

1940

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH.

DOMINION OBSERVATORY, WELLINGTON, NEW ZEALAND.

NEW ZEALAND SEISMOLOGICAL REPORT.

PROVISIONAL BULLETIN NO. P 95 JANUARY 1940

The bulletin is divided into two parts:—

Part I gives the principal phases recorded from distant earthquakes (Wellington $\Delta > 10^\circ$ ca.). Where the clock correction is not known, the time of P (or first phase recorded) is enclosed in a bracket. Whenever they are definitely indicated, the trace amplitude and the direction of the vertical component of P are given. An upward ground movement is designated (+), and a downward movement (—).

Part II gives a summary of local earthquakes (Wellington $\Delta < 10^\circ$ ca.). The first table contains the principal earthquakes; while other less important shocks, recorded or reported felt, are referred to in supplementary lists.

A list of provisional epicentres in the South-west Pacific (outside the New Zealand region) is also given. These epicentres are determined from local records, together with the readings from as many overseas stations as are available.

LIST OF NEW ZEALAND SEISMOGRAPH STATIONS.

Station Name and Abbreviation.	Position.		Height above M.S.L.	Lithologic Foundation.	Seismographs.	Observers.
	Latitude.	Longitude.				
Wellington (W) ..	41° 17' S	174° 46' E	Feet. 401	Greywacke	Milne-Shaw (N-S) .. Galitzin-Wilip (Z) .. Wood-Andersons (N-S) and (E-W) Jones or Geophone (Z) .. Imamura (three components)	Dominion Observatory, Central Station. Acting-Director— R. C. Hayes. Observer— W. M. Jones.
Arapuni (A) ..	38° 5' S	175° 39' E	212	Rhyolite tuffs	Milne (E-W)	Powerhouse Superintendent.
Rotorua (R) ..	38° 8' S	176° 15' E	930	Rhyolitic silts and gravels	Jaggat (E-W)	District Engineer, P.W. Dept.
Tuai (TU)	38° 48' S	177° 9' E	960	Gravels	Wood-Anderson (N-S) ..	Mr. H. C. Scott, P.W. Dept.
New Plymouth (N) ..	39° 4' S	174° 4' E	112	Ash, agglomerate, and lava	Wood-Anderson (E-W) ..	Superintendent, the Prison.
Hastings (H) ..	39° 38' S	176° 53' E	35	Alluvial sands, silts, and gravels	Jaggat (NE-SW)	Mr. H. de Denne.
Bunnythorpe (B) ..	40° 17' S	175° 36' E	197	Gravels, sands, and silts	Jaggat (NW-SE)	Mr. W. A. Waters.
Takaka (TA)	40° 51' S	172° 48' E	25	Alluvial gravels	Imamura (three components)	The Postmaster.
Greymouth (G) ..	42° 25' S	171° 13' E	14	Deltaic sands and gravels	Jaggat (E-W)	District Engineer, P.W. Dept.
Christchurch (C) ..	43° 32' S	172° 37' E	25	Alluvial sands, silts, and gravels	Galitzin (three components) Wood-Anderson (N-S) ..	Magnetic Observatory. Director—H. F. Skey. Observer—H. F. Baird.
Monowai (M)	45° 47' S	167° 37' E	538	Tertiary sandstone ..	Jaggat (E-W)	Mr. A. Walker.
Chattham Islands (CH)	43° 57' S	176° 31' W	210	Volcanic breccia	Milne (E-W)	Superintendent, Radio Station.

Part I - Distant Earthquakes.

Date 1940	Station #	Phase	G.M.T. h. m. s.	Period sec.	Δ deg.	Remarks
Jan. 2	W	P	11 17 18		61ca.	Interpretation doubtful.
	C	S	25 37			
		P	11 04 27		91	
		SKS	14 48			
	A	S?	11 25.7			
4	C	P?	1 15 12			
		S	19 25			
	W	e	1 18 25			
		S?	20 05			
	A	i	1 18.0			
6	A	P	14 07.4		17.5	Provisional Epicentre near 21 S, ^{3/4} 170 E.
		S	10.6			
	N	P	14 07(30)		18.0	<i>169 H = 14 03.3</i>
		S	10 49			
	W	P	14 07 53		20.5	Az = -4mm.
		PP?	08 18			
		S	11 35			
		PcP?	43			
	C	P	14 08 13			Dilatation, az.N by W, Deep focus.
		i	37			
		S	12 11			Very large amplitudes, off sheet.
		iZ	35			
	CH	P	14(08.5)		24.5	
		S	12.8			
10	W	i	4 12 25			
	C	P	4 12 39		18.3	
		S	16 07			
11	C	P?	10 06 24		17.9?	
		S	09 48			
	W	L	10 11			
17	W	P	1 25 24		63	
		S	33 51			Prominent L-waves follow with max. at ln. 50m.ca.
	C	P	1 25 34		62.2	Dilatation.
		S	34 07			
	A	S	1 34.0			L-waves follow.
20	W	P	10 05 03		34	
		S	10 32			L-waves follow with max. at 10h.19m ca.
	C	P	10 05 22		30.7	
		S	10 32			
	CH	S	10 10.5			L-waves follow.
	A	S	10 10.9			Some L-waves follow.
21	TU	P	4 21 28		7ca.	Epicentre in vicinity of Kermedec Deep. Probably deep focus.
		S	22 48			
	N	P	4 21 49		9 ca.	
		S	23 34			
	W	P	4 22 00		11ca.	
		S	23 55			
	C	e	4 22 48			
		S	24 56			
	A	e	4 22 ca.			
24	C	P	1 35 31		26.4	
		S	40 09			
	W	L	1 42			
	A	e	1 39			
26	C	P	6 41 18		44.7	Compression. <i>06 41.7 155 167E</i>
		S?	48 00			
	W	P?	6 47 25		28?	Interpretation doubtful.
		S?	52 09			
	A	S?	6 51.5			
26	W	P	17 16 22		80ca.	Interpretation doubtful.
		S?	26.2			
	C	P	17 16 25		79.2	compression.
		S	26 28			
	A	S?	17 25.5			Prolonged tremors.

* See list of Stations on title page.

In addition minor activity was recorded as follows.

	d. h. m.	d. h. m.	d. h. m.	d. h. m.
<u>Wellington:</u>	(L) 1 02 00ca.	(L) 1 07 20ca.	1 12 21	(L) 6 18 33
	(L) 3 02 59	(L) 12 12 41	(L) 12 16 38	(L) 7 04 04
	17 01 54	(L) 17 13 23	17 22 49	9 13 53
	(L) 22 01 07	(L) 23 02 15	27 02 39	(L) 11 19 03
	28 12 55	(L) 29 14 09		
				d. h. m.
<u>Christchurch:</u>	1 12 18	3 02 55	(L) 6 09 00ca.	
	(L) 6 11 18ca.	6 18 24	9 06 53ca.	9 13 55ca.
	10 07 18ca.	(L) 11 18 06ca.	12 16 35ca.	
	22 00 15ca.	22 01 09	22 16 46ca.	
	23 02 18ca.	24 18 04ca.	(L) 29 14 07	
<u>Arapuni:</u>	9 13 52	17 22 49	22 01 06	
	23 02 14ca.	29 14 10ca.		
				d. h. m.
<u>Chatham Islands:</u>	Readings for 1939 December:	7 11 40ca. (Tremors)		
	21d. P= 21h. (10.0m.); S = 18.9m;	22d. SS?=5h (17m);		
		Lr = 33m.		

Part II - Local Earthquakes.

The Principal local shocks were as follows:

Date 1940	Origin Time G.M.T. h. m.	Provisional Epicentre		Stations recording shock	Remarks.
		Latitude	Longitude		
Jan. 4	13 06.4	Cook Strait Region		W	Felt Cape Jackson (slight)
6	18 19.4	41½ S	175 E	W,N,C	Felt about Cook Strait, max.R-F 4-5
7	09 34.8	40 S	175½ E	W,N	Felt Wanganui, R-F 4.
8	09 41.4	41¾ S	174 E	W,N	Felt about Cook Strait, max.R-F 3.
9	16 26.6	42 S	178 E	W,C	Slight shock felt Dunedin about 16h.30m.
11	12 35.4	40¼ S	173 E	W,N,C,H	Felt extensively from Hawera to Akaroa; max; R-F 5 at Wanganui and Blenheim.
19	16 03.2	South of Kermadecs		TU,N,W,C	
21	07 16.9	within 0.6° of Tuai		TU	Felt Wairoa.
22	17 32.1	between East Cape and Kermadecs		TU,N,W	
24	04 00.3	39 S	175½ E	TU,N,W	
24	04 01.2	39 S	175½ E	TU,N,W	
27	04 32.7	In Wanganui Bight		N;W	
27	07 16.9	"	"	N,W	

The number of additional small shocks recorded was as follows:

<u>Wellington</u>	-	16
<u>Tuai</u>	-	6 (No records till Jan.18 owing to broken suspension)
<u>Christchurch</u>	-	3
<u>New Plymouth</u>	-	5 (No records till Jan.5 owing to clock trouble)

The following Provisional Epicentres in the South-West Pacific (outside the N.Z. Region) have been determined, in continuation of the list given in Bulletin P - 93:

Origin Time 1939 d. h. m.	Provisional Epicentre		Remarks.
	Lat. (deg.)	Long. (deg.)	
Oct. 9 02 17.9	20 S	170 E	
17 06 22.1	15½ S	167½ E	Focal depth 125 km.ca.

DOMINION OBSERVATORY, WELLINGTON, NEW ZEALAND.

NEW ZEALAND SEISMOLOGICAL REPORT.

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Part II gives a summary of local earthquakes (Wellington $\Delta < 10^\circ$ ca.). The first table contains the principal earthquakes; while other less important shocks, recorded or reported felt, are referred to in supplementary lists.

A list of provisional epicentres in the South-west Pacific (outside the New Zealand region) is also given. These epicentres are determined from local records, together with the readings from as many overseas stations as are available.

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Arapuni (A) ..	38° 5' S	175° 39' E	212	Rhyolite tuffs ..	Milne (E-W)	Powerhouse Superintendent.
Rotorua (R) ..	38° 8' S	176° 15' E	930	Rhyolitic silts and gravels	Jaggar (E-W)	District Engineer, P.W. Dept.
Tuairua (TU) ..	38° 48' S	177° 9' E	960	Gravels	Wood-Anderson (N-S) ..	Mr. H. C. Scott, P.W. Dept.
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Hastings (H) ..	39° 38' S	176° 53' E	35	Alluvial sands, silts, and gravels	Jaggar (NE-SW)	Mr. H. de Denne.
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Chatham Islands (CH)	43° 57' S	176° 31' W	210	Volcanic breccia ..	Milne (E-W)	Superintendent, Radio Station.

Part I - Distant Earthquakes.

Date 1940	Station	Phase	G.M.T. h. m. s.	Period sec.	Δ deg.	Remarks.
Feb. 7	C	eP? SKS S	17 29 21 39 58 40 41			In microseisms.
	W	e	18 00			Records very disturbed by microseisms and high wind.
	A		18 02 ca.			Tremors.
12	TU	P	8 24 37		16½	<i>23S 177W D = 08 21.0</i>
	A	S e?	27 29 8 24.0 27.5			
	N	P	8 25 54		18	Provisional Epicentre near 23S, 177W. Focal depth 200 - 250 km. Sharp movement of large amplitude
	W	S P	29 03 8 25 08		19	
	C	S ScS sScS P	28 24 36 21 38 03 8 25 34			
	CH	S?	29 19 8 32			Compression, pulsations follow on N & E, deep. Pulsations follow impulse, largest on N. Records disturbed by changing paper.
20	A	P	2 23.6		23	<i>14S 167¼E D = 02 18.3</i>
	W	S P	27.7 2 24 00	28	26	
	C	S pP S sS	28 30 2 24 16 59 29 02 30 18		30	Prolonged L-waves of considerable amplitude follow. h = 200km+, az. NNW Large on N.
20	C	P	13 05 11		70.1?	Prolonged small waves follow. Records disturbed by microseisms. small movements.
	W	S L?	14 26 13 23			
	A	e	13 29			
24	A	S	12 15.6			Small compression from N.
	W	P	12 08 50		49	
	C	S P	15 53 12 08 58 16 04		48.5	
29	C	P' SKS Lq Lr L	16 50 25 57 50 17 27 50 36 30 17 27 g		142±	Sharp compression. Train of shallow waves follow. Prolonged small waves.

In addition, minor activity was recorded as follows.

	d. h. m.	(L)	d. h. m.	(L)	d. h. m.	(L)	d. h. m.	(L)	d. h. m.
<u>WELLINGTON:</u>	11 00 28+	(L)	11 06 19	(L)	12 00 15	(L)	12 10 05	(L)	14 02 37
	14 10 42		15 01 41		15 08 00		15 12 23		18 07 39
	18 13 33		20 20 42		23 05 03				
<u>CHRISTCHURCH:</u>	8 23 46ca	(L)	11 00 27	(L)	12 00 24	(L)	14 10 33	(L)	15 11 29ca.
	18 13 33ca.		20 20 49ca.	(L)	21 13 54ca.		23 05 04		
<u>ARAPUNI:</u>	11 00 25	(L)	12 00 42	(L)	14 02 40	(L)	14 10 43	(L)	20 20 42
	23 05 03								
<u>CHATHAM ISLANDS:</u>			20 20 44						

Part II - Local Earthquakes.

The principal local shocks were as follows:

Date	Origin Time G.M.T. h. m.	Provisional Epicentre		Stations Recording shock.	Remarks.
		Lat. (deg.)	Long. (deg.)		
Feb. 1	18 37.9	40 S	174½ E	W,N	
5	09 15.9	41½ S	173½ E	W,N,C	Felt Wellington, Nelson & Blenheim, max.
7	11 12.8	40 S	174½ E	W,N	Felt Wanganui, R-F 4? /R-F4
7	19 36.8	39.2 S	176.5 E	TU, N,W.	
7	20 42.2	40¼ S	174½ E	W,N	Felt Wanganui, R-F 3.
9	12 27.0	41½ S	172 E	W,C.	Felt Kanurangi Point, R-F 3.
13	02 52.1	North Canterbury		C, W.	Felt Rangiora & Christchurch, max. R-F 5?
13	03 04.9	"	"	C	Felt Christchurch (aftershock)
14	09 48.3	40.2 S	175.7 E	W,N,B	Felt Dannevirke, R-F 3-4, also Bunnyton
14	11 55.1	40¼ S	175¼ E	W,N	Felt Wanganui, R-F 3. /orpe
15	16 22.4	40¼ S	174½ E	W,N	Felt western parts of North Island south from Wanganui, max. R-F 4-5; also at Brothers Lighthouse, Cook Strait.
19	23 29.6	42 S	176 E	W,N,C	
23	03 32.5	40 S	175 E	W,N	Felt Wanganui, R-F 2.
24	03 30	West Canterbury		C	Felt Lake Coleridge, R-F 3.
26	06 16.6	39.5 S	176½ E	TU,W,H,C	Felt throughout Hawkes Bay with max. R-F 6+ at Hastings; also Tainape & Wanganui.

The number of additional small local shocks recorded was as follows:

<u>Wellington</u>	21	<u>New Plymouth</u>	7
<u>Tuairua</u>	13	<u>Christchurch</u>	7
		<u>Monowai</u>	1

Shocks not recorded on any instrument were reported felt as follows:

Puysegur Point	Jan. 31d. 11h. 08m.	R-F 5.
Nelson	Feb. 14d. 15h. 54m.	R-F 1

The following provisional epicentres in the South-West Pacific (outside the N.Z. Region) have been determined; in continuation of those given in the previous bulletin (P-95)

Origin Time 1939 c. h. m.	Provisional Epicentre		Remarks.
	Lat. (deg.)	Long. (deg.)	
Nov. 10 20 20.9	10 S	147½ E	Focal depth possibly 600 kms. ca.
10 16 49.7	53 S	160 E	
17 18 39.6	19½ S	180 E	
Dec. 18 10 31.3	5 S	152 E	

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DOMINION OBSERVATORY, WELLINGTON, NEW ZEALAND.

NEW ZEALAND SEISMOLOGICAL REPORT.

PROVISIONAL BULLETIN NO. P97 MARCH 1940

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Part 1 - Distant Earthquakes.

Date	Station	Phase	G.M.T. h. m. s.	Δ deg.	Remarks.
1940 Mar. 3	W	P S	00 10 55 15 30	26.5	Epicentre in vicinity of New Hebrides. Marked L-waves follow with max. ampl. at 00h.20mca.
	A	S	00 14.5		
14	C	P S	18 27 22 31 29	22.7	Compression from SW Large L-waves commenced 33m.32s. Coda lasted about 2 hours.
	W	P S	18 27 51 32 19	25.5	Az = -2mm. L-waves follow, with max. at 35m.
	CH A	S e	18 32.7 18 29		L-waves follow. Provisional Epicentre " " " near 60S, 145E.
18	TU	P S	05 41 00 42 27	7.7	Provisional Epicentre near 38S, 173W. v. small.
	N A	P? P? S	05 41 25 05 41.6 43.4	9.6?	
	W	P? S	05 41 40 43 36	10ca.	L-waves follow for nearly 1 hour. Shallow. Earlier phases not recognised.
	C	S e e	05 42 29 44 42		Pulsations. Larger 30-sec. period waves follow.
23	C	P? S Lq	08 19 40 24 00 25 05	24.1?	Compression.
	W A	L L?	08 25+ 08 21		
27	C	P SKS S SS i	12 44 51 55 10 55 49 13 01 53 02 29	90±	sharp on N (conspicuous). L-waves commence 9m.34s.
	W	SKS SKKS? S?	12 54 51 55 30 50	100ca.	Prolonged train of L-waves follows.
	A	SKS	12 55ca.		
28	W	P PP S ScS	16 00 10 03 10 09 28 10 03	75ca.	Az = +1mm. Focal depth possibly 100-200 km.
	C	P pP S sS	16 00 12 01 03 09 32 11 05	75	Compression from NNW, largest phase on Z Focal depth = 220km. ca. largest on N.
	A CH	S S	16 09.7 16 03		Prolonged tremors. Prolonged slight tremors.
29	C	P S	23 25 19 29 17	21.7	Compression.
	W	P S	23 25 36 30 00	25	
	A CH	S S	23 30ca. 23 33		in time gap. Tremor.
30	C	P? S	06 28 37 38 26	76.4?	
	W A	S? S	06 38ca. 06 50		Tremors probably L-waves.

In addition, minor activity was recorded as follows:

WELLINGTON: (L) 3 12 23 7 07 36+ (L) 13 19 32 (L) 13 22 13
 (L) 14 00 54 (L) 14 04 21 (L) 14 21 34 (L) 15 15 06+
 (L) 16 01 34 (L) 16 20 34 (L) 19 05 27 (L) 19 11 06
 (L) 20 00 09ca. (L) 21 14 20 (L) 22 20 29 (L) 23 22 43
 (L) 24 14 41 (L) 27 14 48 29 02 54 (L?) 31 17 38

	d. h. m.	d. h. m.	d. h. m.	d. h. m.
<u>CHRISTCHURCH:</u>	7 07 27	13 22 17ca.	14 00 57ca.	14 04 22ca.
	14 17 29ca.	15 01 01ca.	15 01 35	19 05 22ca.
	19 11 00ca.	(L)20 00 17ca.	21 14 15ca.	22 20 30ca.
	29 02 55	(L)30 12 04ca.	31 17 36ca.	
<u>ARAPUNI:</u>	7 07 33	13 22 12	16 01 32+ (L?)	21 14 27
	(L)22 20 27	23 22 39	29 02 53	31 17 37

Part II - Local Earthquakes.

The principal local shocks were as follows:

Date 1940	Origin Time G.M.T. h. m.	Provisional Epicentre		Stations record- ing shock.	Remarks.
		Lat.S (deg)	Long.E. (deg)		
Mar. 6	18 23+	48	165	M, C, W, CH, A.	
14	21 18.7	40	174½	N, W.	
17	11 36.5	38¾	176½	TU, H, N, W, C.	Felt Opotiki & Whakatane, R-F 3.
17	17 06.9	37¾	178½	TU, H, N, W, C.	" " " " " "
19	14 53.5	39	176½	TU (P = 14 53 41 ^S) N (P = 14 54 09) A (P = 14 54.0) W (P = 14 54 12) C (Pq? = 14 54 53)	Felt in eastern areas of North Island, as far south as Dannevirke with maximum R-F 7 in northern Hawkes Bay. Also felt in parts of Wanganui & Manawatu districts. A large number of small aftershocks were recorded at Tuai.
19	14 58.8	39	176½	H, B, CH. TU, H, N.	
19	15 31.5	39	176½	TU, H, N, W, C.	
19	17 06.6	39¼	177	TU, H, N, W, C.	Felt in parts of Hawkes Bay max. R-F 5 and at Whakatane.
20	07 43.5	within 0.5° of Tuai.		TU	Felt Whakatane, R-F 3.
23	05 22.6	Cook Strait region		W	Felt Paraparaumu.
27	02 40.0	39.8	174.4	N, W.	
28	16 03.0	Near Whakatane		TU	Felt Whakatane, R-F 5.
28	16 04.7	"	"	TU	" " R-F ?
28	16 09.3	"	"	TU	" " " "
28	20 10.5	"	"	TU	" " R-F 5) White Is-
28	20 46+	"	"	TU	" " R-F 3-5) land
28	22 44.7	"	"	TU	" " " ") reported
28	22 46+	"	"	TU	" " " ") active.
29	18 36	"	"	TU	" " , and Opotiki, R-F 4.

Following are the number of additional small shocks recorded at the various stations:

<u>WELLINGTON</u>	25
<u>TUAI</u>	78
<u>NEW PLYMOUTH</u>	12
<u>HASTINGS</u>	4
<u>CHRISTCHURCH</u>	2

A shock not recorded on any instrument, was reported felt as follows:

March 4d. 17h. 20m. ca. - Greymouth, R-F 1?; Hokitika, R-F 2.

DOMINION OBSERVATORY, WELLINGTON, NEW ZEALAND.

NEW ZEALAND SEISMOLOGICAL REPORT.

PROVISIONAL BULLETIN NO. P98 APRIL 1940

The bulletin is divided into two parts:—

Part I gives the principal phases recorded from distant earthquakes (Wellington $\Delta > 10^\circ$ ca.). Where the clock correction is not known, the time of P (or first phase recorded) is enclosed in a bracket. Whenever they are definitely indicated, the trace amplitude and the direction of the vertical component of P are given. An upward ground movement is designated (+), and a downward movement (—).

Part II gives a summary of local earthquakes (Wellington $\Delta < 10^\circ$ ca.). The first table contains the principal earthquakes; while other less important shocks, recorded or reported felt, are referred to in supplementary lists.

A list of provisional epicentres in the South-west Pacific (outside the New Zealand region) is also given. These epicentres are determined from local records, together with the readings from as many overseas stations as are available.

LIST OF NEW ZEALAND SEISMOGRAPH STATIONS.

Station Name and Abbreviation.	Position.		Height above M.S.L.	Lithologic Foundation.	Seismographs.	Observers.
	Latitude.	Longitude.				
Wellington (W) ..	41° 17' S	174° 46' E	Feet. 401	Greywacke	Milne-Shaw (N-S) Galitzin-Wilip (Z) Wood-Andersons (N-S) and (E-W) Jones or Geophone (Z) Imamura (three components)	Dominion Observatory, Central Station. Acting-Director— R. C. Hayes. Observer— W. M. Jones.
Arapuni (A) ..	38° 5' S	175° 39' E	212	Rhyolite tuffs	Milne (E-W)	Powerhouse Superintendent.
Rotorua (R) ..	38° 8' S	176° 15' E	930	Rhyolitic silts and gravels	Jaggar (E-W)	District Engineer, P.W. Dept.
Tuai (TU)	38° 48' S	177° 9' E	960	Gravels	Wood-Anderson (N-S)	Mr. H. C. Scott, P.W. Dept.
New Plymouth (N) ..	39° 4' S	174° 4' E	112	Ash, agglomerate, and lava	Wood-Anderson (E-W)	Superintendent, the Prison.
Hastings (H) ..	39° 38' S	176° 53' E	35	Alluvial sands, silts, and gravels	Jaggar (NE-SW)	Mr. H. de Denne.
Bunnythorpe (B) ..	40° 17' S	175° 36' E	197	Gravels, sands, and silts	Jaggar (NW-SE)	Mr. W. A. Waters.
Takaka (TA) ..	40° 51' S	172° 48' E	25	Alluvial gravels	Imamura (three components)	The Postmaster.
Greymouth (G) ..	42° 25' S	171° 13' E	14	Deltaic sands and gravels	Jaggar (E-W)	District Engineer, P.W. Dept.
Christchurch (C) ..	43° 32' S	172° 37' E	25	Alluvial sands, silts, and gravels	Galitzin (three components) Wood-Anderson (N-S)	Magnetic Observatory. Director—H. F. Skey. Observer—H. F. Baird.
Monowai (M) ..	45° 47' S	167° 37' E	538	Tertiary sandstone	Jaggar (E-W)	Mr. A. Walker.
Chatham Islands (CH)	43° 57' S	176° 31' W	210	Volcanic breccia	Milne (E-W)	Superintendent, Radio Station.

1,000/1/40—16038]

Part I - Distant Earthquakes.

Station	Phase	G.M.T. h. m. s.	Δ deg.	Remarks.
April 1	W	P 11 27 52	51	Az=+lmm.
		PcF 29 07		
		PP 30 00±		
		PPP 50		
		PcS 33 16		
		S 34 55		
		SS 38 25		
	C	P 11 27 56	49.1	Compression, az. NW
		iZ 31 23		Large compression.
		S 35 06		Largest on N.
	iN 57		sS?	
	iZ 36 09		Large compression.	
A	P 11 27.7			
	S 34.9			
10	C	P 19 13 22	22.7	Compression.
		S 17 30		
	W	e 19 17 -		possibly L waves
A	e 19 15.9			
16	W	P 6 21 00	95ca.	Az= -lmm. Focal depth possibly 200km. ca.
		SKS 31 21		
		S 32 00		
		PS 33 04		Very prolonged and prominent L-waves, with max.ampl. about 6n. 57m.
	C	P 6 21 14	94	Compression
		SKS 31 40		
		S 32 28		
		PS 33 38		L-waves commence 6n.48m. Coda lasted 3 hours.
	A	S 6 31.5		
	17	C	P? 21 41 41	36.6
		S 47 32		
W		S? 21 48		Heavy microseisms.
A	e 21 50ca.		Tremors.	
18	C	P 19 50 47	44.8	
		S 57 30		
	W	e 20 07		Traces in heavy microseisms.
24	W	P 10 30 10	43.5	
		S 36 36		
	C	P 10 30 12±	44.1	Compression; time eclipse failed
	S 36 51±		" " " "	
A	S 10 37			
27	C	P 9 41 54	34.7	
		S 47 32		
	W	S? 9 47.5		Very heavy microseisms.
	A	S? 9 46.0		

In addition, minor activity was recorded as follows:

	d. h. m.	d. h. m.	d. h. m.	d. h. m.	d. h. m.
<u>WELINGTON:</u> (L)	3 07 25	(L) 4 09 20	(L) 8 09 29	(L) 10 20 47	14 09 31
	14 15 12	19 21 27	(L) 24 20 50	26 12 21ca.	27 18 13+
<u>WELLSBOROUGH:</u>	3 07 19	4 09 17	7 15 04ca.	8 09 28ca.	10 12 00ca.
	10 20 51	14 09 15	14 15 08ca.	15 08 48ca.	18 06 00ca.
	27 11 37ca.	27 18 18ca.			
<u>WELLS:</u>	14 09 42	14 15 10	27 18 15+		

Part II - Local Earthquakes.

The principal local shocks were as follows:

Date 1940	Origin Time G. M. T. h. m.	Provisional Epicen- tre.		Stations recording shock	Remarks.
		Lat. S (deg.)	Long. E (deg.)		
Apr. 2	12 36.1	39 $\frac{1}{4}$	175 $\frac{3}{4}$	TU, N, W.	Felt Taumarunui, R-F 4+
	18 08.2	46 $\frac{1}{2}$	169	M, C	Felt Dunedin to Invercargill, max. R-F 3.
3	02 53.1	Eastern Bay of Plenty		TU	Felt Whakatane, R-F 5. Possibly deeper than normal.
12	22 11.9	within 0.5° of Christchurch		C, W.	Felt Christchurch, R-F 2, and Rangiora.
15	14 54.9	Eastern Bay of Plenty		TU, W.	Felt Whakatane, R-F 4.
17	19 44.4	Vicinity of Wan- ganui.		W	Felt Wanganui, R-F 3?
17	19 45.4	Vicinity of Wan- ganui		W	Felt Wanganui, R-F 4-5
19	06 41.5	40.1	176.2	B, H, TU, W, A, C.	Felt widely in North Island south of Napier, Tainape and Hawera, with max. R-F 6 at Dannevirke. Records and reports suggest the possibility of two shocks of nearly equal magnitude within one minute.

Following are the number of additional small shocks recorded at various stations:-

<u>WELLINGTON:</u>	39
<u>TUAI:</u>	25
<u>HASTINGS:</u>	2
<u>CHRISTCHURCH:</u>	2

Note: The New Plymouth seismograph was out of action for most of the month owing to clock trouble.

The following provisional epicentres in the South-west Pacific (outside the New Zealand region) have been determined, in continuation of the list given in bulletin P-96:-

Origin Time 1940 d. h. m.	Provisional Lat. (deg.)	Epicentre Long. (deg.)	Remarks.
Jan. 6 14 03.3	21 $\frac{3}{4}$ S	169 E	
26 06 41.7	15 S	167 E	
Feb. 12 08 21.0	23 S	177 W	Focal depth 200 - 250 km.
20 02 18.3	14 S	167 $\frac{1}{4}$ E	Focal depth 200 km. ca.