was sure the general feeling was that the conduct of our fellow-colonists in Auckland ought to be highly appreciated, and their kindness as gratefully acknowledged, as if we had been in the very same distress in which they supposed us really to be, or feared we should be in, before their aid could arrive. He cordially seconded the address.

The Address was carried without a dissenting voice.

Mr. Woodward said he had been instructed by the Committee to state to the meeting what the Committee had done, and the purpose for which they had come before their fellow settlers. They regarded themselves as trustees for their generous Auckland friends, and therefore did not pledge themselves to any course of proceeding, although they were anxious to hear the opinion of the meeting. They had not sent the money, and were prepared not to do so, if it should appear that there were such cases of distress as would justify its application. They did not know of such. They had held two meetings at which each member had been invited to state any cases that had come under his observation, and these had been found to be so few, that the Committee were of opinion the money should be returned. That many persons had been much inconvenienced, that many houses contained more than their ordinary tenants, they were quite aware; but while they deeply sympathized with distress in every form, they still thought all such cases might be fairly met by efforts on the spot. The committee, however, made no proposition on the subject, but left it entirely to the meeting, to make such suggestions they might think fit to offer.

Mr. Roots objected to return the money, and proposed the retaining of it for a short period. No one seconded the motion.

Dr. Featherston stated, that he had not intended to take part in the proceedings, but he could not permit such a resolution to be mooted without saying a few words in reply. He (Dr. F.) acknowledged in the strongest manner the obligation under which the inhabitants laboured to the Auckland residents, for the people at the North had come forward and exhibited the kindliest feelings towards this place. But it appeared to him that the money had been subscribed under a false impression. The Auckland settlers were told in a certain despatch that "Wellington was in ruins," and that the inhabitants were labouring under severe distress. Our

fellow-colonists had contributed a considerable – nay a very considerable amount to alleviate the destitution which they were led to believe existed in this place. That despatch further went on to state that "a blow has been struck at the very existence of the settlement from which it will not readily recover." Why gentlemen since the formation of the colony, has not this settlement struggled through and overcome more serious calamities than the late affliction – serious though that affliction has been. And was it proper for a man holding so high a position as the writer of the despatch in question, to speculate on possible contingencies, and to predict the ruin of the settlement. That despatch had been published at Auckland, and created an impression in the minds of the Northern settlers that the inhabitants of Wellington were suffering extreme distress and misery. Under these circumstances he believed it would be unjust to retain monies so subscribed, and he should therefore propose :-
3rd. That this meeting being of the opinion that the effects of the late calamity are not of such character as our fellow-colonists in Auckland have been led to believe, and being also of opinion that they will best show their heart-felt appreciation of the prompt and munificent manner in which aid had been afforded, by refusing to take an improper advantage of the kindness this manifested, therefore advise the Committee to return the money subscribed, coupled with the expressions of their warmest thanks.

Mr. Stokes seconded the resolution.

Mr. Carpenter objected to the resolution, and after saying a few words as to the impropriety of doing anything which, by any probability, could be construed into insult, proposed the following amendment:-

That this meeting instruct the Committee to accept the funds so kindly subscribed by our fellow-colonists at Auckland.

Mr. Roots seconded the amendment.

The amendment and resolution were then put from the chair, when the latter was carried almost unanimously.

Dr. Featherston proposed the next resolution. He allowed that some few cases of distress might exist, but he believed if any one in the community had suffered to any extent, that such distress would have been made known. However, there was already a fund of about £80 – a balance of a former subscription not appropriated, which might be employed in alleviating the distress of anyone who could establish a case, and, though he had no idea that distress, really speaking, existed, still he would propose:-

4th. That the same Committee be requested to receive applications from parties who have suffered by the earthquake; and if they find that the case required it, that they set on foot a public subscription in Wellington for the relief of such sufferers, and that the Committee have power to add to their number.

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W. Fox, Esq., Principal Agent of the New Zealand Company, seconded the resolution. The conduct of the Auckland settlers had been noble and manly: they have manifested the warmest feelings of humanity: but he (Mr. F.) considered that if the money had been retained, a great act of injustice would have been committed. The inhabitants of Auckland had been led to believe that the condition of this place was far worse than what it really is, for as to the settlement not recovering, he would ask, has it not partially recovered already? And as to its ultimate recovery, he, along with those he observed around him, entertained not the shadow of a doubt. If distress existed in the place, the colonists were bound to alleviate it from their own means, and he therefore felt extreme pleasure in seconding the motion.

Rev. S. Ironside said, that though he did not desire to appropriate the fund, he would rather retain it for a short period, and should distress be found to exist, alleviate it out of the money so generously placed at their disposal.

Mr. Woodward having expressed the views of the Committee, wished also to have the opportunity of stating his own. After the speech of Mr. Fox, he thought that the retention of the money could not be justified even on the ground of expediency. All knew that there was something like eighty pounds, which could be made available, and this, with such private aid, as he felt confident would be afforded would meet all the cases in which relief might be desirable. He would earnestly protest against using money which had evidently been contributed under an erroneous impression. What would be said if it was found that we allowed, "distress and suffering" to exist for six weeks, and only thought of relieving it, when we had other people's money to do it with. It had been proposed to make application to the British Government, and it evidently would damage any claims which must necessarily be for a large sum, by accepting these donations, which could not reach the heavier sufferers, and were not required for the lesser. He therefore most cordially supported the resolution that the Committee be advised to return the money forthwith.

The resolution was then put from the chair and carried unanimously.

A vote of thanks was then passed to the worthy chairman, for his upright and courteous conduct in the chair, and the Meeting separated.

Source: Wellington Independent, December 6 and 9, 1848
Location: at sea, Wellington, Otago
Keywords: secondary, aftershocks, background

[December 6, 1848]
The *Fly*, when off Stephens Island, on Thursday, about 5 o'clock p,m,, experienced a severe shock of an earthquake, and during the night several lesser shocks. The shocks were not felt here [Wellington].

[December 9, 1848]

We have already mentioned that the late shocks of earthquake which have been felt in this settlement, had not extended to Otago. We have since heard that very little of them has been felt any where South of Bank's Peninsula, and that if any faith may be reposed in the Native reports, they are altogether unknown in the Otago country. A gentleman thoroughly acquainted with the native language, was unable to make the Natives at Otago understand what he meant, in attempting to describe an earthquake to them. This could hardly have been the case had they ever occurred here.

[Repeat of the *Nelson Examiner* article of November 25 concerning effects of the earthquake in the Kaiparatihau district (lower Awatere Valley).]

WESTMINSTER REVIEW (Published in England)

Source: Westminster and Foreign Quarterly Review, April-July, 1849, Vol. 51 – 1849

Location: Wellington, Wanganui, Nelson, Otago, Marlborough, Wairau Valley, New Plymouth, Canterbury, Christchurch, Hawke's Bay

Keywords: primary, secondary, mainshock, aftershocks, building damage, volcanic effects, atmospheric effects, uplift/subsidence, casualty, ground damage, response/recovery

[Note: copy in Alexander Turnbull Library, NLNZ seems to have originally the property of H. S. Chapman. It has hand-written annotations, which are included here in {}.]

p. 395 [Following on from material quoting Humboldt's Cosmos]

Passing over the numerous examples of similar phenomena which have been recorded, we will now lay before our readers a journal of the events attending the late earthquakes in New Zealand, from the pen of H. S. C., an old contributor to the 'Westminster Review', now holding a high judicial appointment in this rising colony [Mr. Justice H. C. Chapman of Karori, Wellington]. The journal was kept at Karori, a short distance from Wellington; and will be found exceedingly interesting, since it records the occurrence of all the phenomena of sound and motion stated by Humboldt to accompany earthquakes in other parts of the world. New Zealand, it will be recollected, bears throughout the whole extent of the colony, abundant evidence of the prevalence of intense volcanic action at some previous period of its history; and the mountain Tongariro, mentioned in the following journal, may be regarded as the centre of the modern volcanic action in the northern island.

Monday, October 16th 1848

At twenty minutes before two this morning we were awakened by the shock of an earthquake, of greater force and duration than any we have hitherto felt in the colony. It was, moreover, the first of a series of shocks, which succeeded each other at short intervals during the morning and day. The house (fortunately of wood) rocked violently: the bells were set in motion and clocks stopped. For about three-quarters of a minute the shock were {was} so strong that it was with difficulty I kept my legs. It continued with some force for two or three minutes, and the whole vibration lasted ten minutes. For one hour the shocks scarcely ceased

for a minute; during the whole morning, until between six and seven o'clock, the intervals were not long, and the tremulous motion of the earth was continuous, and nearly incessant. We feared for our chimneys, but they did not fall. They were however, so much injured, that, to prevent accidents I had them taken down. The] wind was S.E. to N.W. during the night, blowing a fierce gale, with very heavy rain. I went down stairs to look at the barometer after the first shock; at nine on the previous night the mercury stood at 29 inches (our house is 500 feet above the harbour), it had risen to 29.04. In the morning it had subsided to 29.02 – a very insignificant variation.

We learn that many chimneys are thrown down in town, and more cracked. The chimneys in our former house (Mr. Tysus') are all down. Brick buildings in the town are slightly injured.

Most of the shocks come from about N. by E., or N.N.E., one or two seemed more easterly – say N.E.; and one seemed to have a double source, meeting about this neighbourhood. The twisted appearance of some of the chimneys confirms this;

Tuesday, 17th. – The shocks continued all day, at varying intervals. At twenty minutes before four a shock took place of greater force than the first. I was at Government House; the house shook, **jerked,** and then vibrated so as to shake all loose articles to the ground. I found it necessary to steady myself on my legs. There was first a shock of about four or five seconds' duration, and of moderate force; then came a loud sound from the northward and eastward, and then the strong shock. The French windows burst their fastenings and flew outwards. The chimney-piece was cleared of its ornaments – the bottles flew from the table. Its extreme force continued about a minute – perhaps rather less. Parnale, our carpenter, who was securing one of our chimneys at Karori, afterwards told me that the tremulous motion of the earth did not cease for eighteen minutes. Loud exclamations along the whole line of the beach indicated the wreck that was going on, and the general alarm that this severe shock occasioned. I had business at my chambers at four. On reaching the Court House, I found the short stout chimney had literally fallen down of {~~of~~} itself: it could not fall outward, being supported on one side by my room, and on the other by that of the Registrar. I next visited the Colonial Hospital – a well built brick building, only lately finished: it was not down, because the walls and roof were held up by strong bond timbers; but the brickwork was split and rent, and starred in all directions, so as to make it untenable. The whole must come down. Mr. Eyre, with as much kindness as promptitude, caused the patients to be removed to the new rooms at Government House. Looking towards Te Aro with a glass, it was seen that most of the brick building were more or less injured. Chimneys lay prostrate in all directions. They are generally built outside, and against the gables of the houses, so that happily no harm was suffered by the inhabitants of the wooden houses.

I returned home at six. I found the lower parts of our chimneys further damaged: the library chimney cannot be used; the parlour chimney, which goes through the centre of the house, has been secured with boards and lashings, so has the kitchen chimney. A small chimney in the

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wing of the house, used as a day-nursery, appears to be uninjured, except the top, which we have taken down to avoid danger outside.

Wednesday, 18th. The shocks have continued all night and all day, but none of the strength sufficient to do injury to undamaged buildings. The earth is in a constant state of tremulousness, and the dull sound of the earthquake is continually heard. This sound has been much exaggerated. It is something like the sound of a railway train rumbling through a tunnel – I mean as heard by a person outside and rear the mouth. I have also heard nearly a similar sound made by a very large steam-ship chimney – except that the earthquake sound is less sonorous. It has been compared with distant thunder and with distant guns, but it is more rumbling in its nature: in short, it admits of no exact comparison. I have noted that when the shocks occur during a heavy gale, as on Monday, this dull rumbling sound is not perceptible: it is overcome by the greater noise of the wind. When the shocks occur in calm, they are generally preceded and sometimes followed by a strong puff of wind.

I visited Te Aro this day. (Te Aro is the business part of the town, forming the head of Lambton Harbour.) It seems to have been the seat of the greatest force of the earthquake. All the large merchants' stores, the ordnance store (late Waitt and Tysus), the Methodists' Channel, and a great number of brick dwellings, are rent in pieces. The walls just hold up the roofs, but large masses of brick-work have fallen out: all must be taken down. The gables of Mr. Fitzherbert's store and of the ordnance store fell across Farish-street, and unfortunately buried Barrack-master Lovell and his two children. The little girl, eight years of age, was dead when taken out; the boy, four years of age, died at night; and the father was taken to the Military Hospital much injured. (He died on Friday; the Government loses in him a very faithful servant, and he was much respected by everybody).

(All Tuesday a large volume of smoke was seen hanging over the Hutt. It collected afterwards into a dense smoke-cloud. It looked like a bush fire, but after so much rain no bush would burn. I should hardly have noticed this, had it not been that or Tuesday night the sky to the northward was said to be illuminated apparently by some distant fire; and it is suggested that Tongariro, about 140 miles north of Wellington, may have burst out.) {This was afterwards found not to be the case.}

Thursday, 19th. – Precisely at five this morning we had a sharp shock, stronger than either of the two already noted. The extreme force of the shock lasted rather less than a minute, there was considerable motion for 3½ minutes, and the vibration lasted 8 minutes from the commencement of the shock. It has done us more damage than all the others together. It has split the solid bed of brickwork which forms the lower part of our oven, completed the destruction of other chimneys, torn the plaster of our lower rooms to pieces (the upper are lined with wood), and broken a great many loose articles. Our windows (French casements) flew open. After this shock followed shock in quick succession all day and night.

In the evening, until about half-past nine, the sky to the south and south-west presented a remarkably lurid appearance; but I do not thinks it needs an eruption of a volcano to account for it. In very angry skies, during gales of wind at sea, I have seen something of the kind. If the state of the atmosphere be such as to increase refraction, the sun's light may have some effect long after sunset (say 2 1/2 or 3 hours in this case), and falling on very dense clouds would produce a very angry appearance.

Friday, 20th., - The shocks have continued in quick succession all night. They have, I think, rather diminished both in force and frequency during the day.

The Te Aro end of the town is a wreck. Rhodes's large brick store is down to the ground. The front of the Methodists' Chapel is out. Ridgway's, the Ordnance, Fitzherbert's, all extensive brick buildings, are complete ruins; even the low wall round Fitzherberts' yard is down. There is considerable loss of property within. In one respect, the last shock has done good; it has thrown down many walls that were in a very dangerous condition. There is naturally a good deal of alarm in the town, owing to the continuance of the disturbance. Some people are encamping on the hills, under the impression that they are safer: I do not find anything in the result of the shocks to justify this. All wooden buildings have hitherto been safe; and much of the damage to the brick buildings is owing to the miserable manner in which they are built. Both lime and bond timber have been far too scantily used.

(I learn that on Wednesday there was an unusually high tide. Although the tides are at the neap, the tide rose over the beach-road, and flooded the lower parts of some houses. The continuance of S. E. gales would, in the absence of earthquakes, be enough to account for this, yet it seems to have produced a good deal of alarm.)

Saturday, 21st., - Weather fine, barometer rising, shocks frequent. It is noted that they come more frequently at or about low water. They are not of a dangerous character, and are, I think, weakening.

"Sunday, 22nd., - Weather most beautiful; still the shocks continue about every hour. They only last two or three seconds, and are sometimes only heard, not felt. At four o'clock, rather a sharp shock (it is about low water). People less agitated to-day – the splendid weather raises people's spirits.

There are some earth cracks on the beach near high water mark, and some Pipi shells (or cockles) have been thrown up.

Monday, 23rd - Day also fine, with fresh N. W. breeze. Shocks rather frequent, say about every half-hour, but not strong.

State of weather previous to and during the Shocks.

During the latter part of September, and up to the 6th Of October, the weather had been

remarkably fine and dry. The barometer ranged, during the first week of the month, from 29.42 to 29.80, with a NW wind (with which wind it is generally lower), and at about 500 feet above the harbour. In the night of the 6th, the barometer began to fall lower (it had been slowly falling from the 1st), and rain came on. The following is a table of the weather from the 7th, to the 15th:-

	Thermometer		Barometer		Winds	Weather	Observations
	9 am	2pm	9am	9pm			
Saturday 7th	50	54	29.15	29.06	NW gale	Rainy	N.B. Barometer at least 500, or perhaps nearer 600, feet above the sea
Sunday 8th	50	52	29.11	29.12	SE gale; fresh at night	Showery	
Monday 9th	42	42	29.17	29.24	SE gale	Rainy	Very cold; an immense quantity of rain fell
Tuesday 10th	46	52	29.24	29.24	SE gale	Rainy	
Wednesday 11th	48	52	29.25	29.25	SE moderate	Showery	
Thursday 12th	48	56	29.20	29.17	NW moderate	Fine	
Friday 13th	52	62	29.11	28.97	NW fresh	Fine	
Saturd. 14th	48	48	28.97	29.00	SE Fresh. pm gale	Rainy	Ten inches of rain said to have fallen in the week
Sunday 15th	42	48	29.02	29.00	SE gale	Rainy	

Table of the Thermometer, Barometer, etc., since the first shock.

	Thermometer		Barometer		Winds	Weather	Observations
	9 am	2 pm	9 am.	9 pm			
Monday 16th	45	48	29.02	28.95	S.E. to N.W. moderate	Showery	Strong shock 20 minutes before 2 am
Tuesday 17th	52	56	28.87	26.86	S.E.gale	Fine	17. Stronger shock 20 minutes to 4 pm
Wednes. 18th	48	50	28.48	28.37	S.E.gale	Showery	
Thurs. 19th	48	48	28.80	29.10	S.E.gale	Cloudy	19. Stronger shock than the last:5 o'clock a.m.
Friday 20th	48	50	29.24	29.32	S.E.strong breeze	Fine	
Saturd. 21st	50	54	29.50	29.50	S.E.moderate	Fine	Shocks continuing at short intervals
Sunday 22nd	54	62	29.56	29.56	N.W.,light, freshened p.m.	Very fine	
Monday 23rd	59	64	29.58	29.58	N.W.fresh	Ditto	Strong shock of short duration at 2 p.m.
Tuesday 24th	60	64	29.58	29.44	N.W.mod.	Ditto	Shocks continue
Wed. 25th	60	66	29.27	29.35	N.W.mod.	Ditto	
Thurs. 26th	60	56	29.27	29.35	N.W.mod., S.E.pm.	Ditto	Shocks decreasing only 5 to 7 in 24 hrs.
Friday 27th	51	52	29.42	29.42	S.E.fresh	Showery	
Satur. 28th	54	62	29.4	29.35	S.E.light; east p.m.	Fine	29th.Ther 71° at noon, but fell with wind.
Sunday 29th	62	64	29.30	29.30	S.E.fresh	Very fine	
Monday 30th	56	66	29.27	29.20	N.W.strong	Very fine	
Tuesday 31st	50	54	29.10	28.95	N.W.gale	Rainy	Shocks weaker

A very few of the shocks appear to have come from the opposite direction, i.e., S.E. and S.S.E. These may be a sort of subsidence from the southward, after some appearing from the northward? It ought to be noted, however, that even a close observer may be deceived as to the direction of a shock. As to the displacing of furniture, no inference can be drawn. In my

bedroom, a double chest of drawers, against a N. E. wall was slid four or five inches forward. At the Bank a piano against the S. E. wall was projected four or five feet into the room, while another piece of furniture on the opposite side was forcibly thrown down. The sounds are certainly from the N. N. E.

Our previous experience may be here noted. The shocks previously experienced here by the settlers, since 1840, as well as those reported by the natives, did not lead to any inference either that they were likely to become serious, or that they were increasing. My own experience extends over a period of five years. In May, 1840, there was one sharp shock which alarmed some people, and I believe even disturbed some clay chimneys, but it was not followed by any others. Some think it was as strong as that of Monday morning, but it did not last thirty seconds. It had no brick buildings whereon to try its strength. Since I have been here I have noted from twelve to twenty every year, but they were too trifling to do damage, or create alarm. Only once, on the 4th and 5th December, 1846, an unusual number, namely eight, between five o'clock in the afternoon and nine the next morning occurred, and some were of considerable force. To these shocks the settlers had become accustomed, and they excited no alarm. The shock of May, 1840, having been the strongest up to the recent shocks, the idea of increased activity was negatived.

Several of the most intelligent natives say they never knew any thing of the kind before. That they have had strong shocks, but not such a succession of shocks. They all say that at Wanganui and Taranaki, shocks have been felt of greater force than here, and in those places the earth has been opened. As to the strength of a shock, their means of judging have been scanty. Lying on the ground under sheds of bull-rush, they would be comparatively insensible to a considerable shock. It was not, until wooden and other buildings were erected, that the force of shocks could be estimated. Indeed now we are more impressed with the force of these shocks by the prostrate brick buildings, than by any mere sensations we have experienced.

As the centre of disturbance, I think it cannot be doubtful. Across the centre of this island in a chain of volcanic disturbance in constant activity. It commences at Tongariro – a conical mountain about 10,000 feet high, visible from Wanganui, and from Cook's Straits, which continually emits jets of steam and smoke. In January 1845, Te Heu Heu told me that it was throwing out flame. This mountain is described by Dieffenbach, vol. i., and by Bidwell, in his 'Rambles in New Zealand'. From Tongariro, the chain extends along a line of lakes, hot springs, fissures and steam-jets of a very remarkable character, to the Bay of Plenty, where White Island is an active volcano, the crater being near the water's edge. This last I have seen. The direction from Tongariro to White Island is about N. E. Some of the hot-springs must exist under pressure, for their temperature is 216° at the surface. Some of the mud-jets are at the boiling point. One of the lakes is called Roto Mahana (Roto, lake; Mahana, warm). Underground noises are continually heard, new openings occur from time to time, and extensive land slips are not uncommon. In 1846, a mud slip destroyed the Pah of Te Heu Heu, on lake Taupo, and he with 50 of his people perished. Such is the normal state of the volcanic

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district – a very small increase of volcanic action would account for all that we have experienced during the last week.

If the heavy rains which we have experienced have extended to the northward, I apprehend they would be sufficient to produce such an increase of volcanic action. Any extraordinary mass of water suddenly disengaged from its customary channels and basins, and let loose upon these hot vents and fissures, would produce sudden changes in the relative density, elasticity of the air, and stem in the volcanic caverns, and be followed either by collapse, or by great efforts to escape, or perhaps by both. If it be true that Tongariro has become active, i.e., more than usually active, may we not rely on it as a safety valve?

Tuesday, 24th. – I continue the journal. We had rather a sharp shock yesterday at 3½ p.m. With that exception the day was tolerably free from shocks of a serious nature. They had continued at short intervals, but they were weaker. The night, and all this morning, the shocks were very slight, and infrequent. At 2 a.m. there was one sharpish shock for a few seconds; and after that they were so slight and seldom, that we began to think them over. At 2 p.m., however, one occurred of strength equal, perhaps, to any of the three strong shocks, but it was of very short duration. It was strong enough to do much damage, if anything had been left standing to damage. It destroyed the new plaster of Government House, which had stood the other shocks. It was followed by several others of some strength and shocks, short but strong, continued all the evening. It has destroyed the confidence which the very fine weather, and the weakening of the shocks, had partially restored.

We have news from Wanganui. The shocks of Monday, Tuesday, and Thursday, were felt there, but no damage has been done. They have no brick buildings, except one small chapel, as a means of comparing their strength with the shocks here.

At Nelson the shocks had been felt, and had done some damage to brick buildings.

(A very sharp shock while I am writing, at a quarter to 6 p.m. The motion decidedly undulating, and seeming to force up from below. During one of the shocks, after 2 p.m., I was standing on the lawn, and I felt myself jerked up. Another similar shock, now at ten minutes to six, stronger then the one five minutes ago.)

At Otago the shocks had not been felt up to Wednesday, to 18th., instant. At Cloudy Bay, the shocks of Monday and Tuesday, 16th., and 17th., were severely felt; some whalers brought their families over in an open boat during the S.E. gale, at considerable risk.

(Another shock at three minutes to six. The duration of these three last shocks was from two to five seconds – the agitation considerable.)

(Another at one minute past six.)

(A very sharp shock at half-past six – duration twenty-one seconds.)

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(Another shock at twenty minutes to seven – duration seven seconds.)

(Another shock at a quarter to seven – duration only one second.)

I have set down these seven shocks within an hour to convey an idea of the sort of turmoil we have been subject to for the last nine days. It should be observed, however, that as the severest shocks occur after a period of quiescence, so after a sharp shock, those which follow are comparatively weaker; and after a few hours of these shocks in rapid succession, they have hitherto decreased in frequency, strength, and duration, until at last we hear the rumbling explosion at times without feeling any shock. Before the shocks of this afternoon I heard no warning sound, and I have questioned others, who agree as to this point.

No one has counted the shocks during any one day, but they must have exceeded one thousand. {i.e. Since the 16th.} At times there has not been one minute between each – at others, three, four and five minutes, and so on, diminishing to one or two in the hour. On three of the days we were several hours without one.

Wednesday, 25th. – After the shock at two o'clock yesterday, Dr. Prendergast counted thirty shocks up to four o'clock. They continued every seven or eight minutes, but I did not count till about a quarter to six, as above. From ten to twelve they were very frequent, about ten in the hour. From two yesterday to eight this morning there must have been at least one hundred and fifty shocks, and I believe more. The weather is most beautiful. The shocks are clearly unaffected by the state of the atmosphere, and they occur in all weathers, with all winds, in storms and in calms. Nor can any inference be drawn from the state of the barometer.

Wednesday Afternoon. – Shocks very slight and less frequent.

In some newly dug ground in our garden is a mere surface crack, four yards long, - its direction is N. E., by E., and S. W., by W.

As every fact illustrating the nature of the motion is interesting, I mention this:- In a store-room at Alzdorf's Wellington Tavern, a large number of stout bottles of anchovies were ranged closely together on the floor, and occupying about a square yard. At about four feet distance and south from them was a cask of beer, (twelve or eighteen gallons, I forget which) half full; This cask was jerked up and deposited on the tops of the anchovy bottles without knocking down or breaking one. The motion evidently moves along a line, and at the same time undulates so as to produce this upward motion. Any one who has been in the habit of swimming in the sea during a considerable swell, must have felt something of this: the wave comes on and moves the swimmer's body forward, but not so much as it moves it upwards when under the full influence of the wave.

Some of the shocks have a cross motion, with a curious grinding sound under ground. During one of these the milk in the pans acquired a circular motion, so as to accumulate the cream in the centre. During the sharp shock yesterday I could discover no unusual motion of the sea,

though I was only a few hundred yards from the shore, i.e., on the lawn in front of the Government House. Many of the little facts I mention may be unimportant: but as I am not learned in the theory of such convulsions, I am unwilling to omit anything from which a useful inference may be deduced.

POSTSCRIPT 18th November, 1848

Since the date of the last entry in the above journal, no day has passed without shocks, but none have occurred of any consequence. Taking the whole of the shocks during the five weeks, only four have occurred of sufficient force and duration to do damage, though at times as many as fifteen have been counted in an hour, and perhaps more than 150 in the twenty-four hours. During the present month the number of shocks has ranged from two or three to seven or eight a day. They seem rather to increase in strength after rain, but this is hardly constant enough to warrant any general inference. Very frequently the sound is heard, without any perceptible motion, and the shocks have seldom (i.e. within the present month) been strong enough to be felt out of doors. The day before yesterday however, they were strong enough; and while sitting or lying on the grass, from 3 to 3.30 p.m., four distinct shocks were noticed, accompanied by a distant booming sound and the usual underground rumble.

In addition to the decrease in strength, the shocks have certainly changed their direction. They now come from the eastward, and even from E. by S. and E.S.E. As to the direction, I note my own sensations; but I may mention that, while the majority considered that the shocks had come from the N.N.E. and N.E., some thought the same shocks came from the S.S.W. and S.W.; and it must be confessed that, judging from the disturbance of loose articles, the direction is not easily determined. Still I consider the ear, in an open space, almost an infallible judge; and I think I can account for the sound appearing in some cases, to come from the S.W. by reverberation. One morning while the shocks were very frequent, in the open cleared space where I live, I heard the sound as usual from the N.E. While they were going on I had occasion to go to a four-acre clearing, where some workmen were "grubbing" the ground as a preparation for grass seed. Towards the S.W. a hill rose {rises} as a curtain, and I heard the sound from S.W. I suspected the reason, and listened attentively for other shocks, when I distinctly heard the commencement of the sound from the N.E., which presently merged as if it were its own reverberation from the hill.

There are reports of the breaking out of flame in some of the hills on the south shore of Cook's Straits, Middle Island, but they are not confirmed; and as they rest on vague and doubtful authority, they are only believed by the credulous. It seems to me much more likely that the usual vents have been choked and obstructed than that any new vents should have been formed. A report that there has been some subsidence of land at the Wairau Plain, (where the Nga-ti-toas massacred their prisoners in 1843), creating a swamp where the land was dry before, and draining a swamp in another place hard by, rests on better evidence, and accords with some slight chagce of surface on the beach at Wellington – where one side of a slight fissure was left a few inches below the other side, some pi-pi (cockle) shells having been pushed to the surface.

The alarm which prevailed during the first ten days has, I think, quite subsided; and as many as could obtain workmen, have put up their chimneys with rather more care than before, and keeping them as low as possible. The whole of the brick-work, as it lies in ruins, is a disgrace to the builders. Lime appears to have been very scantily used and that of a weak and bad description. I am inclined to think that brick buildings will not be unsafe, if a ground floor only, with good bond timber, and the work at least eighteen inches thick, with good stone-lime. A more lofty building will be, of course, dangerous, except of wood; for the late shocks were strong enough to have reduced half London to ruins. The experience of South America seems to establish, that strong shocks do not occur more than three times in a century. This would nearly exhaust the memory of a generation, and certainly our natives recollect no such succession of shocks as those we have just experienced. Now, the inhabitants of the New Zealand towns should consider, whether it is better to run the risk of an earthquake once in thirty-three years, or of a destructive fire any day. I dread the consequences of wooden towns. In the country, where buildings are isolated, the case is, of course different.

I will now add the state of the thermometer, barometer, etc., during the present month:-

November		Thermom. 9a.m.	Thermom. 2p.m.	Barometer 9a.m.		9p.m.		Wind	Weather	+0.60 may be considered an average correction for the level of the sea
Wed.	1	60	58	29	10	29	40	N.W., light S.E., p.m.	very fine	
	2	48	58	29	50	29	53	S.E. mod.	showery	Shocks daily
	3	55	64	29	53	29	50	S.E., light	very fine	
	4	63	60	29	44	29	40	Calm, N.W.	cloudy	4th sharp shock in night
Sund.	5	64	66	29	36	29	27	N.W., fresh	showery	5th. thunder and lightning, 8 to 10pm
	6	56	63	29	18	29	18	ditto	ditto	
	7	60	63	29	31	29	28	N.W., gale	fine	
	8	50	56	29	25	29	40	S.E., light	rainy	8th and 9th. Shocks numerous
	9	55	61	29	51	29	53	S.E., fresh	fine	
	10	57	60	29	50	29	38	N.W., fresh	very fine	
	11	60	68	29	38	29	46	N.W., strong	ditto	Shocks daily
Sund.	12	64	73	29	46	29	43	S.E., fresh	ditto	
	13	58	58	29	43	29	43	N.W., gale	rainy	
	14	60	60	29	47	29	45	N.W., strong	fine	
	15	60	66	29	45	29	45	ditto	very fine	
	16	62	66	29	47	27	47	N.W., light	ditto	16th. Shocks rather stronger
	17	60	66	29	47	29	47	Calm, N.W.	cloudy	
	18	60	"	29	47	"		N.W., fresh	showery	

Looking back to my daily journal, and thereby refreshing my memory, I fancy the direction of the shocks has gradually moved from the northward to the southward and eastward. They commenced at N.N.E., and perhaps even N. by E.; then some were observed to come from N.E., and N.E. by E., as my house stands; then from E., and latterly from E. to E.S.E. The few that I have noted from S.W., I attribute to reverberation, or some other deception on the ear and senses.

As to the fact that shocks occur during all weathers, I add a note of all the shocks we have observed during the last three years.

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1846.

January	30.	Sharp shock at 9.30 p.m.; gust of wind after calm before	N.W., gentle.	Very fine.
February	10.	Slight shock, 11 p.m.	S.E. fresh.	Showery.
April	9.	Slight shocks, 2 a.m., 11 a.m.	N.W. gale.	Very fine.
June	30.	Shock at 10 p.m.	S.E.	Fine.
July	1.	Shock at 9 a.m.	N.W., fresh.	Cloudy.
	2.	Ditto " 3 p.m.	N.W. fresh.	Showery.
	4.	Ditto, in night	N.W., mod.	Very fine.
August	31.	Ditto " ditto	Calm.	Showery
September	11.	Smart shock in night.	S.E., light	Very fine.
November	19.	Shock of long duration, 6 a.m.	N.W., mod.	Fine.
	20.	Slight shock in night	N.W., "	Fine.
December	4.	Seven shocks, one very smart.	N.W., gale.	Cloudy.
	5.	Shocks at 2 a.m. and 7 p.m.	N.W., gale.	Fine.
	26	Shock at 10.30 p.m.	N.W., fresh	Fine.

1847.

February	3.	Slight shock, heard rather than felt	S.E., fresh	Very fine.
	4.	Sharp shock at 6 a.m.	S.E., mod.	Fine.
March	28.	Slight shock, 8.30 a.m.	Calm.	Fine.
April	16.	Slight shock, 9 p.m.	N.W. mod.	Fine.
May	8.	Sharp shock, 1.30 p.m.	N.W., mod.	Fine.
June	1.	Shock at 7 a.m.	Calm.	Very fine.
July	24.	Shock at 11.30 p.m.; vibration long-continued.	N.W., fresh.	Rainy.
August	11.	Two slight shocks.	N.W., gale.	Fine.
October	12.	Two shocks.	N.W., gale.	Very fine.
	27.	Sharp shock, 11.30 p.m.	N.W., strong.	Very fine.
November	9.	Slight shock, 9 p.m.	N.W., gale.	Fine.
December	10.	Sharp shock, 8 a.m.	N.W., fresh.	Very fine.

1848.

January	15.	Shock at 8 a.m.	S.E., mod.	Fine.
	17.	Slight shock.	N.W., fresh.	Showery.
	19.	Ditto, at 2 p.m.	Calm, S.E.	Fine.
February	26.	Smart shock, 9.30 p.m.	N.W., mod.	Showery.
April	9.	Slight shock at 7 p.m.	N.W., strong.	Showery.
	10.	Ditto " " 7 p.m.	N.W. strong.	Showery.
	13.	Shock at 8 a.m., and 8.20 a.m.	N.W., fresh.	Showery.
	17.	Smart shock, 8.30 a.m.	Calm.	Cloudy.
May	2.	Shock at 2 p.m.	N.W., fresh.	Showery.
June	6.	Ditto, " 5 a.m.	N.W., strong.	Cloudy.
July	25.	Ditto, " 5 a.m.	S.E. mod.	Fine.
August	15.	Slight shock in night.	N.W., light.	Cloudy.
	16.	Slight shock in night.	N.W., strong.	Rainy.
October to November	15. 18.	Shocks daily, as described		

N.B. others may have occurred in the night, without being noticed.

The authorities at New Zealand House having with great promptitude and kindness favoured us with copies of despatches transmitted to the Secretary of the Company by Mr. Fox, the acting principal agent at Wellington, we are enabled to lay before our readers the latest information that has been received in relation to the recent earthquakes in New Zealand. The following circular to the Colonial Secretary will show that public confidence has been perfectly restored in the colony:-

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(Circular)
"Colonial Secretary's Office, Wellington, December 18th., 1848.
"Sir, - I have the honour to address you on a matter which, though somewhat unusual as the matter of official correspondence, you will probably deem of sufficient importance to warrant the request I am directed to make in connection with it.

"An impression appearing to have been produced in some of the colonies in the neighbourhood of New Zealand, that the consequence of the shocks of earthquake lately experienced here have been of a much more severe character than was really the case, his Excellency the Governor-in-Chief considers it to be his duty to take every means in his power to correct that erroneous impression, and to diffuse as widely as possible a knowledge of the actual circumstances.

"With this object in view, Sir George Grey directs me to request you will move his Excellency to be good enough to give publicity to the following fact, viz.:- that the detrimental effects of the occurrences above mentioned were confined almost entirely to damage done to the brick buildings and erections in this town, which formed a very small proportion of the whole; that all traces of these effects are already fast disappearing, and will be very soon hardly discernible; that public confidence is completely restored; and that all commercial and other operations have long since been resumed and carried on with their usual activity.

"A detailed account of the effects of the earthquake, and of the previous state of the damaged houses, will be found in a report published in the *New Zealand Government Gazette* (of 6th December, 1848, No. 23), a copy of which I have the honour to enclose for the information of his Excellency,

I am, etc.
(signed) Alfred Domett, *Colonial Secretary.*
The Honourable the Colonial Secretary, Etc. etc. etc.

From the report in the *New Zealand Government Gazette*, referred to in the above circular, we give a brief notice of a few facts not mentioned in the journal received from H. S. C. The report relates principally to the mode in which it is proposed to repair the damage done by the earthquake.

Almost every chimney in the town was found to be broken down close to the roof. The buildings which suffered least were either those built with bond timber in the brick-work, or lined with wood, or weather boarded; the description of building recommended, both as being better able to withstand any future shocks and as more secure from fire, "is a strong wooden frame upon a brick foundation, filled in with brick-nogging laid in mortar, and covered

outside with strong laths and plaster, and inside with boards and plaster". "The action of the earthquake appears to have extended from about the latitude of Banks' Peninsula, to the latitude of New Plymouth, its strongest force having been in Cook's Strait, and in a N.W. and S.E. direction from thence: This is inferred from the fact that the damaged buildings were injured principally on the SE and NW sides: and from the shocks having been felt more violently at Nelson than at Wanganui; hardly at all in Hawke's Bay, and as strongly at Banks' Peninsula as at Wanganui. The cracks in the ground at Wellington, at the mouths of some of the small rivers on the N.W. coast, and at the mouth of the Wairau, are described at being long and narrow, and not larger than such as are caused by a long drought. Eight hours after the first shock on the 16th October, at high water, and with a neap-tide, the sea rose at Wellington one foot above ordinary spring-tides; though this, it is suggested, might have been occasioned by a strong S.E. wind, which lasted the 15th and 16th. On the 19th and 20th the aurora australis was very brilliant in the S.E., though there was nothing to indicate that it had any connexion with the earthquake. This, no doubt, caused the lurid appearance of the sky, mentioned in the journal under that date. The earthquake appears to have been felt less upon high grounds and rocky foundations; and not at all at Otakou [Otago] and Auckland. Up to the date of the report, Nov. 21, no eruption had been heard of at any place within the limits of the earthquake. It is also mentioned in the report, that the preceding winter had been an unusually rainy season, with little wind; circumstances said to be connected with the earthquakes in South America. The amount of damage done to the town of Wellington has been estimated at "not more than £15,000 in property of all descriptions, and that includes £3,500 of the Colonial Government, and £1,000 of Her Majesty's Ordnance". Indeed, considering the length of time during which the shocks were felt, and the violence of some of them, it is only wonderful that so little damage has been done, and fully justifies the tone of confidence observable in the following extract from the despatch of the 31st Oct..

"Calm-judging people, in estimating its importance, will take into consideration the results of this event. Three lives only have been lost, which occurred by the falling of a wall as the parties killed were passing. A large vessel sailing at the very moment when the alarm was greatest, for a port which is usually the resort of any who leave New Zealand, only found about forty souls, including children, willing to take advantage of the opportunity; and the vessel having got ashore in going away, the passengers who have relanded are, I hear, likely for the most part now to remain. The danger of a voyage by sea is, in fact, greater then any that we have been subjected to; and probably everyone who travels 100 miles on a railway incurs a greater risk than he would do by living a lifetime in this place."

As a curious pendant to the above details, we may conclude with an abstract from the *New Zealand Spectator* of Wednesday, October, 28, 1848:-

"Owing to the confusion into which the type of this office were thrown by the earthquake of last Thursday, together with the subsequent excitement which prevailed, it is found

impossible to publish the Spectator as usual on Saturday last. By a great effort, however, we have succeeded in bringing out the present number at out usual time of publication".

End of Newspapers and Magazines section

Nicholls, Stephen

Source: Nicholls, S. (1851): Letter to William Adams from Stephen Nicholls, dated 12 September 1851. *In*: Adams, Martha: Journals of Martha and William Adams (1850-1852), MS-Copy–Micro-0344, Alexander Turnbull Library, NLNZ.

Location: Awatere Valley, Marlborough

Keywords: primary, ground damage, faulting

p.253.

I have this morning returned from Fairfield Downs and have selected you a run as described in the enclosed.... It is all Ravines, Chasms and Precipices, and great Chasms made by earthquakes both frightful and awful to look at.

Notes:

Fairfield Downs is situated in the upper part of the Awatere Valley between the Tone River and Yeo Stream. Yeo Stream joins the Awatere River opposite Molesworth Station. Parts of the letter, not quoted here, describe the boundaries of the proposed run, which place it in the Upcot-Gladstone area.

Oliver, Richard Aldworth

Source: Oliver, R. A. (1848): Private Journal 1848-9. Micro-MS-199, Alexander Turnbull Library, NLNZ.

Location: Wellington

Keywords: primary, mainshock, aftershocks, building damage, casualty, ground damage, atmospheric effects, response/recovery

October 19

"Prosperous, bustling, trading .....? Wellington if not finished is for the present 'done up'. Ships will no more inundate your plains with cattle, and sheep, and horses, from Sidney [Sydney, Australia]. Your stock-keepers are no longer alarmed at the inundation of imported stock, altho' the sheep were scabby, the horses .....?, and whether the black cattle would outlive the effects of the voyage was a toss up of a bad half-penny. Money was so plentiful and Contractors Butchers and the like so wealthy that thirty or forty deaths in a purchase of lately imported 'acclimated' stock, was mere 'moonshine'. Now how altered! Your Wellington Capitalists. Men who had the chances are, half a dozen years ago 'had not one sixpence to jingle against another', who the other day were cracking jokes, upon the stock auction drinking their bottled Bass and smoking their cheroots as they outlaid one another. Alas! How cressfallen? are they. One little convulsion of Nature alarmed them they quailed with the perturbed? ground they stood on, another and another came, days went on each day a fresh shock of Earthquake and with it an increased alarm till down came shop and store, Bonded warehouse and Grog shop, Hotel & Tavern, all in one heap of ruin, then might be

seen your .....? fine fellow of yesterday who came out virtually a .....ffer? and by fortuitous circumstances had been raised to the comfortable commercial man reduced lower than he had formerly been in point of character that is lost all the dignity that becomes a man. One cannot help pitying, but one must despise the man who instead of aiding a Wife and family goes about bereft of his senses and shedding fruitless tears, but let me not judge too harshly, there are times in which the gold? is .....? in the fire. One poor woman has died this day of fright. There are others of the same sex that set a noble example .....? from dignified unflinching, with no womanly fear I was going to write and I do not know what better word to .....? it....

On Monday the 16th Oct the first violent shock took place, which perturbationing? has continued ever since, and whilst writing this I have occasionally to hold my pen and delay my sentence till the shock is over. But to return to Monday at about 1-40 am of Monday morning I was awoke by a violent Motion as I slept in my bed place onbd ["on board"] and the sentry running in to answer the bell that had not been rung by me. I concluded what had taken place but had no idea that the shock had been so violent as to have done considerable damage to many of the buildings on shore, this shock was followed up by others of less intensity and during the whole night a heavy South Easter was blowing, and our sheet? anchor had been set? for the night before. The principal damage done was to the Wesleyan Church and the brick chimneys of the houses throughout the Town....

Tuesday was the first day of the Season that the Band of 68 played on Thorndon Flat. So here was a large assembly of the? fashion of Wellington. Mrs Petrie had come from the Hutt for the first time since her confinement, every one that has the pleasure of her acquaintance knows her to be the life and soul of every party she is at. The Miss Swainson and several others were standing near me and we were all chatting merrily when I felt distinctly a slight shock; it consisted of one motion to the Southward, and back to the Northward. I .....? .....? – and said there! That was palpable enough, and to my surprise was laughed at. "Oh! Yes" said Mrs P. "that was a shock and don't you see that chimney falling", pointing out one at the same time and saying I was trying to alarm them. However before I had time to assure them of my sincerity a rumbling noise like a pack of artillary [sic] galloping over a bridge was heard which was followed by a rolling motion of the Earth the green sward on which we stook undulated like the sea on a beach or rather like the undulations [next phrase very faint] of a large carpet in being shook.

We had some difficulty in keeping our feet and down came all the chimneys in sight and with them the very one that Mrs P had pointed out in joke and from which she had not taken [withdrew] her eyes or finger for all this passed in much less time than it can be said – The band stopped short in the middle of Ah! How .....?, and after a considerable delay recontinued. Not that the .....? were by any means .....?, we soon found that the Colonial Hospital (a lime two storied brick building) was so much damaged that the Patients had to be instantly removed to Govt. House. A crack was discovered on the beach from the west of Colonel Gold's Hu [house?] to McBeths? store nearby. The damage done at Te Aro was very considerable all the Chimneys were down and the Brick and stone or clay houses were become uninhabitable. Many indeed were dangerous it? .....?. There were many wonderful escapes, one a man at work on the top of the Wesleyan Church (that had been so much

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damaged the first shock) who was removing part of the loosened walls who was enabled to hold on during the shock and fortunately held on a part of the roof that did not give way. However, this shock was fatal to the child of Barrack Sergeant Lovell who was passing a Brick wall at the time and was killed on the spot her brains being dashed out?. Another child her brother died that night from injuries received at the time and the poor Sergeant having .....ped the death of his two children only survived a day or two having had the flesh literally torn from his leg by the fall of the wall.

The alarm at this time was less than might be supposed, from the damage done, there being hardly any who had not suffered more less [sic] severely. The next the wind had got up a good deal the clouds were dark and heavy and the Barometer low and falling, that day I had been engaged to dine with Mr & Mrs McCleverty and altho I expected a wetting I was determined to go as people were beginning to put on long faces.

[On returning, their boat not being sent out they decided to seek lodgings for the night.]

"Luke and Cooper staid [sic] at Barretts?. I preferred [proposed] the lower one storied quarters at Alzdorfs nor had I reason to repent of my choice for at 5 o'c[lock] the next morning we experienced the heaviest shock of Earthquake that had ever occurred at Port Nic [Nicholson] the ground upheaved and oscillated fearfully, the shattered buildings fell in, people rushed out in the greatest alarm and ran from house to house. Many left their houses not without sufficient cause, others from sheer fright. I felt perfectly secure in a low wooden building strongly built and having been told (which I found afterwards incorrect) that there were no heavy goods in the store above.

Directly I awoke I timed this shock and found from the time I took my watch till the shock ceased occupied 50 Sec allowing 10 Seconds for awaking and happening to note so which perhaps is too much would make it last a minute. In the next half hour we had 10 tremors so one every 3 minutes after that I went to sleep again and did not feel anything severe about 1/2 past 7 when I was shaving. I had to hold my hand several times, and moving about the passage in my dressing gown I found Bell and Domett who had been turned out of their houses sitting by the fire. Poor D. had been a good deal alarmed and I not knowing it said "D. don't you know that that is a brick chimney you are sitting by, when up he started and ran out from the house."

Source: Oliver, R.A. (1848): Letter Book of the sloop "Fly". MICRO-MS-199 Alexander Turnbull Library, NLNZ.
Location: Wellington
Keywords: primary, response/recovery
Wellington 20 Oct/48
To His Excellency,
The Lieut. Governor,
Wellington

Sir,
As your Excellency and Council consider it for the benefit of the inhabitants of this Colony that the shipping in Port at present shall be detained until the elements are more settled as you inform me in your confidential letters of this days date, I shall take care in compliance with your request that no vessel leaves this Harbour.

I have etc.

Signed/ R.A. Oliver, Commander.

Pa, Horomona

Source. Pa, Horomona. (1848): Letter to William Colenso from Horomona Pa, dated October 20, 1848. *In*: Colenso, William: Journals and correspondence. 91-169-1/8, Alexander Turnbull Library, NLNZ

Location: Turanganui, Wairarapa

Keywords: primary, mainshock, ground damage, building damage

Oketopa 20, 1848

Kia te Koroneho... Ko tenei wenua ko Turanganui. No te ru na ka kitea he kapura e nga Pakeha, e puta ake ana te paowa i te wenua. Heoi ka mataku nga Pakeha. Ko matou ko nga Maori, ki te tahitaha, ko matou kahore i kite atu. Heoi anake ta matou i kite ai ko te pakarutanga i te pa o Tamai Hikoia raua ko Raniera te Iho ko te Tatau...

Na Horomona Pa

[Translation]

October 20, 1848.

To Colenso... This area is Turanganui. In regard to the earthquake, a fire was seen by the Pakeha with smoke issuing from the ground. Consequently the Pakeha were frightened. We Maori, off on one side, did not see this. We saw only the destruction of the pa of Tamai hikoia and Raniera te Iho known as te Tatau...

From Horomona Pa

Notes:

The Turanganui area refers to the area of the Turanganui block purchased by the Government in 1853. The boundaries, commencing at the mouth of Te Hurupi Stream (Palliser Bay coast) extended north to the summit of the Aorangi Range, along the range to a point near a hill called Pukehinau; thence to Pukehinau; thence to the Mangaroa Stream and down to its junction with Paharakeke Stream; thence along the stream to the Ruamahanga River; thence along the margin of Lake Onoke to the sea and along the coast to Hurupi Stream (McKay, A. (1891): Claims of the Natives of Wairarapa Lakes and Adjacent Lands. *Appendix to the House of Representatives* G4: 1-71). In the abstract the Turanganui area refers to the low lying part along the Ruamahanga River between Lake Wairarapa and Lake Onoke.

The fire and smoke seen by the Pakeha probably refers to the release and spontaneous ignition of methane from a swampy area near the Ruamahanga River. The Pakeha (Europeans) who saw the fire and smoke were the Kelly's who lived on the north bank of the Turanganui River (Survey Map 10474, Waipawa). This is south of the pa that was destroyed (see Rihara Taki extract).

Tamai Hikoia (Te Hiko Piata Tama-i-hikoia), a leading Ngati Kahungunu chief in the southern Wairarapa in the 1840's (and into the 1880's) had a pa (Te Waitapu pa) near Tuhitatara and bordering the Ruamahanga River.

This was a fortified pa close to where Angus and Mary McMasters settled in the mid 1840's (McMasters was known to the Wairarapa Maori as "Hiko's Pakeha") (*New Zealand Biography*, p.449). This pa was one of two that were "destroyed".

Raniera to Iho ko te Tatau was another Wairarapa Chief in the lower Wairarapa Valley. His land (Native Reserve or Reserve for Raniera te Iho) was within the Turanganui Block purchase and is shown as extending from the Palliser Bay coast north to the Turanganui River and bordered to the west by Lake Onoke. The location of his "pa" was probably on the south side of the Turanganui River.

The Maori word for destruction ("pakarutanga") used in the extract could be the noun meaning "place of breaking forth"; "pakarukaru" (v.t.) means break in pieces; "pakaru" (a.) means shivered, broken, shattered (Williams, H.W. 1988: *A Dictionary of the Maori Language*. GP Books, Wellington)

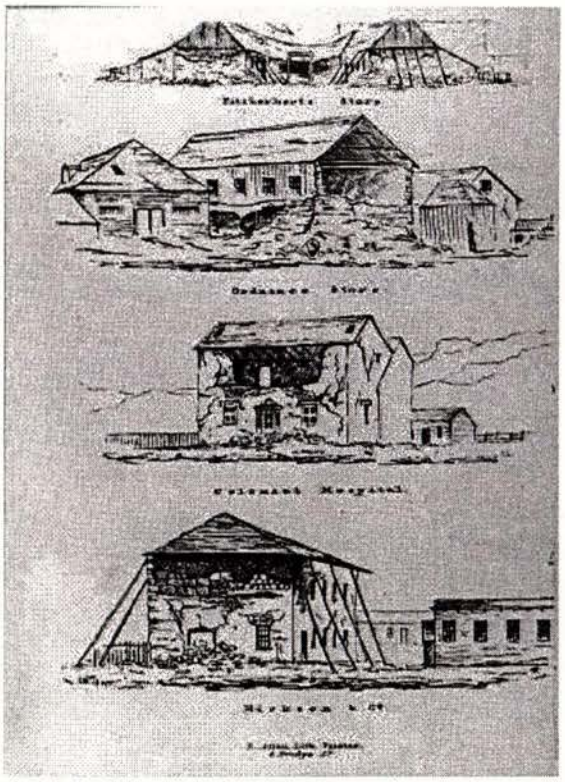
The *Wellington Independent* (October 28) reports that "the shocks of earthquake had been felt rather severely in the [Wairarapa] valley, though no damage had been sustained excepting the upsetting of milk and cream pans. The natives were dreadfully alarmed, foresook their pah, and took to the bush. They all assert that none of them remember such severe shocks".

Park, Robert

Source: Park, R. (1848): Sketches of earthquake damaged buildings in Wellington by Robert Park, surveyor for the New Zealand Company that originally appeared in the *New South Wales Sporting and Literary Magazine and Racing Calendar* (see Fitzherbert entry), PUBL-0050-01, Alexander Turnbull Library, NLNZ

Location: Wellington

Keywords: primary, artworks, building damage, mainshock, aftershocks



Notes:

Fitzherbert's store (Manners Street, Te Aro) was a single storey building, bricknogged with a brick boundary wall. The SE and NW ends collapsed together with the boundary wall.

The Ordnance store (Manners Street, Te Aro) was a two storeyed building constructed of 13 ½" thick brickwork with no wood bonding and a slate roof.

The gables were thrown out and the north wall cracked in several places, although side walls were little damaged,

The Colonial Hospital (Pipitea Street, Thorndon) had recently been completed and was rendered unsafe by the second severe shock on Tuesday afternoon, 17th October. The patients were removed to Government House. It was a two storeyed building, with hollow brick walls 14 in. thick, with no bond timbers. There was a long room in the front of the upper storey. The NE gable and the front of the upper storey were thrown out on the south and east sides. The walls were cracked on all sides. It had to be pulled down.

Hickson's store (Manners Street, Te Aro) was a two storey brick building. Both gables were thrown down. According the *Spectator* the building was "thrown down" and the remaining walls rent in various directions by the severe aftershock at 5 a.m. on Thursday 19th .

Parnell, Samuel Duncan

Source: Parnell, S. D. (1848): Farm diary and notebook 1844-63. MS-1761, Alexander Turnbull Library NLNZ.

Location: Wellington

Keywords: primary, mainshocks, aftershocks, building damage

[at Karori, Wellington]

October 16. A severe Earthquake at 20 minutes before two o'clock this morning. Lasted several minutes. Did a Deal of Damage in Wellington and other parts. Several slight shocks in the day.

October 17. A severe Earthquake at 20 minutes before two o'clock this morning. Lasted Several Minutes. Did a Deal of Damage in Wellington and other parts.

October 17. Slight shocks During the day one Severe Shock this Afternoon at 25 Minutes to Four lasted for 18 Minutes. Several afterwards Destroyed all Brick Building [sic] in Wellington continued More or Less all night and ..."

October 18. Several smart shocks.

October 19 (4-5 a.m.) ... the Most Severe Shock I have felt, the earth Vibrating all Day with a thumbling [sic] noise incessantly.

October 20, 21, 22, 23. Shocks at intervals.

October 24. A Severe Shock about 2 o'clock this Afternoon at Nights we had them Very quick Indeed.

[The next section seems to duplicate most of the above.]

Tuesday 17th slight shocks During the day one Severe Shock this Afternoon at 25 minutes to Four Lasted for 18 minutes several afterwards Destroyed all Brick Building in Wellington Continued more or less all night and Wednesday 18th several Smart Shocks.

Thursday 19th between 4 and five in the Morning the most Severe Shock I have felt, the earth Vibrating all Day with a Rumbling Noise incessantly.

October 20-24. Friday, Saturday Sunday and Monday Shocks at intervals Tuesday 24, A Severe shock about 2 o'clock this Afternoon at Night we had them Very quick Indeed.

Pearse, Samuel

Source: Pearse, S. (1848): Marginal notes in the *New Zealand Church Almanac* of 1848. *In:* Journal and notes of Samuel Pearse 1846-1861. qMS-1638, Alexander Turnbull Library, NLNZ

Location: Nelson

Keywords: primary, mainshock, aftershocks

[At Nelson] October 1848
16th M – earthquake
17th Tu – earthquake
18th W – earthquake
19th Th – earthquake
19th F – earthquake
20th Sa – earthquake
21st Su – earthquake
23rd M – earthquake
24th Tu – earthquake
25th W – earthquake
26th Th – earthquake
27th F – earthquake
November 1848
1st W – earthquake
December 1848
10th - earthquake morning

Pharazyn, Charles Johnson
Source: Pharazyn, C. J. (1848): Journal 1840-50, MS-1774. Alexander Turnbull Library, NLNZ
Location: Palliser Bay, Wairarapa
Keywords: primary, mainshock, aftershocks, atmospheric effects

p. 116
October 16 1848
Two severe shocks of an earthquake in the middle of the night, first lasted nearly half a minute, Mamma much alarmed.

October 18-19
19. a most terrific nights storm ... Earthquake violent.

Plimmer, John
Source: Young, J. (1901): *The Life of John Plimmer*. N.Z. Times Co. Ltd., Wellington. 248 pp.
Location: Wellington
Keywords: primary/reminiscence, mainshock, response/recovery

p. 28.
The earthquake gave the building a terrible shaking, and the officers got a terrible scaring, barely escaping with their lives. In common with my neighbours, I was a heavy loser by the earthquake; my lime trade was ruined; my property almost destroyed, and we were all at our

wits' end ... At that time I was employed to rebuild several of the houses that had been thrown down. I also built several new ones. These houses were built of wood, as people were afraid to live in brick houses.

Source: Plimmer, J. (1906): Article entitled "Quakes in Wellington" - the big shocks of '48 and '55". *In: New Zealand Mail* May 9, 1906).
Location: Wellington
Keywords: primary/reminiscence, mainshock, aftershocks, building damage, atmospheric effects, response/recovery

In the "Life of John Plimmer" (of Wellington), a private publication, that gentleman referred to his experiences on the two occasions when Wellington was most severely shaken – in 1848 and 1855. He says: -

"When the first earthquake shocks occurred in 1848, our buildings were, for the most part, of such primitive character that comparatively little real damage was done. Except the loss of chimneys and the destruction of glass and china. It was however very severe while it lasted. I well remember the day. My wife and I were sitting talking in our house, Mrs. Plimmer nursing a baby, when suddenly books, china, glassware, and other articles were hurled from the shelves across the room. My poor wife came in for the worst of the pelting; and even in the moment of extreme peril I remember noticing that the maternal instinct caused her to bend over the child to defend it from the fury of the unexpected attack. Such was the violence of the commotion that I was totally unable to render her any assistance. Immediately after the earthquake came a heavy storm from the south. Te Aro Flat was literally flooded. I had recently built a culvert near where the gasworks now stand to carry off the water from the bog and it was not long before I received a message from Mr. Fitzherbert stating that it had been washed away. I at once set out to ascertain the amount of the damage and to see if anything could be done. I discovered that the earth on each side had been washed away but the culvert which was built of Roman cement still stood, and though it was three feet in diameter, not more than a sixth part of the water could possibly pass through it. The storm was still increasing, and my top coat, being saturated with water, became so heavy that I found it difficult to get about. When I returned to the stream, where Kebbell's mill was afterwards built (nearly opposite the old Fire Brigade station in Manners Street), I did not know how to cross it. I got on to a high bank for the purpose of taking a running jump, but the undermined bank gave way, and threw me into the middle of the stream, I rolled over and over like a cork for perhaps twenty yards, when the water three me on the bank on the right side in a very miserable state.

"It must be remembered that in those days, there were few roads, and such as they were generally narrow tracks between flax and ti-tree, and difficult to follow in the dark. Our baker had dug a large hole near his house for clay to build his oven. This in a short time became filled with water. I remember going to the baker's one very dark night, when, as I neared the

door, I heard a tremendous splashing in the water-hole – a previous customer having mistaken the path, had fallen into the hole. We soon fished him out, minus his bread, not much worse for his ducking.

"After 1848, as people did not like to live in brick or clay houses, the real age of wooden houses commenced. After a while, however, merchants and shopkeepers began to build in brick, as a protection against fire, as insurance was very high on wooden buildings. Thus, when the second disastrous earthquake occurred in 1855, it did immense damage, as most of the buildings were either demolished or so much shaken as to be untenantable.

"There were three distinct heavy shocks, beginning on Monday, and a continuous quivering between them that, in a manner, linked them together. That on the Monday was the lightest of the three, and did not do much damage; but on Tuesday there was a much heavier shock and many chimneys fell and large brick stores were seriously damaged, especially those with heavy slate roofs, by breaking the bond of the brickwork and splitting the angles. This was the case with a large bonded store belonging to Captain Rhodes which was full of bonded goods. I was sent for to see if I could do anything to prevent it falling. I thought I might clamp it together with iron rods and plates, and these were at once prepared, and bricklayers engaged to make holes through the walls for their reception. I had just climbed a long ladder, or rather two ladders lashed together, and had just reached the eaves on the building (where I proposed to insert the rods) and had caught hold of the slates to assist me leaning over to get a clearer view when the third and MOST VIOLENT SHAKE commenced. With some difficulty I gained a firm footing on the ladder when I saw that it was almost certain death to go down. So I held tight to the slates on both sides of the ladder, and held on for my life. Sometimes the rocking building leaned over so far that I could scarcely hold the ladder to the wall. It was a horrid and perilous position, but I did not loose my presence of mind and held on until the shake slackened in force, for I though I might have some chance if I went down with the building.

"In the meantime the gable end fell with a tremendous crash close to where the head of the ladder was set and the shake diminished to a light quivering. I stood still for a short time to recover my breath, when from my elevated position I took a good view of the town all around me. The sight was at once appalling and distressing; chimneys were down, houses seriously damaged, and the gable end of the new Wesleyan Chapel in Manners Street (site now occupied by Mr. L. Christeson?) had collapsed, and the building was otherwise seriously injured. But the most curious thing that attracted my attention was the way in which Te Aro bog (the area between Taranaki Street and Kent Terrace) was moving. It was rolling like a heavy sea, but looked more like a field of waving corn in a high wind. I made an examination to see how the ladder on which I stood was secured from slipping sideways and was astonished to discover that it had ground its sides through two thicknesses of slates to the wall plates of the building. I merely add that I lost no time in descending to terra firma, although at that particular time it did not suggest the idea of firmness. This was the great historic earthquake of 1855 that raised the land in and around Wellington four of five feet[*].

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*This is incorrect. The entire account relates to the 1848 earthquakes. Plimmer's description of the first shock he felt probably refers to the second large aftershock on Tuesday, unless he was awake talking to his wife at 1.40 a.m.

Source: McKinnon, J. (1991): *John Plimmer and his family - 150 years - 1841-1991.* Privately published by the Plimmer Family Reunion Committee, Wellington. [Extracts supplied by Amanda Plimmer.]

Location: Wellington

Keywords: primary/reminiscence, mainshock, building damage, response/recovery aftershocks

[Note: comments in { } in the following extract have been inserted by McKinnon. The assigned dates are incorrect.]

p.16

There were three distinct heavy shocks, beginning on Monday {19 February} and a continuous quivering between that, in a manner, linked them together. That on the Monday was the lightest of the three, and did not do much damage, but on Tuesday there was a much heavier shock, and many chimneys fell, and large brick stores were seriously damaged, especially those with heavy slate roofs, by breaking the bond of the brickwork and splitting the angles. This was the case with a large bonded store belonging to Captain Rhodes.... I was sent for to see if I could do anything to prevent it falling.... I had just climbed a long ladder, or rather two ladders lashed together, and had just reached the eaves of the building....; I had caught hold of the slates, and was in the act of leaning over to get a clearer view, when the third and most violent shake commenced {it was Friday 23 February at 9.11 p.m.}. With some difficulty I regained a firm footing on the ladder, when I saw it was certain death to go down. So I held fast to the slates on both sides of the ladder, and held on for my life. Sometimes the rocking building leaned over so far that I could scarcely hold the ladder to the wall. It was a horrid and perilous situation, but I did not lose my presence of mind, and held on till the shake slackened in force, for I thought I might have some chance if I went down with the building.

.. the most curious thing that attracted my attention was the way in which the Te Aro bog was moving. It was rolling like a heavy sea, but looked more like a field of waving corn in a high wind. I made an examination to see how the ladder on which I stood was secured from slipping sideways, and was astonished to discover that it had ground its sides through two thicknesses of slates to the wall plates of the building. I need merely add that I lost no time in descending to terra firma - although, at that particular time, it did not suggest the idea of firmness.

When I had descended to the ground ... a great revulsion of feeling came over me, but I was soon myself again. My first thought was about my wife and children, and I set off at a great rate towards "Clay Point".... As soon as I could force my way though the crowd, I hastened to my home to ascertain how my family had fared in the general overthrow. I was rejoiced to find them all safe and sound on "Clay Hill', and although all around me was in ruins, I did not

seem to mind. In common with my neighbours, I looked upon the labour of years destroyed at one fell stroke. But we all breasted the waves of adversity with good courage, and, in an incredibly short time, the disastrous effects of the great earthquakes of 1855 began to disappear.

Notes:

There is a clear confusion in the above extract between the 1848 and 1855 earthquake. Most of this extract and the following one refer to the effects of the 1848 earthquakes.

p.12

John Plimmer's property had been affected. The earthquake gave the building which he had let for government offices a severe shaking. Although the building was badly damaged, and was at that time crowded with clerks, they all managed, by means of two sets of stairs, to get out unharmed[*]. In common with his neighbours, John Plimmer lost heavily in the earthquake. His lime trade was ruined, his property almost destroyed, and he was at his wit's end. But there were compensations. John Plimmer's brick chimneys alone did not fall over in the shake. His damages were calculated by the Government at £1800 – an indication of what he had achieved in his first seven years in the colony. And the damage done did at least generate new business for one who was already one of the principal builders of the settlement. John Plimmer repaired several of the houses that had been damaged. He also built several new houses of timber, as people were afraid to live in brick houses.

Notes:

* This must have been during the severe shock on the afternoon of Tuesday 17th October.

Pratt, Rugby

Source: Pratt, R. (1877): An Old Colonist [Pratt, Rugby]. *Colonial Experiences*. London: Chapman and Hall. 266 pp.

Location: Wellington

Keywords: primary/reminiscence, mainshock, aftershocks, atmospheric effects, building damage

p. 144.

It was shortly after my settling in Wellington, on October 16, 1848, that the first serious earthquakes in New Zealand occurred....

I remember when the earthquake occurred the weather was very wet and stormy, and had been for the two preceding days; a hurricane of wind and an almost ceaseless downpour of rain flooding the streets and leveling fences in various parts of the town. When I retired to rest on Sunday night, the 15th, there was no abatement of the storm, and my first impression upon being awakened by the unusual vibration was, that it was caused by a more than ordinary violent gust of wind, and that the building was going to collapse, but in an instant I realised its true cause.

Sleeping in the upper part of a store adjoining the main building, I had often noticed with a critical eye the bad workmanship of the roof, and sometimes when the wind was blowing as it only can blow in Wellington, I was afraid it would be carried clean away; but now with an earthquake superadded it may be taken for granted that I was uncommonly nimble in reaching and opening the outer door.

The storm still raged without, but not caring to face the wind and rain in such light attire, I stood just within the shelter of the passage, ready for a spring when the crash came which I was momentarily expecting. After an interval of eight or ten minutes, the shocks not being repeated, and feeling cooler and calmer, I ventured to retire to bed once more, though still very skeptical as to the safety of the building.

On entering the store soon after daylight a frightful scene of wreck and breakage presented itself, the shelves were nearly cleared of all their long array of bottles, the floor being covered with the debris of what had been bottled fruits, pickles, salad oil, etc. etc., and a large tank that contained about two hogsheads of whale oil, and which had been recently filled, had been hurled from its usual position to the opposite side of the store, and about half its contents spilt in its flight.

After throwing down sundry bags of sawdust, and working vigorously with barrows and shovels, by midday the wreck was cleared away, and something like order once more restored, when our attention was called to the dangerous state of one of the chimneys. The portion that projected above the roof, about six feet, had been broken off near the roof, and turned round on the stack without being thrown down, thus indicating a rotary as well as an undulating motion. A slight tremor of the earth continued at short intervals during the day and night, preceded by a low rumbling but unmistakable sound.
At noon on Tuesday, the 17th, a customer was settling an account at the store, and I was just handing him the receipt, and remarking about the earthquake and its effects, when a violent shock occurred that caused us both to rush out of the store from its violence; his dray and team of bullocks which had been left standing in front of the store, had gone tearing down the inclined street, the animals having been frightened by the strange movement of the earth. Upon my returning to the desk where I had been writing, I found the floor strewn with loaves of sugar, and the desk much indented by their falling upon it from the top shelves. All the bottles and goods on the lower shelves had been made secure by passing wire along the front of them, but the heavy goods upon the top shelves had been thought safe. Brick walls and chimnies, that had only been partially damaged, were mostly shaken down by this one ...

On Friday, the 20th, about 5 a.m., occurred the third violent shock of the series, for during the intermediate time there had been a constant repetition of slight tremors, so that the earth was scarcely quiescent the whole time ...

At one of the hotels some very large ornamental casks, ranged upon a stand at the back of the bar, were thrown clean over the counter to the front of the bar....

Walking along Lambton Quay I passed a hotel kept by a Prussian named Albert Hesse, where the breakage and loss during the week had been so great, that I suppose he thought he might as well distribute the balance of it gratis, and even at that early hour there were plenty of thirsty souls ready to take advantage of his liberality.

Richmond, Matthew

Source: Richmond, M. (1849): Letter dated 12 January 1849 to Reverend Richard Taylor, written at Nelson. Sir George Grey New Zealand Manuscripts. Rev. R. Taylor Collection. Letters 1814-1873. GNZ MSS 297/4, Auckland Public Library.

Location: Wairau Valley, Awatere Valley, Marlborough

Keywords: primary, ground damage, faulting, building damage, response/recovery

I have just returned [to Nelson] from the Wairau and Kapunatekau [Kaiparatahau, i.e. the lower Awatere Valley] Districts, and it is quite awful to see the manner in which the earth is rent in many places.

Notes:

An extract from the diary of John Saxton (December 22 1848) also records Richmond's account of his visit to the area using the same adjective "the awful effects of the earthquake at the Wairau".

Saxton, John Waring.

Source: Saxton, J. W. (1848): Diary 1841-1851. Alexander Turnbull Library, NLNZ

Location: Nelson, Wairau Valley, Awatere Valley, Marlborough

Keywords: primary, mainshock, aftershocks, building damage, ground damage, faulting.

1848

[at Nelson]

16th October, Monday. We had all gone to bed last night when we were aroused by a grinding crashing sound which made me believe that the broken block of wall by the drawing room corner was falling. I got up hastily to see when I heard the same grinding and crackling noise extend over the whole house. I wondered if the falling wall was dragging down the whole house. The grinding increased; I felt the floor yield, the bed and wardrobe seemed to be yielding when I thought there was not an instant to lose, and calling Priscilla with baby, John Waring, we got into the dining room and calling up Conrad and Tizzy from the other bedroom, I got a candle from the box. I lighted it at the kitchen fire after nearly five minutes of rocking vibration. The others said it was an earthquake which with my wrong first impression I did not perceive until I crept bare-footed till I saw the ship's lamp still swinging and the clock stopped at a 1/4 to 2. This was certainly the longest and strongest earthquake we have experienced. On examination I was surprised and thankful to see that the whole damage was the fall of some loose blocks of plaster in the hall and drawing room.... In the morning we went to town. Campbell's store was slightly injured and some chimneys.

October 17
As I write at night this cottage is in a tremor the whole time unnerving me and giving a giddy sensation like the approach of seasickness.

Dec. 22nd
He [Major Richmond] described the awful effects of the Earthquake at the Wairau; a crack quite straight crossed the country for miles; in some places he had difficulty in crossing it with his horse; on one place the crack passed through an old warre [whare or Maori dwelling] dividing it in two pieces standing 4 feet apart; in a native potato ground holes appeared all over it from which sand seemed to have been expelled.

Notes:

Saxton's reference to the "Wairau" probably refers to the area of Wairau Purchase that included both the Wairau and lower Awatere valleys. Major Matthew Richmond, resident magistrate of Nelson, visited the "Wairau" area in November 1848 and to visit his run "Richmond Brook". The 11th December entry in Saxton's diary mentions that "Major Richmond told me he had been all over the Wairau and was delighted with it but did not like its rapid rivers". Early in 1848 Richmond had employed William McRae (see Hector entry) to take up and stock his "run" for him. "Richmond Brook" was situated on the south side of the Awatere River bordering the Flaxbourne run of Frederick Weld. Richmond spent three days with Weld where he was shown over much of Weld's property (Kennington, A. L. 1978: *The Awatere. A district and its people.* Blenheim, New Zealand, Marlborough County Council). It is interesting to note that Weld records that "large fissures are every where seen in the ground and one of them stretched right across the ware at the outstation" (see Weld entry). This could be a corroboration of Saxton's statement about "the crack" passing through an old warre. If so, it was different from the one "quite straight that crossed the country for miles" that is likely to represent rupturing along the Awatere Fault (see Hochstetter, Jolliffe, Jones, Lyell, *Nelson Examiner and New Zealand Chronicle* November 3rd 1848 issue entries).

1850 April 9
Dr. Monro described a stroll though the rocky ravines near his run in the Wairau, and the fearful proof of the violence of the late earthquake.

Notes:

Dr. Monro's station in the Wairau Valley was called "Bankhouse". It extended from the north side of the Waihopai River (Hon. Constantine Dillon bordering the south side) to Marchburn River on the north side (see Wright-St-Clair, R. E. (1971): *Thoroughly a man of the World.*).

Stephens, Samuel

Source: Stephens, S. (1848): Letter dated 13th November 1848. Extract from diary. *In:* Letters and Journals Vol. 2 15 Jan 1844–15 May 1852. MS-2045, Alexander Turnbull Library, NLNZ

Location: Nelson, Wairau Valley, Queen Charlotte Sound, New Plymouth, Wanganui, Otago

Keywords: primary, aftershocks, building damage, ground damage

p. 450
[at Nelson]
27th October - The intelligence from Wellington is of a very disastrous and lamentable kind relative to the effects of the Earthquake. The more violent of the shocks appear to have

occurred exactly at the time they did here, ... As at this place the greater convulsions have been followed by constant intervals of agitation in earth ... here ... the movements were decidedly horizontal or undulating ... The *Blundell* sailed from Otago on the day that the first great shocks occurred, but they do not appear to have felt anything of them there.

31st October – This evening at half past six we have another smart shock of the Earthquake which again frightened the people in the town but did not damage. The scarcely perceptible movements to some, which we have so often felt since the 16th of the month, are still going on, but the intervals of time between them are greater. We have had no later intelligence from the other side of the Straits but by boats from Cloudy Bay learn that the effects of the Earthquakes were very severely felt there as well as in the Wairau Plain and Queen Charlotte's Sound – several houses having been thrown down, and fissures and slips caused in the cliffs. Several of the Sheep and Dairy stations in the Wairau District have been destroyed and much injured.

"10th November - ... No damage has been done at New Plymouth or Wanganui, although they felt the shocks severely as we did."

... I do not feel that the effects of the Phenomenon are quite over – because we now and then feel a certain agitation of the earth; which no one can mistake such has been felt in the lower part of the town this very day to a considerable extent, as I am told by credible persons.

Source: Stephens, Samuel (1849): Incomplete extract from a British newspaper *The Bristol,* dated 17 March 1849 (presumed to be written by Stephens). *In:* Stephens, Samuel, MS-Papers - 2698-IA, Alexander Turnbull Library, NLNZ.
Location: Nelson, at sea
Keywords: primary, mainshock, aftershocks, atmospheric effects, response/recovery, building damage
We were unceremoniously awoke at 1.40 a.m. by a violent convulsion of the earth, or rather [a] series of convulsions, which shook our bed and house in a very terrific manner, and, from its long continuance, so as to induce a decided feeling of unsafety. The violence of the first series of shocks lasted at least two minutes, and they were succeeded by six others of less force within the space of half an hour. At 2.30 a.m. there were two more distinct concussions, and at 4.45 a.m. we felt another of considerable violence. Again at 10.45 a.m. the earth was greatly agitated, and continued so at intervals varying from five minutes to half an hour during the remainder of the day and night. On going into the town, I found the people generally in a great state of alarm; and learnt that, on feeling the first shock, almost everybody - man, woman, and child - rushed from their beds and houses in a state of half nudity, and remained in the streets until daylight, fearing lest their dwellings would be shaken down about their ears. There were not many vessels in the harbour, but one or two experienced the effects of the shocks in a singular manner, the sailors fancying that the keels of their craft struck repeatedly against the bottom. This, I understand, is the usual sensation when a vessel at sea is affected by the shock of an earthquake.

"17th. The earth to-day has been [in] a perpetual state of vibration, independent of several more distinct shocks. At 3.40 p.m. I was in the town, and sitting in a room at the hotel with several gentlemen, when a violent shock occurred. On going into the street, I was in time to notice the houses on either side oscillating greatly from one side to the other in a rather alarming way, but no further damage seems to have been done to the walls. Several persons stated that they clearly distinguished the undulatory movements of the ground. At 7.40 p.m. we had another severe shock, the minor vibrations continuing at intervals all the night.

"18th. To-day there were no shocks of much strength, but constant vibratory motion distinctly perceptible. At 9 or 10 at night the *aurora australis* made its appearance in the south. Many persons are much affected by the tremulous movements of the earth, especially those of sensitive constitutions like my own. The effect produced is one of extreme dizziness, with pulsation at the heart much increased, and great throbbing at the temples. In some instances it is attended with sickness and diarrhoea.

"19th. At 4.55 a.m. a very smart concussion, lasting nearly half a minute, roused us again from sleep, shaking the house almost as much as the first shock. The people of the town and country are getting more and more frightened, and cannot tell at all what to make of it. There are some natives in the town, but they do not seem much alarmed; although they say that they have not in their time known an earthquake last so long. As usual, this last shock was followed by other smaller ones, and vibrations during the day. At about 7 o'clock this evening there was a very heavy thunder-storm of hail and rain, which passed over the greater part of the town from the direction of south-east, but without doing much damage. Our cottage was out of the line of the storm, but at the distance of about fifty yards, we could perceive and hear the rain and hail falling in torrents. After the storm was over the sky became clear, and the aurora again displayed its singular beauties. This succession and combination of natural phenomena have increased the former fright to actual terror among many of the more timid and ignorant of the inhabitants. The singular noise caused by the falling of the hail during the storm induced many to believe that the waters were rushing from the mountains, and rolling down the narrow gorge of the Mai-tai river, which flows through the town, threatening to engulf the place. Some of the female part of the population are represented to have been at this period in a frantic state of fright and terror, screaming and tearing through the streets with their children clinging to them.

"20th. The earth seems still to labour under the same causes of commotion as before, the undulatory movements, although not very distinctly perceptible, unless to persons sitting or lying down within doors, occurring at short intervals constantly during the day and until midnight. The direction of the shocks appear to have been from the north-east; and on previous occasions, when a rumbling sound has accompanied the tremors, it has invariably proceeded from that point, which is, in fact, the direction where Tongariro, the principal crater in the northern island is situated.

"21st. Little has occurred to-day different from yesterday, but we have been exempt from any serious shocks, at the same time that the vibrations have been as constant as before. There is no improvement in the people's feelings as to alarm.

"22nd. Being Sunday, I understand the different places of worship have had a very large accession to the usual numbers of their congregations. The inhabitants seem so fully persuaded that something terrible is going to happen, that they are full of anxiety and restlessness, and consequently, I suppose, anxious to make atonement for their past neglect. At 3.55 p.m. a severe shock reminded us that the phenomena were not yet over.

"23rd and 24th. There is nothing new to chronicle up to the present moment, but the vibrations are still repeatedly felt at short intervals. During the very early parts of this morning, in bed, I felt several small but distinct shocks, causing the timbers of the house to creak a little. Hitherto all the earthquakes that we have experienced are of that description which I think the Spaniards call "trembura or tremblura," and which they do not consider particularly dangerous."

Strang, Robert R.
Source: Strang, R. R. (1848): Business papers 1844-1849. Letters from R. R. Strang. *In:* Sir Donald McLean 1820-1877 Papers, MS-Papers-0032-1001A, Alexander Turnbull Library, NLNZ
Location: Wellington
Keywords: primary, building damage

Letter: October 25
My Dear Sir,
... The awful calamity which has visited this town of which you ... in the papers ... me to write to you ... as I ... have wished but I will ... with the 2 ... exchanges in the ... in ... Mr. David Johnstone, ... whom, my house which has ... .is in ruins, ... wish the ... living in a small wooden house used as a stable.

Letter: November 3, 1848
My Dear Major,
My last letter and the newspapers will have informed you of the calamity which has visited us....

I informed you your house has sustained damage and that ... to have it. I now enclose you the report of Mr. ... and W. Wilson is to ... of ... of your unfortunate ...; Whether you will repair or take down and build ... is ... a matter for your.... The effect of the earthquakes upon buildings composed either ... or ... of bricks is such that I....

Letter: July 2, 1849
The earthquakes have caused a great degree of ..? on the paid up tenants ... themselves all risk ...?, are the calamity of having a good ... for 5 years induces me not to be scrupulous about

ordinary repairs with so respectable a .....? at Mr. Johnstones for as officers Barracks are immediately to be ?built ...? proper ...? ...? ?face in ...?....?

Notes:

Strang's handwriting is very difficult to read. Robert Strang was a solicitor and registrar for the Scotch Church, Lambton Quay. The brick and clay foundations of his house (called *Dalmuir* and one of the oldest houses in Wellington in Woolcombe Street (the southern part of Wellington Terrace, now called The Terrace) was damaged by the earthquakes and the parts affected were repaired with wood.

Major Richmond's house was a single story, part bricknogged, part weatherboard, house on Thorndon Flat. It was described as "very much loosened; ill built at first" in the damage report of William Miles, Sergeant of Police (see *Papers relative the Recent earthquakes in Wellington* extract). In the *Memorial and Schedule of losses by earthquake, Wellington* (see Hickson extract), the damage is described as "bricknogging cracked and thrown out, on the S. and E. sides".

Strange, F

Source: Strange, F. (1850): A narrative of a trip sixty-four miles to the west of Port Cooper. Article in *Sydney Morning Herald*, January 26, 1850.

Location: Canterbury

Keywords: primary, ground damage, background

Tuesday [Thursday], 8th March ... after fording a large creek we traversed a plain three miles in extent, completely covered in stones. I then took the best spur of the mountains I could see, to get to the westward, and after ascending 4,000 ft. I found I could follow it on about a west by north-west course; and after travelling about sixteen miles over the most dreadful country I ever witnessed, I brought Mount Taulis [Mount Torlesse] to bear by compass east by north. The small hills that I first ascended were composed of sandstone, but the sides and top of the ridge that took me westward were composed of loose stones, which the snow was fast leaving. I now turned to the left and reached the summit of a high snowy peak. The sight that met my view was very singular and wild; whole side of mountains appeared to have slipped into the immense gullies below, whilst immense blocks of rock had been precipitated, cutting their way through the black-birch trees which line the gullies and carrying everything with them. The disruptions of many of these rocks appeared to be very recent from the appearance of some of the trees that had been snapped. I feel confident that these traces of recent convulsions on the mountains are the effects of the late earthquake which did so much damage at Wellington. From the information I was able to gather from different parties who reside at Bank's Peninsula, Nelson, Wellington and Entry Island, in Cook's Straits, I believe that the seat of the earthquake is to be found in Middle Island, between Cloudy Bay and the mountains called by Captain Cook the Lookers-on [Kaikoura Mountains]. From what I could learn from parties residing on the Middle Island, the shocks appeared to vibrate from the north-west [?east] to the south-west and to have followed each other in quick succession.

Notes:

Strange was a naturalist with the H.M.S. *Acheron*. His journey was made in March 1849 starting from Port Cooper [Lyttleton] through Riccarton and up the Waimakariri River to the Torlesse Range (called by Strange the "Snowy Mountains") where he describes the inferred earthquake-induced landslide damage. The area described

is near the Porters Pass Fault and would appear to be one, or both of the landslide sites figured by Cowan and Nicol ()(see also C. Warren Adams extract).

Swainson, William

Source: Swainson, W. (1848): Letter. In: Swainson Family Papers. Micro-MS-0102, Alexander Turnbull Library, NLNZ

Location: Hutt Valley, Wellington

Keywords: primary, building damage, mainshock, aftershocks

[At Hutt Valley]

The colony has also been visited by another calamity which I fear will prove a great drawback to it, namely earthquakes which have been felt more or less during the last three weeks. They have entirely destroyed or rendered uninhabitable all the brick houses in Wellington and also demolished all the chimnies in the place. The first took place in the night and have been felt more or less in all the neighbouring settlements. It is somewhat extraordinary that though felt so severely in town, I hardly felt them at all where I am stationed and had no idea that so much mischief had been done a few miles distant. I have not been to town since, but from all accounts the place has a very desolate appearance; many people are going away from the colony in consequence.

Notes:

The *New Zealand Spectator and Cooks Strait Guardian* (18 October) reports that the earthquake was "severely felt at the Hutt" with "nearly all the chimnies being thrown down". The fact that Swainson hardly felt the earthquake in the Hutt Valley is extraordinary.

Taine, James John

Source: Taine, J.J. (1860 or later): 1848 diary [clearly written in retrospect.]. Original in possession of G. J. Taine, Napier

Location: Wellington, Taranaki, Marlborough, Nelson, Hutt Valley

Keywords: primary/reminiscence, building damage, response/recovery, casualty, fire

[at Wellington]

October 15th – Sunday On the afternoon of this day a very slight shock of earthquake was felt.

October 16th At about two o'clock in the morning a very severe shock was experienced, cracking many of the walls of the brick buildings in the town, this quake being followed at intervals by lighter ones.

October 17th Two smart shocks were experienced at four and eight o'clock in the morning, and at about four o'clock in the afternoon a most violent earthquake occurred, the land undulations being plainly visible to the naked eye, the flats reminding me more of a breath of wind over a field of corn than anything else. While the centre of this disturbance was undoubtedly Wellington, it was also severely felt as far north as Taranaki and at Cloudy Bay

and Nelson, across the straits. The damage done in Wellington was considerable, where it either damaged or destroyed all the brick buildings in the town to the number of sixty, only some four coming through unscathed. The Colonial and Native Hospital, and the Gaol, were practically destroyed, the patients and inmates were quickly removed and given accommodation at Government House by Mr. Eyre. Chimneys were everywhere thrown down, but a few which were constructed of English-made bricks and cement withstood the convulsions.

The new military barracks at Paremata was so damaged it was vacated, the soldiers in the meantime occupying whare. The ruins of this old "fort" are still visible to the left hand side as the train passes over the Paremata railway bridge on its way to Plimmerton. Unfortunately this particular shake in the afternoon was accompanied by the loss of three lives: Barrack Sergeant James Lovell, with his two children was standing at the foot of a high brick wall surrounding the stockade on Te Aro beach and were thrown down, the wall collapsing at the same time, burying them in its ruins and when extricated one of the children was already dead, the father and the other child succumbing shortly after. Needless to say the inhabitants were more than alarmed, many of them rushed to the boats in the harbour, demanding to be taken away from the scene of the disaster. At this Mr. Eyre, the Lieutenant Governor, set an embargo on all ships to remain in port; the commander of HMS Fly being instructed to see none left, as it was the intention of the Lieut. Governor that they should be appointed places of refuge should worse happen. All the Government specie was removed to the warship until the elements appeared more settled. Many fires had broken out in the demolished buildings and in others where fire-places had collapsed, the town was only saved from a conflagration by the residents having sufficient presence of mind to go around the deserted and ruined tenements extinguishing the incipient flames.

At this time myself and family were fortunate in living in a wooden building on Wellington Terrace belonging to Mr. Hickson of Ridgway, Hickson & Co. where our brick chimney was thrown down and all our household earthen and glassware were violently dashed from their places and smashed to pieces. We afterwards removed into an adjoining building nearer to Captain Sharp's and lately occupied by his friend, Captain Francis Robinson.

October 18th At five a.m. a severe shock occurred, followed at eight a.m. by another and from now until the end of the month shocks were felt daily, many buildings which had previously been damaged were now destroyed. On the 19th at five a.m. a shock quite as severe as any of the preceding ones shook the settlement, and while it created the greatest consternation no further loss of life occurred. During these alarming experiences the weather was very inclement, but notwithstanding this large numbers of people lived outside in the open, while many of them took refuge in the bush clad hills. At the Hutt the bridge was severely strained by the earthquakes followed by a flood in the river following, the structure suffering severe damage, so much so that after the disturbances ceased its reconstruction was taken in hand.

November 26th *HMS Havannah*, 18 guns, Captain Erskine, arrives from Sydney via Auckland bringing Captain Grey, the Governor in Chief and the Rangitira Te Puni. It

appeared that the Lieutenant Governor, Mr. Eyre, on the 19th and 21st October had transmitted to Auckland dispatches of the most alarming nature concerning the awful effects of the earthquake, that His Excellency took the first opportunity to visit this place. He proceeded through the whole Settlement on foot and was gratified to find that the losses sustained would fall greatly short of the estimate that had been forwarded to him. The citizens of Auckland had collected over 500 Pounds in cash, headed by a donation of 100 Pounds from Bishop Selwyn, for the relief of the local sufferers, but at a meeting held later in Wellington it was unanimously [decided] to thank them heartily for their kindness promoting the gift, but that the settlers could not see their way to accept and begged to be allowed to return it coupled with the warmest thanks.

A local committee was formed with the Rev. Robert Cole as Chairman to give relief to any settler who was so circumstanced through the catastrophe that assistance was urgently required. Apart from this the townspeople exhibited entire self reliance and a determination to belie the report of Mr. Eyre that "a blow had been struck at its prosperity from which it will not readily recover." The total damage done was estimated at 15,000 pounds, of which nearly one-third was Government property.

Taki, Rihara

Source: Taki, R. (18480: Letter to William Colenso, dated 20th October, 1848, from Rihara Taki. Original in Mitchell Library, Sydney, NSW, Australia. This extract has been translated and kindly made available by Tahu Kukutai – Research Scholar for Te Rau Kahikatea, St. John's College, Meadowbank, Auckland.

Location: Turanganui, Wairarapa

Keywords: primary, fire, aftershocks, ground damage

Oketopa 20, 1848

Kia te Koroneho.

E Ta,

E Ta, tenei tetahi mea. kua kitea he ahi. Na nga Pakeha i kite, na Parani raua ko Hohepa Kere. Ko nga wahine tokorua, ko nga hepara tokowa na ratou i kite e ka ana i te taha o te toahi kau. E ka ana ka haere atu nga wahine ki te taha. Ka riria e nga tane, kei mate.

Ko taua ahi, no te tekau ma iwa o nga ra o Oketopa. No reira i ka ai na te ru. He nui te pawa. Ko te pa o Tama-i-hikoia Wahi-iti, ka wakamomia katoatia. Tutu ana te puehu o raro i te kawenga ake a te ru. Wati ana nga tangata o taua pa ki waho ana pouaka, ana mea katoa.

Ka nui te mate o nga tangata o Turanganui. Pau katoa nga kai i te wai - haere katoa i te waipuke."

[Translation]

To Colenso,

Sir, here is something: a fire has been discovered. It was seen by some Pakeha, Parani and Hohepa Kere[*]. Two women and four shepherds saw it burning beside the ?cow stall [**].

As it was burning, the women went to its edge. They were scolded by the men, for fear of them dying.

That fire [occurred] on the 19th of October. It was caused by an earthquake. There was a lot of smoke. As for the fortified village of Tama-i-hikoia [at?] Wahi-iti, it was completely swallowed up. There was a great disturbance due to the strength of the earthquake. The people of that village fled outside [with] their boxes and everything else.

The people of Turanganui suffered a great deal. Food was completely destroyed by water – all gone in a flood...

Notes:

*Joseph Kelly (see also Horomona Pa extract). It is not known who Parani is, but it may be the name of Kelly's Maori wife.

** The Maori words are toahi kau. They have no known meaning in Maori and it is thought that they may be a transliteration of cow stall?

This extract refers to the third large shock in the 1848 earthquake sequence, at 5 a.m. on Thursday 19th October. Rihara Taki was a native teacher at Te Kopi on the eastern side of Palliser Bay. Joseph Kelly's house was situated on a terrace on the north side of the Turanganui River. The fortified village of Tami-i-hikoia (a leading Wairarapa chief) was at Te Waitapu (situated near the house of Angus McMaster at Tuhitarata and close to the Ruamahanga River). As with the Horomona Pa extract, the fire probably refers to the spontaneous ignition of methane released by the earthquake that ignited vegetation.

Reference to the flooding is interesting. Charles Bannister (*Early History of the Wairarapa*. 1940. Masterton Printing Co., Masterton) records information from Hamua Paora (Paul Hamua) who refers to a very large flood caused by an earthquake-induced landslide damming the Ruamahanga River at Kopuaranga. The wall of water was described as eight feet high after it broke through the landslip and was the biggest flood known at the time. The flood was supposed to have occurred prior to Richard Collins arrival at Te Ore Ore in 1849-50. Other evidence suggests that this landslide took place as a result of the 1855 M8+ Wairarapa earthquake, although no first hand observations of the landslide were recorded in descriptive accounts at the time.

The Richard Taylor extract (q.v.) also refers to the shaking down of a "large portion of the lofty mountain at the back of Hikurangi" specifically as a result of the October 19 earthquake. The location is not known, but may have been near Wanganui, the centre of Taylor's missionary activities.

It should be noted also that a large amount of rain fell in Wellington and hence probably, the Cook Strait area, for a few days prior to the first earthquake on October 16. It was still showery on that day, followed by high winds for the next three days (Eiby, G. A. (1980): The Marlborough earthquakes of 1848. DSIR Bulletin, DSIR, Wellington).

Taylor, Mary

Source: Taylor, M. (1849): Letter from Mary Taylor to Ellen Nussey, 9 February 1849. Ms. in Berg Collection, New York Public Library. *In:* Stevens, J. (ed.) (1972): Mary Taylor, Friend of Charlotte Bronte: Letters from New Zealand and Elsewhere. Auckland University Press; Oxford University Press.

Location: Wellington

Keywords: primary, mainshock, aftershocks, response/recovery, building damage

[At Wellington]
... Lots of earthquakes – till they are quite common place. This is small inducement but what do you think of our sending back a subscription raised in Auckland for us because we actually had no destitute to give it to. Aren't we thriving? ...

Waring [Taylor] is going to build a new house. As the chimneys of the present one were entirely shaken down by the earthquake it is just ready for moving back ... Two fiths [sic] if not half the houses in Wellington were shaken down by the earthquake and the town is vastly improved in consequence. Almost every body is building. We think nothing of what we have lost because no one was ruined. At least only one man whose house was entirely destroyed. He was a Doctor[*] who got such a fright he resolved to go to Sydney. The vessel[**] he was in was wrecked just outside Wellington harbour and he brought his family back again to Wellington having lost everything on the wreck. Fortunately a box was picked up with his money in and took passage for Sydney as soon as possible. He is now on his way to England.

Notes:

*James Hansard. He lived in a two-storied brick house in Manners Street that was completely shattered by the earthquakes. It had to be taken down (see Hickson extract).

** The barque *Subraon*

A sum of £500 raised by clergy and citizens of Auckland was sent to Wellington on the 30th November 1848 with more being promised. At a public meeting on the same date, Wellington citizens expressed their appreciation but voted that the money be returned with 'warmest thanks' because Aucklanders had been 'under an exaggerated impression of the losses' sustained in Wellington by the earthquakes (see *New Zealand Spectator* November 29; December 2, extracts).

Waring Taylor lived in Herbert Street (east side), off Manners and Dixon streets, Te Aro.

A letter dated 10th April, 1849 to Charlotte Bronte by Mary Taylor states that she had written an account of the earthquakes for *Chambers Edinburgh Journal*. However, this was not published, possibly because an editorial compilation from an article by Judge H. S. Chapman published in the *Westminster Review* for July 1849 (see extract) was printed instead on 22 September 1849 (see extract).

Taylor, Rev. Richard.
Source: Taylor, R. (1848): Journal Vol 5 12 Mar 1847-31 Dec 1848. qMS-1989, Alexander Turnbull Library, NLNZ
Location: Wanganui, Ohau, Waikanae, Kapiti
Keywords: primary, mainshock, aftershocks, building damage, ground damage

p.262
16 [October].
[At Wanganui]
About two o'clock in the morning we awoke by an earthquake, it commenced very gently and without the usual rumbling sound and gradually increased until at last the motion was very violent, the vibratory movement continued for some time, it commenced as usual from W. to

E. but afterwards it seemed to come from all the points of the compass at the same time; the principal shock lasted nearly four minutes but the trembling of the earth continued at least an hour. I fully expected that our chimneys would have fallen ... but they stood so well that there was not the slightest crack visible in them. It made us all feel very sick and gave us headaches. We perceived a very disagreeable smell after the principal shock ... the only tokens of the fearful shakings of the night which were visible were the spilling of the water and milk vessels a medicine bottle or two and the shaking down of a few bricks and plaster in the church.

p. 264
October 17 We have had several shocks to-day one was rather a smart one.

October 19 This morning about five we had another very severe shock though neither so violent or of so long continuance as the one on the 16th.... We had another smaller one at ten. We had several more in the course of the day.

p. 266
October 25 We have just heard that the earthquake on the morning of the 19 inst. had shaken down a large portion of the lofty mountain at the back of Hikurangi. The pa had a very narrow and providential escape of being overwhelmed with all its inhabitants, as it was, several of their cultivations are deeply buried with the debris of the mountain. At Hoperiki also the shock caused a fall of the mountain at the back of the pa which nearly overwhelmed Haimona the teacher who had only just time to snatch up part of his garments and flee for his life, the remainder were covered up by the fallen mass.

p. 270
Haimona ... said he was sleeping under a large Rata tree but he heard it break as it waved to and fro with the shock; he had only just time to get away before it fell. I noticed a great many recent landslips though none were of any great size.

p. 291
A Frenchman ... told me that during the late earthquakes more than a dozen circular holes made their appearance on the beach in that vicinity; each was about a yard wide and more than 14 feet deep. They were filled with sand and water and raised above the level of the surface. A man fell into one up to his middle and had some difficulty in getting out again.

We lunched with Major Durie at Waikanae, who walked with us to see some cracks formed by the earthquakes, they run N. and S. and are about six inches wide; there were also circular holes in this place from which large quantities of gas escaped. About 2 miles from Waikanae a large fissure of near 8 inches width opened on the side of a hill.

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Source: Taylor, R. (1848): Copy of Letter from Wanganui dated Nov. 18, 1848. *In:* Taylor family notebook No. 14. 1844-1873. MSX-5570, Alexander Turnbull Library, NLNZ
Location: Wanganui, Wellington
Keywords: primary, mainshock, uplift/subsidence, ground damage, atmospheric effects

[At Wanganui]
My dear Sir,
The earthquakes, though very violent at Wanganui, were apparently less so than at Wellington as none of our chimneys were thrown down, or any of the buildings injured; and it is remarkable that, although my chimnies are about thirty feet high, and rocked to and fro in a very violent manner, there is not even a trace of a crack in the plaster to mark the shaking they have had.

There are, however, several curious facts connected with these earthquakes, which prove that there is a gradual upheavement going on, and that this is in proportion to the strength of the shock.

On the north side of the bluff, near the mouth of the Wanganui, a rock was thrust up in the deepest part of the channel, which is now eighteen inches above the low water mark. A shoal has arisen where there was a depth of six feet, and a long spit of land extends from Waipuna to Wilson's Ditch where, formally, there was deep water. The gun-boat wharf also has either sunk, or the land near it has risen: the latter appears most probable, as the town appears to be more visible from my house, which is on the opposite side of the river, than it was formerly. There is a row of posts near the gun wharf, which have been removed outwards full three feet, and several fissures in the river were noticed in that locality, after the shocks, which have since been filled up. The Beacons also at the Heads are now observed to be much out of the perpendicular, and inclining contrary ways. A large log used at a landing place opposite Churton's house has removed several yards from its ancient bed, where it has laid ever since I can recollect the place, and is now lying at a distance of several yards further up the stream. In a recent visit up the river, I noticed a great number of landslips, but none of any great size. The teacher of Hoperiki has a very narrow escape of being killed by the earthquake. On the Thursday morning the 19th he was sleeping under a large rata tree. When the shock commenced, he felt the tree waving about, and instantly jumped up, and escaped only just in time to clear the falling tree which buried his clothes in the ground.

I have noticed that all our shocks come from the N.W. and, I am persuaded, they radiate from some centre seated in the sea. The courses of rivers are evidently fissures formed in the upheavement of the land, and the shocks are chiefly felt in their vicinity; frequently they are not perceived a little distance on one side or the other. The entire course of the Wanganui is a series of these upheavements. Every little stream which falls into it being a lateral fissure, marking the extent of the upheavement, the ?one?? end of the strata raised being as much elevated as the other is depressed: the part lifted up being invariably opposite to the point from whence our shocks appear to proceed.

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At Wanganui seldom a longer period than a month elapses without a shock; but these are not often serious. The severe one appears to visit this part of the Island periodically every five years, and seem to be proceeding from the North to the South. Ten years ago, Kawia? [Kawhia?] and Mohau [?Mokau?] severely suffered; One person was jerked out of his bed, and another who was sitting down to dinner had it suddenly swept away from him. But the Natives describe a former visitation as having been very alarming, the ground opening in many places and swallowing up trees. At Taranaki it shook down a cliff and overwhelmed a large party of Natives who were passing along at the time. A series of severe shocks were felt in the vicinity of Wanganui, nearly all the chimnies fell, the church at Putiki was partly thrown down, the earth opened in fearful rents parallel to the river which was deepened in several places and noxious gases escaped in large quantities, which I have no doubt caused the sickness which afterwards prevailed in the place. At Rangitikei also the earth opened. A large cliff there fell, and overwhelmed a house with its unfortunate inmates. I have omitted to say that after the principal shock on Monday morning we also perceived a disagreeable smell as though of pie.

I have generally noticed that earthquakes are preceded by gales, and it has struck me that the state of the atmospheric pressure on the earth has something to do with them. When we reflect that, in all probability, the solid crust of our globe is not thicker in proportion to its size, than the skin of an inflated bladder, atmospheric pressure must have much to do in prede??? the angularity of our surface, and any cause affecting it must correspondingly affect the earth it presses upon although there are other agents at work by which also these fearful phenomena are occasioned.

I have no doubt we shall hear that these shocks have been very violent in the Middle Island as well; perhaps more so than Wellington.

When we heard of the destruction of Wellington, I thought it right to appoint a day for public thanksgiving, and it is ...? remarkable I selected unknowingly the same day which was appointed to be kept as a fast at Wellington. I am happy to say we had a very good congregation.

I must not omit to say how deeply we felt for you all, and what satisfaction it afforded us to hear you had suffered comparatively little loss. There is no evil which is not attended with some good, and this visitation will no doubt compel the inhabitants to build more substantially than they have hitherto done. Clay walls, if <u>well</u> built, having no wood in them, will stand very severe shocks; those so built did not suffer from our former severe shocks.

Notes:

This letter, presumably written by the Reverend Richard Taylor to an acquaintance in Wellington, was, along with many others, a copy made by his wife. Parts are very similar to the article published in the *New Zealand Spectator and Cooks Strait Guardian* of December 6, 1848.

Source: Taylor, R. (1855): *Te Ika A Maui or New Zealand and its Inhabitants*. Wertheim and MacIntosh, London.
Location: Wanganui, Wellington
Keywords: primary/reminiscence, secondary, mainshock, aftershocks, building damage, ground damage, uplift/subsidence

The next alarming one [earthquake] took place about two o'clock on Monday morning, October 16th, 1848, when a series of heavy shocks were felt. This last visitation established one interesting fact, that the disturbing cause is not stationary: the quarter from which it proceeded had shifted since the year 1843 from W.N.W. to W.S.W.: it afterwards, however, returned to its former quarter. The shocks appeared to commence gradually, and were preceded by the usual loud rumble; the principal one lasted full four minutes. The movement was very violent, and although the motion seemed to come from the west, the same as in all the preceding ones, still it was more from the south than usual, and there was also a lateral vibration noticed in this as well. The shocks lasted nearly an hour. At Wanganui they cracked some chimneys, injured the baker's oven, and shook down a few bricks and some plaster in the church; but, with those expectations, they did little injury there. This earthquake was followed by a disagreeable smell, and headaches were quite general. After these shocks large quantities of bitumen or asphaltum were washed up on the coast: some pieces of a considerable weight. At Ohau, much gas was ejected from circular openings. But the grand centre of action was at Wellington, where most of the houses were more or less injured: indeed, there was scarcely a brick buildings left standing, or a single chimney which was not thrown down. Several fissures were formed, and the land was raised so much that the small craft which were accustomed to anchor close in shore, were obliged to change their ground.

Notes:

Taylor arrived in New Zealand in 1839. His mention of the land being raised near Wellington is one of only two references to uplift during the 1848 earthquakes (the other is by the Reverend Ironside). It does not appear to a confusion with uplift that occurred during the 1855 earthquake. After his account of the 1848 earthquakes, he goes on to describe the 1855 earthquake: "At Wellington [in 1855], the harbour is stated to have been raised full four feet and a half, and similar changes to have taken place in every part of the district". He continues, "In fact, the raising of sea-beaches is a very common occurrence, and in every part of the island [North Island] numerous instances are to be seen, several of which have occurred during my residence".

Thomson, A.S.
Source: Thomson, A. S. 1859. *The Story of New Zealand*. Vol. II. John Murray, London 368 pp.
Location: Wellington, Wairau Valley, Porirua, Wanganui, Nelson, Hawke's Bay, Canterbury, Otago, New Plymouth
Keywords: secondary, building damage, casualty, faulting, mainshock, aftershocks, response/recovery, ground damage

p.170.
On the 17th of October ... every wooden house in the town [Wellington] was rocked to and fro, all the stone and brick buildings were injured, and barrack-sergeant Lovell and his two children were killed. On the 16th and 19th there were also grand shocks, followed by minor vibrations. Settlers expected the earth to open; some slept in the bush, and all were panic-stricken; business was suspended, a solemn fast was ordered, and the churches were filled with penitent sinners. Men thought Wellington was ruined for ever. The Lieutenant-Governor laid an embargo on the ships in the harbour; one bark stole out with sixty-six colonists, but the vessel, as if to punish the law-breakers on board, was shipwrecked, and her passengers were thrown back on the shattered settlement. Chimneys left standing were taken down. During the earthquake rumbling noises were heard, hurricanes of wind and rain preceded the shocks, and sulphurous gas escaped from the ground.

These earthquakes had for their centre the Wairau valley, at which place a fissure opened; and masses of rock, detached from the sides and summits of mountains, rolled with thundering crashes into the neighbouring valleys. At Nelson the shocks were less severe than at Wellington; at Porirua and Wanganui they injured the stone barrack; at New Plymouth they were severe, but did not damage; at Kawhia one shock was felt; at Auckland the shock was not felt ... On the west [sic] coast the shock was felt at Hawke's Bay, slightly at Akaroa, but not at Otago. The earthquake was therefore confined to a space of upwards of three hundred miles, or between Bank's Peninsula and White Island. Masses of bitumen were washed on shore along the west coast of the North Island after the earthquake. At Wellington property was destroyed to the amount of £14,000. After the earth had settled, it was ascertained that these phenomena were common in Cook's Strait and that the present shock was a severe one.

Tiffen, F. J.
Source: Tiffen, F. J. (18??): Diary, MS-Copy-Micro-0570, Alexander Turnbull Library, NLNZ
Location: Wellington, Wairarapa
Keywords: primary/reminiscence, mainshock, aftershocks, building damage, casualty, ground damage

[At Ahiaruhe, Wairarapa]
1848 Oct 16 to 19. Four days of Earthquakes not such as people make a song about now-a-days but real chimney-leveling, earth-cracking terror inspiring articles. A disastrous one at 1.40 a.m. on 16th smaller and numerous for the next 2 days, and a very big shake at 5 a.m. on the 19th. Brick chimneys in the country were scarce articles and our houses could stand a good shaking but in Wellington there was a general picnicking and outdoor cooking going on for want of chimneys. Only 1 baker's oven was left intact and the owner held the military contract to supply the troops. A brick wall fell and killed Sergt. Lovel and 2 children. Medical Hall kept by Dr Dorset became a scene to be imagined with bare shelves, and the contents broken and badly mixed. A number of residents of Wellington embarked on a vessel [*] on

the eve of sailing to Australia. The vessel got wrecked before clearing the heads and all were glad to get to their old homes again. A number of land slips occurred on the wooded hills between Wellington and Wairarapa and in one instance a house was shaken off the piles supporting it.

* the *Subraon*.

Turnbull, T.

Source: Turnbull, T. (1888): On earthquakes and architecture. *Transactions and Proceedings of the New Zealand Institute* 21, 498-502. [A reply to a paper given by W. M. Maskell (President of the New Zealand Institute) at a previous meeting].

Location: Wellington

Keywords: secondary, building damage, background, response/recovery

p.499.

The earthquake of 1848 was of a much more severe character than the one in 1840, and many brick buildings in the city were shattered. Mr. Fitzherbert's free and bonded store in Farish Street collapsed, but was subsequently restored by Mr. Plimmer without taking off a slate. The front wall of the Colonial Hospital, in Pipitea Street, was partly thrown out. A new brick building on Mount Cook had to be stopped in consequence of the shake. Hickson's store, which was also damaged, is still standing at the corner of old Customhouse and Cornish Streets. The Wesleyan Church, in Manners Street, was also thrown down. These were all the brick buildings injured. It was worthy of note that no wooden buildings were injured. The brick buildings were built then of a mortar composed of shell-lime and clay from Barrett's Point, which with age was reduced to a powder. Old intelligent pioneers assured him (i.e. Turnbull) that, if the buildings had been constructed then as they are now, little or no damage would have been done. A sensational report of this earthquake was drawn up by Mr. Eyre, Lieutenant-Governor, which had a most alarming effect, and greatly retarded colonisation for a long time.

p.501.

Mr. Donaldson asked the author whether the wooden buildings stood the shakes experienced in 1848 and 1855 better then those of brick and stone.

He quoted some notes on the shock of 1848, written by Mr. W. Fitzherbert, who stated that "the earth in some parts was moved in waves averaging about 12in. in height". He would like to know how their brick buildings would fare under those circumstances. Mr. Fitzherbert had further stated that in the brick buildings which were thrown down the mortar used seemed to make very little difference. In many cases it was bad: but where good cement had been used the only difference noted was that the bricks instead of falling singly, came down in blocks of eight or ten together. This would probably not be much more satisfactory to the inmates than a rain of single bricks. Mr. Maskell also quoted from some notes on the same earthquake

given by Mr. H. S. Chapman (afterwards Judge Chapman), in an article in the *Westminster Review*, detailing the damage done. In this article Mr. Chapman expressed the view that brick buildings in Wellington might be safe enough if of one storey only, or well tied together by bonding-timbers, but not otherwise.

Further, as a proof that men of eminence did not think the earthquake of 1848 a light matter, and considered great precautions necessary for the future, he quoted from a letter written in 1888 to the Institute of British Architects by Mr. E. Roberts[*], who was attached to the Royal Engineers in Wellington in 1848. Mr. Roberts after that built a new goal on Mount Cook, and took a precaution of constructing it with specially large bricks built in a perfect cage of iron bars placed 5ft. apart, and running up from the foundation to the roof. This gaol is of no great height.

Mr. Turnbull ... explained that the Roman cement referred to was not equal to our present cement. He could not say much as to how wooden buildings had stood during the severe shocks.

Notes:

*The British Institute of Architects does not have a record of the letter written by E. Roberts in 1888, possibly the same E. Roberts who was one of Sir Charles Lyell's informants concerning the 1855 earthquake. Although appointed as one of the commissioners to report on the damage caused in Wellington by this earthquake, he was unable to carry out this duty as he returned to England in May, 1855. His account of the effects of the 1855 earthquake appeared as an Appendix in the Rev. R. Taylor's book "Te Ika a Maui" published in 1855 (see Rev. R. Taylor extracts).

Vennell, S.

Source: Vennell, S. 18?? Letter from Mr. S. Vennell, Tauherenikau, Wairarapa. *In*: Hector, J. (1891): Report of the Committee appointed to investigate and report upon seismological phenomena in Australasia. *Australasian Association for the Advancement of Science* 3, 505-532.

Location: Wellington

Keywords: primary/reminiscence, mainshock, aftershocks, casualty, building damage

"... in 1848: three sharp shocks occurred, one on Sunday [actually Monday] morning early, one on Tuesday, and one on Thursday, throwing down houses and chimneys, and a brick wall, killing three persons - a father and two children. I myself picked up the youngest, of course quite dead.

Notes:

Vennell refers to the two strongest aftershocks on Tuesday October 17 and Thursday 19 that followed the main shock early on Monday 16 (mistakenly given by Vennell as "Sunday morning early"). The casualties refer to Barrack Sergeant Lovell and his two children, a girl who was killed outright and a boy who, like his father, later died of injuries.

Ward, Joseph

Source: Ward, J. (1848): Diaries 1845-1849 and Logbook No. 5, MS-2233-2234 Alexander Turnbull Library, NLNZ

Location: Nelson

Keywords: primary, mainshock, aftershocks

[At Nelson]

16th. Monday Heavy shock of earthquake in night of Monday morning 1/2 past ?two.

19th. Thursday Several shocks of earthquake have from time to time been felt again this morning. None so heavy as on Sunday night.

30th. Monday Two slight shocks of earthquake again this evening.

Watkin, James Entwhistle.

Source: Watkin, J. E. 1848. Daily reports of 1848 earthquakes. Micro-MS-0885-3. Alexander Turnbull Library, NLNZ

Location: Wellington

Keywords: primary, mainshock, aftershocks, casualty, building damage, atmospheric effects, response/recovery

[October 1848]

[At Wellington]

At 20 min to 2 o'clock on Monday morning Oct. 16 1848, we had the 1st shock of earthquake. It continued all night. Between 30 and 40 shocks during the day a few slight ones were felt. The day was showery. A few slight shocks in the night.

Tuesday 17th. A few slight tremblings in the morning. About 40 minutes past 3 in the afternoon we had our second heavy shock. Sergeant Lovel and his 2 children met their death by the walls in Farish St falling upon them. Slight shocks all night; we went to Mr Ironsides in the evening.

19th. Wednesday ... a few slight shocks during the day.

On Thursday morning [at] five o'clock we had our 3rd heavy shock. The chapel, Rhodes stores, Meurs, Ridgeways, Hicksons store and also Gov. store came down. End walls of the gaol destroyed, boundary walls rent from top to bottom. ?Walls. Hospital, broken and partly thrown down. The night a red glow was observed in the south, lasted from 1/2 p [past] 8 to 12 o'clock observed by Capt Crow. *Clara* between 4 and 5 Wednesday morning. Went up upon the hills by Mr. Tankersly's upland farm at night. Showery.

20th. Friday was observed as a day of fast and prayer. Services were held, Scotch Church, C. of Eng. R. C. and others. It was a beautiful day. During the day and night 13 shocks were felt. "Blundell" ?arrived? "Otago".

21. Saturday was a fine day. A few slight shocks were felt.

22nd. Sunday. A few shocks were felt, the strongest at 20 m. to 12. night. Mr. Ironside preached on board the "Subraon". Mills. London from service was held at the Scotch Church. It was a fine day.

23rd. Monday was a fine day. A few shocks were felt, strongest at 11 m. 10. night.

24th. Tuesday was a fine day. Two shocks in the night, in the afternoon, 6m. p. 2. Severe shocks occurred within the space of 3m. Second was severe. Slight ones during the afternoon and night.

25th. Wednesday. A few slight shocks nearly every 10 minutes.

26th. Thursday. A fine day. A few shocks afternoon. The barque "Subraon" was lost going out.

27th. Friday. Same. Very warm. Went out to the heads to see wreck "Subraon". Felt several shocks out there. And some when we came back.

28. Saturday was a fine day. A few shocks.

29. Sunday was a fine day. A few shocks. Had service Scotch Church.

30. Monday was the same.

31. Tuesday. Raining. 7.30. P.M. severe shock.
[November 1848]
1. Wednesday " "

2. Thursday was a cloudy, cold day, the wind blowing hard from the north.

3. Friday was a fine day, Some very smart shocks night and day.

4. Saturday Nov 4 was a very hot day. Afternoon cloudy. Wind from the northwest. In the evening drizzling rain.

5. Sunday. Was a beautiful day. Very warm. Heavy thunder storm from 7 to 1/2p 9. I had service at the Kirk.

6. Monday was wet in the morning. Towards afternoon it cleared up. A few slight shocks.

7. Tuesday. Was a fine day. A few shocks during the day.

8. Wednesday. Was a fine day. A few shocks.

9. Thursday. Was a fine day. Few shocks.

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10. Friday " " " "

11. Saturday " " " "

12. Sunday " " " " " Our school house was opened this day.

13. Monday. Was a very wet day. Commenced 10 in the morning and continued all night. A few shocks going to Hutt … got wet.

14. Tuesday. Was a fine day. A few rumblings ?...? upstairs W. North.

15. Wednesday. Was a fine day. A few shocks and rumblings. Wind north-west.

16. Thursday. Was a beautiful day. Some shocks during the night and one at 7 o.c., in the morning. At about 20m to 4 in afternoon we had a very sharp shock. At 12 o'clock at night we had a very sharp shock. Wind Nwest ?slept, down.

17. Friday. Gloomy all day. Very ...and sultry.

18. Saturday. Stormy dull day. Wind very high from north west. A few shocks during the day and night

[Only earthquake information is included in following extracts]

[November 1848]

19. Tuesday. Was wet. A few shocks during the day and night….
20. Monday … A few shocks….

21. Tuesday … A very shap shock just after 3 o'clock. A few during the night.

22. Wednesday … A few slight shocks in the day and night….

23. Thursday. A few shocks slight

24. Friday. Felt nothing up to 12 o'clock. A few rumblings in the night.

25. Saturday … A few shocks.

26. Sunday … felt nothing, some felt some….

27. Monday … some felt some shocks

28. Tuesday … some felt shocks. I heard a rumbling about 10 at night

29. Wednesday … felt nothing up to 2 o'clock, we had a very smart shock….

30. Thursday … several shocks were felt, some of them bumps up and down and several in the night….

[December 1848]
Dec 1st Friday ... a shock about ½ p 7 o'clock morning, several during the day and night slight....

Dec 2nd Saturday ... Several shocks I have heard, felt nothing myself....

Dec 3rd Sunday ... neither felt nor heard of any shocks

Dec 4th Monday ... a shock at 4pm, a rumble at 5pm several during the night

Dec 5th Tuesday ... several shocks during the morning, a very sharp one a few minutes past 8 am.... Felt nothing at night....

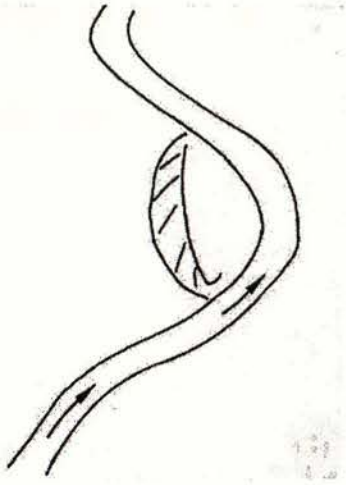
Weld, Frederich Aloyisius
Source: Weld, F. A. (1848): Memoranda and Memorabilia [Sir Frederick Weld, Accession W213] WELD W213, 4/1; 4/3, Archives New Zealand, Te Whare Tohu Tuhituhinga O Aotearoa, Wellington Office, NZ.
Location: Flaxbourne, Kaikoura, Marlborough, Awatere Valley, Wairau Valley
Keywords: primary, mainshock, ground damage, faulting, uplift/subsidence, background

October 16, 1848 Violent shock of earthquake felt at 29 m before 2 am this morning the men ran out of their house ... Heard afterwards that the earthquake had been felt more severely at the outstation ware it threw down our ware, Kemps ware [whare, Maori houseic] (Newcomes and Murphys house), Hon. C Dillons and also Mr. Goulands house were thrown down. A succession of minor shocks for two or three days. Large fissures were every where seen in the ground and one of them stretched right across the ware at the outstation.

November 2, 1848 Returned to station via Wairau. The earthquakes which are still frequent have done much injury in Pt. Nicholson.

In the Wairau the surface crust of dry land has in some places sunk 10ft. the water spouting up through diminutive craters from the swamp subsoil....

December 21, 1850 ... noticed the confluence of the Isis [Stream, with the Awatere River] ... encamped for our midday's bathe and rest by a spot where rugged rocks narrow the channel of the river ... about 1 1/2 miles from our midday resting place we remarked a very extraordinary earthquake fissure horseshoe shaped some 30ft wide by 12ft deep – thus – (see diagram) it appeared as if the neck of the land on which it was had – so to say, been shaken till one side bulged out leaving a fissure on the ridge – the bottom was covered with strips of sod which appeared to have sunk into the aperture – apparently not more than two years had elapsed since the chasm was made – the hill was yellow gravelly clay – there is no possibility of its having been formed by the action of water.



Weld's sketch of fissure near the confluence of the Isis Stream and Awatere River.

Notes:

Of the Marlborough inhabitants mentioned by Weld who had suffered earthquake damage, George Kemp managed the Starborough Run bordering Flaxbourne to the northwest for Major Richard Newcombe. He probably lived in a cob cottage called "Kempton" which he may have built himself. Following Flaxbourne, Richard Newcombe's run, Starborough, was the first to be taken up on the south side of the Awatere River. Although his depasturage licence was granted on January 1st 1849, he was clearly "squatting" prior to the 1848 earthquake, and probably since early 1848. By May of that year he had established a "station", i.e. "Newcombe Station", which was a cob cottage with a thatched roof. Mr. and Mrs. Daniel Murphy also lived in a cob cottage located near to where Richmond Brook joins the Awatere River, and beside the track which crossed the river at the Taylor Ford. He was a shepherd employed on Richmond Brook run. The Hon. Constantine Dillon (see earlier entry) and Henry Gouland (see earlier entry) both lived in the Wairau Valley.

The earthquake fissure was seen in December 1850 by Weld and Lovegrove in their exploratory journey up the Awatere River to discover and name Barefell Pass, and down the Guide River to its junction with the Acheron River. Reference to "great chasms" made by the 1848 earthquake in the vicinity of Upcot – Mt. Gladstone stations some 11km further up the Awatere Valley from the locality described by Weld was also made by Stephen Nicholls in 1851 (see Nicholls entry).

Background information on settlement in the Awatere Valley

The 'Wairau Purchase' between the New Zealand Company and the Ngati Toa people was signed on March 18, 1847. The large tract of land purchased included both the Wairau and Awatere valleys. After a survey by William Budge of the Wairau Plain into rural sections ("Wakefield Downs Block") the survey party moved into the Awatere at the end of 1847. 150 acre rural sections on both sides of the Awatere River were surveyed, 58 sections on the north side from the coast to present day Rossmore homestead; 97 sections on the south side from the sea to a point on the flat land two miles west of Richmond Brook stream. In March of 1848 the sections were allotted to people who had bought them in England seven years before. Because the great majority of owners were in England when "squatters" from Nelson began to run sheep on adjacent hills (being outside the surveyed lands and classed as 'waste land') the squatters bought the sections from the absentee landowners and added them to the area of their runs. The New Zealand Company, not expecting to have these pastoral lands at their disposal, began to issue 'depasturage licences' in the middle of 1848. These were first advertised in the Nelson *Examiner* in October 1848, as 'The Terms and Conditions for the Depasturage of stock on the Company's waste lands'. Early in 1848 a number of the Nelson gentry, anticipating the coming of depasturage regulations, began selecting "runs" in the Wairau and Awatere and moved surplus sheep from their overstocked Nelson land onto them. Applications for depasturage licences were made and the first of these was granted on January 1, 1849. This is how the term "squatter" originated, because prior to January 1, the Nelson gentry had no legal title to their Wairau runs. In 1848, these "squatters" consisted of:

Hon. Major Matthew Richmond, who employed William McRae to take up and stock a run for him on the south side of the Awatere River and extending SE across the Flaxbourne River to the Ure River - *Richmond Brook*, (see Saxton entry);

- William McRae, who took up *Blairich* for his father, George McRae. (By mid 1848 McRae had built a cob cottage of three rooms with a sleeping attic reached by an outside stairway);
- Captain Edward Fearon, who took up a run later called '*Marathon*' of 13,000 acres in the lower Awatere Valley;
- Major Richard Newcombe, who had a station '*Starborough*' established near present day Seddon, early in 1848; his run was managed by George Kemp who lived in a cob cottage - "Kempton";
- William Budge, '*Bluff*' run between the lower Wairau and lower Awatere;
- Dr. Thomas Renwick '*Dumgree*' in lower Awatere Valley;
- William Atkinson '*Burtergill*' in lower Awatere Valley;
- Dr. David Monro '*Bankhouse*' in Waihopi Valley,(see Saxton entry).
- Other possible residents were Mr. and Mrs William Brydon who lived in another cob house on the Dumgree flat, on the opposite side of the Awatere River to the Murphys.

Wilson, Peter
Source: Wilson, P. (1849): First Annual Report, Colonial Hospital of New Plymouth, Taranaki, N.Z.
Location: New Plymouth
Keywords: primary, mainshock, building damage

[At New Plymouth]
...of more than ordinary vibration.... Yet it was not in sufficient force to cause the slightest accident or injury to any building, though all our chimneys are of stone, earth, or brick, and there exists more than one infirm clay-built house, so ruinously tottering indeed as at least to disgrace the appearance of the town.

Withers, Edward
Source: Withers, E. (1901?): From a copy of a history 'Old New Zealand', written in 1901 by the daughter of Captain Withers. Supplied with permission to publish.
Location: Wellington
Keywords: secondary, response/recover, building damage, casualty, mainshock

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In or about the year 1847, Quartermaster Edward Withers (as he was then titled), was living in Wellington in a large house with a beautiful orchard at the foot or on the lower slopes of Mt Victoria...

The few sailing ships in harbour were rushed by panic stricken people, before this and fabulous sums offered for a passage from what was considered a doomed settlement. One

vessel arrived in Sydney and reported Wellington swallowed up. Another caught by the tidal wave was thrown ashore at the heads[*], the passengers having to walk back over wild country to Wellington. Wells went dry, a brick building, barrack thing, collapsed burying a sergeant and his 2 boys and some men[**], my husband heard the groans of the poor creatures from which they could not be rescued in time.

Notes:

Edward Withers was a quarter master of the 65th Regiment stationed in Wellington at the time of the earthquake. This account is rather garbled. The main part of the passage refers to the 1855 earthquake and there is clearly confusion between the 1848 and 1855 earthquakes.

* This was the "Subraon" that was wrecked on Barrett's Reef. Reference to the tidal wave refers to the 1855 earthquake.

** No others were buried beneath the brick wall other than Sergeant Lovell and his two children, a boy and a girl.

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