BULLETIN E. 27.

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH.

DOMINION OBSERVATORY, KELBURN, WELLINGTON,
NEW ZEALAND.

SEISMOLOGICAL REPORTS FOR FEBRUARY, 1931.

IN this report a large number of tremors and similar small movements have been omitted. In some parts of the records they are practically continuous, and it has been considered that they need not be shown in detail in the printed report, as they afford no opportunities for study.

The first quake recorded is that which occurred in Hawke's Bay District, R.-F. 10. Napier and Hastings were partially destroyed with considerable loss of life. The seismograph records, together with the geological evidence so far obtained, indicate a provisional epicentre near the coast-line of Hawke's Bay in latitude 39° 20′ S, longitude 177° 0′ E.

The reports of the various stations are arranged in the order in which the stations were established.

For notation used in this report, see "Modern Seismology," by G. W. Walker; and Monthly Notices of the Royal Astronomical Society, Geophysical Supplements.

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LATITUDE: 41° 17′ S. Longitude: 174° 46′ E. Height above M.S.L.: 401·5 ft.

INSTRUMENTS.

Milne-Shaw Horizontal Seismographs Nos. 13 and 36: Magnetic damping.
Galitzin-Wilip Vertical Seismograph: Photo-galvanometric registration.
Wood-Anderson Short-period Seismograph.

CONSTANTS.

Component.	Date of Determination.	Galvanometer Free Period.	Pendulum Period.	Damping.	$\frac{Ak}{\pi L}$
		Sec.	Sec.		
Milne-Shaw (N) ..	1930, Oct. 3 ..	..	9·8	20 : 1	..
Milne-Shaw (E) ..	1930, Sept. 30	..	9·8	20 : 1	..
Galitzin-Wilip (Z) ..	1930, Nov. 11	10·70	10·33	1·72 : 1	168·4
Wood-Anderson (N) ..	1931, Jan. 28	..	0·5	5 : 1	..

Date.	Phase.	Greenwich Time.	Period.	A_N.	A_E.	A_Z.	Dist.	Remarks.
1931.		h. m. s.	s.	μ	μ	μ	Deg.	
Feb. 2	P	22 47 20	..	..	..	..	2·6	Milne-Shaw put out of action at once.
	P*	47 24						R.-F. 10, in Hawke's Bay District.
	Pg	47 36						Napier and Hastings partially destroyed with considerable loss of life.
Feb. 2	P	22 52 38	..	..	..	..	2·7	Tentative epicentre: 39° 20′ S., 177° 0′ E. Time at origin=22 h. 46 m. 41 s.
	S	53 11						Confused.
Feb. 2	P	22 57 42	..	..	..	..	2·8	Confused. These readings are made with considerable difficulty, the ground being in motion all the time.
	S	58 16						Also in many places the traces cross one another.
Feb. 2	P	23 53 10	..	..	..	..	2·5	
	S	41						
Feb. 2	P	23 56 47	..	..	..	..	2·9	
	S	57 22						
Feb. 3	P	0 11 43	..	..	..	..	2·4	
	S	12 12						
Feb. 3	P	0 15 28	..	..	..	..	2·6	
	S	16 0						
Feb. 3	P	0 23 35	..	..	..	..	3·0	
	S	24 12						
Feb. 3	P	0 29 29	..	..	..	..	2·3	
	S	57						
Feb. 3	P	0 41 43	..	..	..	..	2·4	
	P*	51						
	Pg	56						
	S	42 12						
	Sg	25						
Feb. 3	P	0 48 12	..	..	..	..	3·1	
	S	50						
Feb. 3	P	0 52 35						
	P*	44						
	Pg	51						
Feb. 3	P	1 26 13	..	..	..	..	2·8	
	S	47						
	M	27 52	2	8	11	14		
Feb. 3	P	1 28 34	..	..	..	..	3·1	
	S	29 2						
Feb. 3	P	1 31 45	..	..	..	..	2·6	
	S	17						
	M	30	2	23	50	22		
Feb. 3	P	1 52 3	..	..	..	..	2·2	
	S	30						
Feb. 3	P	1 55 54						
	P*	56 4	..	..	..	..	2·4	
	S	56 23						
	M	50	2	20	33	18		

Date.	Phase.	Greenwich Time.	Period.	A_N.	A_E.	A_Z.	Dist.	Remarks.
1931.		h. m. s.	s.	μ	μ	μ	Deg.	
Feb. 3	P	2 9 29						
	Pg	41	..	..	..	..	2·5	
	S	10 0						
	Sg	20						
Feb. 3	P	2 10 49						
	S	11 22	..	..	..	..	2·7	
	M	11 30	2	47	43	45		
Feb. 3	P	2 26 31	..	..	..	..	2·2	
	S	58						
Feb. 3	P	2 33 35	..	..	..	..	2·4	
	S	34 5						
Feb. 3	P	3 10 38	..	..	..	..	2·6	
	P*	10 47						
	Pg	55						
	Sg	11 30						
Feb. 3	P	3 37 52	..	..	..	..	2·9	
	S	38 27						
Feb. 3	P	3 40 10	..	..	..	..	3·3	
	S	50						
Feb. 3	P	3 59 33	..	..	..	..	2·1	
	S	59						
Feb. 3	P	4 49 1	..	..	..	..	2·4	
	S	30						
Feb. 3	P	4 56 19	..	..	..	..	2·7	
	S	52						
Feb. 3	P	5 5 14	..	..	..	..	2·4	
	Pg	32						
	S	44						
	Sg	6 7						
Feb. 3	P	5 30 42	..	..	..	..	2·8	
	S	31 16						
Feb. 3	P	5 36 9	..	..	..	..	2·5	
	S	40						
Feb. 3	P	5 40 9	..	..	..	..	2·4	
	S	39						
Feb. 3	P	5 46 33						
	P*	42	..	..	..	..	2·4	
	Pg	50						
	S	47 3						
	M	20	2	40	33	37	..	R.-F. 2, in Wellington.
Feb. 3	P	6 8 40						
	S	9 8						
Feb. 3	P	6 29 41	..	..	..	..	2·7	
	S	30 14						
	M	6 31	2	94	100	44	..	R.-F. 3, in Wellington.

Date.	Phase.	Greenwich Time.	Period.	A_N.	A_E.	A_Z.	Dist.	Remarks.
1931.		h. m. s.	s.	μ	μ	μ	Deg.	
Feb. 3	P	6 56 44	..	..	..	..	2·5	
	S	57 15						
Feb. 3	P	7 0 24						
	P*	33	..	..	..	..	2·3	
	Pg	40						
	S	52						
	S*	1 7						
Feb. 3	P	7 11 12	..	..	..	..	3·0	
	S	41 48						
Feb. 3	P	7 43 30	..	..	..	..	2·6	
	P*	39						
	Pg	48						
	S	44 2						
	S*	13						
	Sg	24						
Feb. 3	P	7 35 39	..	..	..	..	2·7	
	S	36 12						
Feb. 3	P	7 46 41	..	..	..	..	2·8	
	S	47 15						
Feb. 3	P	7 56 44	..	..	..	..	2·5	
	S	57 15						
Feb. 3	P	8 26 40	..	..	..	..	2·5	
	P*	48						
	Pg	57						
	S	27 11						
	Sg	34						
Feb. 3	P	8 37 39	..	..	..	..	2·7	
	S	38 12						
Feb. 3	P	8 41 29	..	..	..	..	2·5	Hawke's Bay, R.-F. 7. Epicentre: 39°·5 S., 177° E.
	P*	39						
	Pg	44						
	S	42 2						
	S*	13						
	M	8 43	2	250	290	70		
Feb. 3	P	9 11 28	..	..	..	..	2·4	
	S	58						
Feb. 3	P	9 13 6						
	S	42	..	..	..	..	3·0	
Feb. 3	P	9 24 22	..	..	..	..	2·4	
	S	52						
Feb. 3	P	9 59 40	..	..	..	..	2·7	
	S	10 0 13	..	..	..	..	..	All records about this time much confused.
Feb. 3	P	10 1 32						
	P*	41	..	..	..	..	2·4	
	Pg	48						
	S	2 1						
	Sg	23						

Date.	Phase.	Greenwich Time.	Period.	A_N.	A_E.	A_Z.	Dist.	Remarks.
1931.		h. m. s.	s.	μ	μ	μ	Deg.	
Feb. 3	P	11 48 16	..	..	..	..	3·0	
	S	53						
Feb. 3	P	12 13 58	..	..	..	..	3·0	
	S	14 34						
Feb. 3	P	12 28 18	..	..	..	..	2·0	
	S	42						
Feb. 3	P	12 34 29	..	..	..	..	3·1	
	S	35 7						
	M	25	2	87	87	63		
Feb. 3	P	13 24 49	..	..	..	..	2·8	
	S	25 23						
Feb. 3	P	14 16 17	..	..	..	..	2·0	
	S	41						
	M	17 20	2	33	20	18		
Feb. 3	P	15 10 49	..	..	..	..	1·8	Doubtful result; not clear.
	S	11 11						
Feb. 3	P	16 6 25	..	..	..	..	3·1	
	S	7 3						
Feb. 3	P	16 37 51	..	..	..	..	2·5	
	P*	38 1						
	S	22						
	Sg	43						
Feb. 3	P	17 25 19	..	..	..	..	2·6	
	S	51						
Feb. 3	P	18 56 19	..	..	..	..	3·2	
	S	58						
Feb. 3	P	19 21 32						
	P*	43	..	..	..	..	2·4	
	Pg	50						
	S	22 2						
	Sg	11						
Feb. 3	P	20 24 43	..	..	..	..	2·8	
	S	25 17						
Feb. 3	..	20 28	..	..	..	..	..	Local, small.
Feb. 3	P	20 37 21	..	..	..	..	1·5	Not a Hawke's Bay shock.
	S	40						
Feb. 3	P	20 56 38	..	..	..	..	1·8	Reported felt at Murchison. R.-F. 4.
	S	57 0						
	M	10	2	20	30	6		
Feb. 3	P	21 5 35	..	..	..	..	2·4	
	S	6 15						
Feb. 3	P	21 27 21	..	..	..	..	2·7	
	S	54						

Date.	Phase.	Greenwich Time.	Period.	A_N.	A_E.	A_Z.	Dist.	Remarks.
1931.		h. m. s.	s.	μ	μ	μ	Deg.	
Feb. 4	P	1 41 22	..	..	..	..	2·0	
	S	46						
Feb. 4	P	2 30 12	..	..	..	..	2·8	
	S	46						
Feb. 4	P	4 45 47	..	..	..	..	2·4	
	P*	57						
	S	46 17						
	S*	28						
	Sg	39						
	M	47 15	2	70	120	90		
Feb. 4	P	6 2 33	..	..	..	..	2·7	
	S	3 6						
Feb. 4	P	6 43 33	..	..	..	..	2·7	
	S	44 6						
Feb. 4	P	8 15 29	..	..	..	..	2·8	
	S	16 3						
Feb. 4	P	8 26 24	..	..	..	..	2·4	
	P*	34						
	S	27 54						
	S*	28 7						
Feb. 4	P	9 5 44	..	..	..	..	2·5	
	S	6 15						
Feb. 4	P	12 37 30	..	..	..	..	2·6	
	S	38 2						
Feb. 4	P	13 30 48						
	S	31 18	..	..	..	..	2·4	
Feb. 4	P	14 5 38	..	..	..	..	2·4	
	P*	47						
	Pg	6 3						
	S	8						
	S*	24						
	Sg	27						
	M	35	2	87	106	63		
Feb. 4	P	15 49 53	..	..	..	..	2·4	
	S	50 23						
Feb. 4	P	16 43 25	..	..	..	..	2·9	
	S	44 0						
Feb. 4	P	16 48 10	..	..	..	..	3·1	
	S	48						
Feb. 4	P	18 10 2	..	..	..	..	2·6	
	S	34						
Feb. 4	P	18 11 43	..	..	..	..	3·6	
	S	12 26						
Feb. 4	P	18 17 52	..	..	..	..	3·3	
	S	18 32						
	M	18 19	2	13	16	20		

Date.	Phase.	Greenwich Time.	Period.	A_N.	A_E.	A_Z.	Dist.	Remarks.
1931.		h. m. s.	s.	μ	μ	μ	Deg.	
Feb. 4	P	18 59 57	..	..	..	..	3·5	
	S	19 0 39						
Feb. 4	P	23 16 6	..	..	..	..	2·2	
	S	33						
Feb. 5	P	0 53 13	..	..	..	..	3·4	
	S	54						
Feb. 5	P	2 31 26	..	..	..	..	3·3	
	S	32 6						
Feb. 5	P	2 37 45	..	..	..	..	2·9	
	S	38 20						
	M	30	2	13	13	8		
Feb. 5	P	7 38 0	..	..	..	..	2·9	
	S	35						
Feb. 5	P	7 42 51	..	..	..	..	2·9	
	S	43 26						
Feb. 5	P	8 57 46	..	..	..	..	..	Hawke's Bay, R.-F. 6.
	P*	54						
	Pg	58 1						
	S*	28						
	M	59	2					
Feb. 5		9 10	12	94	180	85	..	Part of a remote quake obscured by the near one. Its distance from Suva is 11 deg.
Feb. 5	P	9 34 2	..	..	..	..	3·2	
	S	41						
Feb. 5	P	10 39 20						
	S	50	..	..	..	..	2·4	Not clear.
	M	40 10	2	15	18	11		
Feb. 5	P	12 1 41	..	..	..	..	3·8	
	S	2 12						
Feb. 5	P	12 27 30	..	..	..	..	2·9	
	S	28 5						
Feb. 5	P	14 30 11	..	..	..	..	3·2	
	S	50						
Feb. 5	P	14 33 2	..	..	..	..	2·4	
	S	31						
	M	35	2	5	7	4		
Feb. 5	P	15 30 57	..	..	..	..	2·4	
	S	31 26						
Feb. 5	P	20 34 6	..	..	..	..	2·5	From 20 h. 30 m. tremors of short period are continuous for several hours.
	S	37						
Feb. 5	P	22 32 45	..	..	..	..	2·4	
	S	33 15						
	M	40	2	13	15	18		
Feb. 6	e	0 34 32	..	..	..	..	..	Indistinct. Karamea, R.-F. 3.
	e	56						

Date.	Phase.	Greenwich Time.	Period.	A_N.	A_E.	A_Z.	Dist.	Remarks.
1931.		h. m. s.	s.	μ	μ	μ	Deg.	
Feb. 6	P	3 9 55	..	..	..	..	3·2	
	S	10 34						
Feb. 6	P	3 54 10	..	..	..	..	3·1	
	S	48						
Feb. 6	P	7 1 26	..	..	..	..	2·3	
	S	54						
Feb. 6	P	7 46 20	..	..	..	..	2·7	
	S	47 53						
Feb. 6	Pg	9 41 14	..	..	..	..	1·8	Probably not a Hawke's Bay Shock.
	Sg	38						
Feb. 6	P	10 8 32	..	..	..	..	3·0	
	S	9 8						
Feb. 6	P	11 31 24	..	..	..	..	3·8	
	S	32 9						
	M	30	2	6	10	6		
Feb. 6	P	13 45 10	..	..	..	..	2·1	
	S	36						
Feb. 6	P	15 1 12	..	..	..	..	2·7	
	S	45						
Feb. 6	P	16 41 38	..	..	..	..	1·7	Probably not a Hawke's Bay shock.
	S	42 1						
Feb. 6	P	17 2 37	..	..	..	..	2·4	
	S	3 7						
Feb. 6	P	21 31 2	..	..	..	..	2·4	
	S	32						
Feb. 6	P	21 58 26	..	..	..	..	3·2	
	S	59 5						
Feb. 6	P	22 55 18	..	..	..	..	4·3	Evidently not a Hawke's Bay shock.
	S	56 10						
Feb. 6	P	23 28 14	..	..	..	..	2·5	
	P*	24						
	Pg	33						
	S	45						
	Sg	29 5						
	M	15	2	7	12	6		
Feb. 7	P	0 13 54						
	P*	14 2	..	..	..	..	2·5	
	Pg	11						
	S	25						
	Sg	45						
	M	50	2	7	10	30		
Feb. 7	P	4 5 52						
	P*	6 1	..	..	..	..	2·9	
	Pg	10						
	S	27						
	S*	36						
	Sg	44						
	M	50	2	40	58	30		

Date.	Phase.	Greenwich Time.	Period.	A_N.	A_E.	A_Z.	Dist.	Remarks.
1931.		h. m. s.	s.	μ	μ	μ	Deg.	
Feb. 7	P	4 45 39	..	..	..	..	2·3	
	S	46 7						
Feb. 7	P	10 8 34	..	...	..	..	3·0	
	S	9 10						
	M	20	2	23	36	18		
Feb. 7	P	12 27 27	..	..	..	..	3·0	
	S	28 3						
Feb. 7	P	13 41 41	..	..	..	..	3·6	
	S	42 24						
Feb. 7	P	15 26 53	..	..	..	..	3·0	
	S	27 29						
Feb. 8	P	0 20 38	..	..	..	..	2·5	
	S	21 9						
Feb. 8	P	1 44 30	..	..	..	..	2·4	Max., R.-F. 6.
	P*	39						
	S	45 0						
	M	1 45	2	285	420	..		Felt in Wellington. R.-F. 4.
Feb. 8	P	5 17 14	..	..	..	..	2·7	
	S	47						
	Sg	18 12						
Feb. 8	P	7 21 33	..	..	..	..	2·9	
	S	22 9						
	M	30	2	8	10			
Feb. 8	P	10 11 39	..	..	..	..	2·5	Max., R.-F. 5.
	S	12 10						
	M	30	2	72	80	70		
Feb. 8	P	18 23 27	..	..	..	..	3·4	
	S	24 8						
Feb. 8	P	20 41 43	..	..	..	..	2·3	
	S	42 11						
	M	30	2	54	50	40		
Feb. 9	P	1 37 34	..	..	..	..	3·1	
	S	38 12						
	M	20	2	4	4	3		
Feb. 9	P	3 36 0	..	..	..	..	2·9	
	S	35						
Feb. 9		11 54	..	..	..	..	..	Confused; phases not recognizable.
Feb. 9	P	15 8 25	..	..	..	..	3·0	
	S	9 1						
Feb. 9	P	16 30 7	..	..	..	..	2·7	
	S	40						
	M	16 31	2	4	..	6		
Feb. 9	P	20 14 7	..	..	..	..	2·4	
	S	36						

Date.	Phase.	Greenwich Time.			Period.	A_N.	A_E.	A_Z.	Dist.	Remarks.
1931.		h.	m.	s.	s.	μ	μ	μ	Deg.	
Feb. 10	Pz	6	45	52	..	..	..	..	72	0 = 6 h. 34 m. 24 s.
	Sz		55	16						
	SR_1	7	0	44						
	L		10	55	..	..	..	..	..	According to U.S.C.G.S., 5 S., 102 E.
	M		16	0	20	..	700			
	M			50	20	270				
	M			55	18	..	..	370		
Feb. 10	P	7	5	3	..	..	..	..	2·7	Not shown by Milne-Shaw, but found on Wood-Anderson, which does not record the distant quake.
	S			36						
Feb. 10	P	7	31	18						
	S			50	..	..	..	..	2·6	
Feb. 10	P	8	7	23						
	S			53	..	..	..	..	2·4	
Feb. 10	..	10	39		..	..	..	..	..	Local, small.
Feb. 10	P	17	15	20	..	..	..	..	2·4	
	S			50						
	M		16	20	2	9	11	6		
Feb. 10	P	17	21	18	..	..	..	..	2·5	
	S			49						
	M		22	40	2	70	50	90	..	Felt in Wellington. R.-F. 2.
Feb. 10	P	20	51	44	..	..	..	..	2·4	
	S		52	13						
Feb. 10	P	21	29	56	..	..	..	..	2·5	
	S		30	27						
Feb. 10	P	22	46	24	..	..	..	..	2·2	
	S			51						
Feb. 11	P	0	15	53	..	..	..	..	2·3	
	S		16	21						
	M			40	2	3	2	5		
Feb. 11	P	17	3	20	..	..	..	..	2·5	
	P*			30						
	Pg			36						
	S			51						
	Sg		4	12						
	M			30	2	245	260	140	..	Felt in Wellington. R.-F. 3.
Feb. 12	S	6	4	52						
			9	24	..	..	..	..	72	After-shock from same epicentre as on Feb. 10.
			14	50						
	L		21	40						
	M	6	27		24	46	95	40		
Feb. 12		13	7		..	..	..	..	..	Local, small.
Feb. 12	P	21	42	6						
	S		43	11	..	..	..	..	5·6	Reported felt in Otago. R.-F. 4, at Queenstown.
	M			20	3	3	2			
Feb. 13	P	1	28	0	..	..	..	..	2·6	Milne-Shaw put out of action at once. Lat. 39·8 S., long. 177·8 E. 0 = 1 h. 27 m. 21 s. This is the most severe after-shock experienced. At Napier and Hastings the movement was much less than that on Feb. 2, but at other localities further inland it was regarded as the more violent of the two.
	Pg			10						

Date.	Phase.	Greenwich Time.			Period.	A_N.	A_E.	A_Z.	Dist.	Remarks.
1931.		h.	m.	s.	s.	μ	μ	μ	Deg.	
Feb. 13	P	1	40	32	..	..	..	..	2·7	Recorded by Wood-Anderson, but much confused.
	S		41	5						
Feb. 13	P	1	55	14	..	..	..	..	2·4	
	P*			24						
	Pg			32						
	S			44						
Feb. 13	P	2	5	44	..	..	..	..	2·8	
	P*			53						
	S		6	18						
	Sg			31						
Feb. 13	P	2	53	48	..	..	..	..	2·6	
	P*			52						
	S		54	20						
Feb. 13	P	3	5	51	..	..	..	..	2·4	
	P*		6	0						
	Pg			8						
	S			20						
Feb. 13	P	3	58	41	..	..	..	..	2·6	
	P*			51						
	Pg			59						
	S		59	13						
	Sg			27						
	M			50	2	27	8			
Feb. 13	P	4	50	10	..	..	..	..	2·0	
	S			33						
Feb. 13	P	4	56	54	..	..	..	..	2·3	
	S		57	23						
Feb. 13	P	9	49	52	..	..	..	..	2·6	
	P*		50	0						
	Pg			9						
	S			24						
	Sg			32						
	M			55	2	13	22	8		
Feb. 13	P	11	48	37	..	..	..	..	2·2	
	P*			46						
	Pg			53						
	S		49	4						
	M			50	2	16	22	15		
Feb. 13	P	13	42	54	..	..	..	..	2·4	
	P*		43	3						
	S			24						
	S*			36						
	Sg			45						
	M		44		2	5	6	4		
Feb. 13	Pg	15	16	28	..	..	..	..	1·5	Shown on Takaka seismogram as small local shock.
	Sg			48						
Feb. 13	P	15	40	42						
	P*			51	..	..	..	..	2·4	
	Pg		41	3						
	S			12						
	M			40	2	6	9			

Date.	Phase.	Greenwich Time.			Period.	A_N.	A_E.	A_Z.	Dist.	Remarks.
1931.		h.	m.	s.	s.	μ	μ	μ	Deg.	
Feb. 13	P	20	58	29	..	..	..	..	2·4	
	Pg			45						
	S			58						
	Sg		59	21						
	M			30	2	16	13	15		
Feb. 14	P	0	34	41	..	..	..	..	2·3	
	P*			51						
	Pg			56						
	S		35	9						
	S*			24						
Feb. 14	P	2	20	38	..	..	..	..	2·4	
	P*			48						
	Pg			56						
	S		21	8						
	M			20	2	3	5	8		
Feb. 14	S	14	19	52	..	..	..	..	..	This appears to be another after-shock from the epicentre of Feb. 10 and 12.
	L		35	50						
	M		40	30	20	24	40	36		
Feb. 14	P	14	55	30	..	..	..	..	2·3	
	Pg			44						
	S			58						
	Sg		56	19						
Feb. 14	P	21	37	26	..	..	..	..	2·5	
	P*		38	5						
	Pg			11	..	..	..	..	..	Not found on Galitzin.
	S			27						
	Sg			46	..	..	..	..	..	No vertical component ?
	M			50	2	2	5			
Feb. 15	P	6	6	21	..	..	..	..	2·4	
	P*			31						
	S			51						
	M		7	0	2	3	5	2		
Feb. 15	P	6	18	34	..	..	..	..	2·8	
	P*			45						
	Pg			51						
	S		19	8						
	S*			19						
	Sg			24						
	M			30	2	7	12	6		
Feb. 16	Pg	7	13	4	..	..	..	..	0·7	Small.
	Sg			13						
Feb. 16	Pg	11	49	7	..	..	..	..	1·4	South Island ; Max., R.-F. 6.
	Sg			26						
	M			30	2 ?	35	60	9	..	Felt in Wellington. R.-F. 2.
Feb. 16	e 1	19	1	33						
	e 2		15	0	..	..	..	..	85	e 1 may be P, but e 2 cannot be S.
	L		31	40						
	M	19	35		20	19	9	13	..	Epicentre at sea N.E. of Japan. 0 = 18 h. 48 m. 25 s., computed from data in Koti and Nagoya seismological reports.

Date.	Phase.	Greenwich Time.			Period.	A_N.	A_E.	A_Z.	Dist.	Remarks.
1931.		h.	m.	s.	s.	μ	μ	μ	Deg.	
Feb. 16	P	21	27	31	..	..	..	..	2·5	South Island ; R.-F. 4.
	S		28	2						
Feb. 17	S	1	56	56	..	..	..	..	20	Suva shows d = 15 deg. Epicentre probably in vicinity of New Hebrides.
	L		59	50						
	M	2	0	20	16	16	13	10		
Feb. 18	P	7	43	46	..	..	..	..	2·6	
	P*			55						
	Pg		44	0						
	S			18						
	Sg			35						
	M			45	2	..	..	5		
Feb. 19	P	6	39	54	..	..	..	..	2·5	
	P*		40	4						
	S			25						
	S*			37						
	Sg			48						
Feb. 19	e 1	18	1	10	..	..	..	..	..	According to Batavia, epicentre is south of Sumatra. Not clear whether same as that of Feb. 10 and 12.
	e 2		7	43						
	e 3		11	20						
	L		17	20	27					
	M		22	45	22	65	130	85		
Feb. 20	Pg	5	32	13	..	..	..	..	1·5	
	Sg			33						
Feb. 20	e	5	47	0	..	..	..	..	83 ?	Manchuria. 0 = 5 h. 33 m. 23 s. Milne-Shaw seismograms peculiar, no trace of L and M waves. According to Jesuit S.A. and other authorities, the focus is abnormally deep.
	PR_1		49	54						
	S		56	27						
Feb. 20	P	13	57	57						
	P*		58	8	..	..	..	..	2·6	Wairoa ; R.-F. 6.
	Pg			11						
	S			29						
	S*			41						
	Sg			50						
	M	13	39	0	2	55	67	..	..	Galitzin not working.
Feb. 20	P	17	14	10	..	..	..	..	2·5	
	S			41						
Feb. 21	P	0	22	24	..	..	..	..	2·6	
	S			56						
Feb. 21	P	13	40	17	..	..	..	..	2·6	
	Pg			39						
	S			52						
	M		41		2	7	11	6		
Feb. 22	Pg	18	30	10	..	..	..	..	1·0	
	Sg			24						
Feb. 23	P	1	10	28						
	S			58						
Feb. 23	P	10	25	46	..	..	..	..	1·9	South Island. R.-F. 3.
	S		26	9						

Date.	Phase.	Greenwich Time.			Period.	A_N.	A_E.	A_Z.	Dist.	Remarks.
1931.		h.	m.	s.	s.	μ	μ	μ	Deg.	
Feb. 24	P	8	26	50	..	..	..	..	2·5	Max., R.-F. 5.
	P*		27	0						
	Pg			7						
	S			21						
	S*			32						
	M			45	2	20	30	22		
Feb. 24	P	11	31	8	..	..	..	..	1·9	
	S			31						
Feb. 24	Pg	23	0	8	..	..	..	..	0·4	
	Sg			13						
	M			20	2	25	33			
Feb. 24	Pg	23	11	57	..	..	..	..	0·4	Small.
	Sg		12	2						
Feb. 24	Pg	23	15	31	..	..	..	..	0·4	Small.
	Sg			37						
Feb. 24	Pg	23	15	55	..	..	..	..	0·4	Small.
	Sg		16	1						
Feb. 24	P	23	43	29	..	..	..	..	2·8	Max., R.-F. 5.
	P*			38						
	Pg			59						
	S		44	3						
	S*			12						
	Sg			21						
	M			30	2	60	23	77		
Feb. 25	P	7	29	48	..	..	..	..	1·5	
	S		30	8						
Feb. 25	M	8	31		2	10	15	9	..	Confused shock, instruments not in agreement.
Feb. 25	..	20			..	..	..	..	..	Traces of remote quake. Suva record shows distance = 5 deg.
Feb. 25	P	23	36	16	..	..	..	..	3·1	
	S		36	54						
	M		37	0	2	3	5	6		
Feb. 26	Pg	3	6	14	..	..	.	..	0·5	Cook Strait. R.-F. 4.
	Sg			21						
	M			30	2	50	45	40		
Feb. 26	P	3	19	20	..	..	..	..	1·6	
	S			40						
Feb. 26	Pg	5	16	39	..	..	..	..	0·5	Local, very small.
	Sg			45						
Feb. 26	P	9	21	35	..	..	..	..	2·5	
	S		22	6						
	M			10	2	6	7	5		
Feb. 26	P	15	5	17	..	..	..	..	2·0	
	S			42						
Feb. 26	P	18	49	29	..	..	..	.	2·0	Felt at Murchison. R.-F. 6. Epicentre : 42° S., 172° E.
	P*			37						
	Pg			42						
	S			54						
	M		50	0	2	190	135	130		

Date.	Phase.	Greenwich Time.			Period.	A_N.	A_E.	A_Z.	Dist.	Remarks.
1931.		h.	m.	s.	s.	μ	μ	μ	Deg.	
Feb. 26	P	19	25	52	..	..	..	..	2·7	
	S		26	25						
	M			30	2	7	8	4		
Feb. 27	P	7	36	12	..	..	..	..	3·0	
	S			48						
	M		37	10	2	8	10	7		
Feb. 27	P	9	47	57	..	..	..	..	76	At sea, south-east from Philippine Islands. Manila gives : In region of 2 N., 126 E.
	S		57	36						
	L	10	11							
	M		17		18	33				
	M		18		18	..	35	28		
Feb. 27	..	14	27		..	.	..	..	..	A series of waves, some have period 6 sec., probably near by, not recorded elsewhere.
Feb. 28	P	16	47	23						
	P*			34	..	..	..	..	3·0	
	S			59						
	S*		48	3						
	M			15	2	9	16	10		
Feb. 28	P	18	31	53	..	..	..	..	2·4	
	P*		32	2						
	Pg			8						
	S			22						
	S*			36						
	Sg			43						
	M			50	2	1	4			

Suva, Fiji.

LATITUDE: 18° 9′ S. LONGITUDE: 178° 26′ E. HEIGHT ABOVE M.S.L.: 10 ft.
INSTRUMENT: Milne Twin-boom Horizontal Seismograph. Undamped.

CONSTANTS.
(1931, Feb. 7.)

Component.	Pendulum Period.	Magnification.
	Sec.	
N	10·0	6
E	8·0	6

OBSERVER: Miss MUNE, Telephone Exchange, Suva.

Date.	Phase.	G.M.T.	Distance.	Remarks.
1931.		h. m.	Deg.	
Feb. 2	P	22 51·8	..	Δ T not known.
	e	54	23·5	New Zealand earthquake.
	S	56·0	..	Large amplitudes; continuous movements till paper changed at 0 h. 11 m.
	L	58·5	..	
Feb. 3	..	..	..	Movements almost continuous.
Feb. 4	..	..	..	
Feb. 5	e	8 50	11	Doubtful.
	P	51·8		
	S	54·0		
	L	54·6		
Feb. 10	..	7	..	Weak record of quake south of Sumatra.
Feb. 13	P	1 31·8	23·5	New Zealand.
	S	36·0		
Feb. 17	P	1 51·2	15	
	S	54·1		
	L	55		
Feb. 19	..	18	..	Traces only; repetition of quake south of Sumatra.
Feb. 25	P	20 54·2	5	
	S	55·1		
	L	55·3		

Arapuni.

LATITUDE: 38° 5′ S. LONGITUDE: 175° 39′ E.
INSTRUMENT: Milne Horizontal Seismograph, undamped: E.-W. component.
CONSTANTS (1931, February): Pendulum Period = 27 secs. Magnification = 5·6.
OBSERVER: District Engineer, Public Works Department, Arapuni.

NOTE.—Throughout the report for this station, the G.M.T. is only approximate, as the clock correction is not known.

Date.	Phase.	G.M.T.	Period.	A.	Distance.	Remarks.
1931.		h. m. s.	Secs.	mms.	Deg.	
Feb. 2 ..	P (?)	22 47 (20)	..	..	1·7	May be P*. Δ T not known.
	Pg	47 30				
	S	47 41				
Feb. 2 ..	P	23 56 —	..	..	..	Very confused record. Δ T not known.
Feb. 3 ..	P	8 41 (30)	..	..	2·2	Δ T not known.
	Pg	41 42				
	S	41 57	..	2		
Feb. 3 ..	P	12 34 (0)	.	..	2·0	,,
	S	34 24				
	Sg	34 36	..	1		
Feb. 4 ..	P	4 46 (0)	..	..	2·0	,,
	S	46 24				
	Sg	46 42	..	2		
Feb. 4 ..	P	14 5 (40)	..	..	2·0	,,
	S	6 4	..	1		
Feb. 4 ..	P (?)	23 16 (0)	..	..	1·7 ?	,,
	S	16 21				
	Sg	16 36	..	1		
Feb. 5 ..	P	8 58 (0)	..	..	2·0	,,
	P*	58 6				
	Pg	58 12				
	S	58 24				
	Sg	58 39	..	3		
Feb. 8 ..	P	1 44 (30)	..	..	2·1	,,
	Pg	44 42				
	S	56				
	Sg	45 8	..	9		
Feb. 8 ..	P	10 11 (0)	..	..	1·9	,,
	S	11 23	..	1		
Feb. 10 ..	P	6 46 (0)	..	.	73	,,
	PR_1	50 24				
	S	55 24				
	SR_1	7 1 36				
	L	8				
	M	13	20	14		
Feb. 10 ..	P	17 21 (0) ?	..	..	2·0 ?	,,
	S	21 24	..	2		

Date.	Phase.	G.M.T.	Period.	A.	Distance.	Remarks.
1931.		h. m. s.	Secs.	mms.	Deg.	
Feb. 11 .	P	17 3 (20)	..	..	2·0	ΔT not known.
	Pg	3 32				
	S	3 44				
	Sg	4 2	..	9		
Feb. 12 ..	e	6 23 —				
	M	28 —	21	3		
Feb. 13 ..	P	1 28 (10)	..	..	1·8	Very confused record. ΔT not known.
	Pg	28 16				
	Sg	28 39	..	23		
Feb. 14 ..	e	14 20 —	..	..	..	ΔT not known.
	M	25 —	22	3		
Feb. 19 ..	e	18 2 —	..	..	..	,,
	L	14 —				
	M	20 —	22	5		
Feb. 24 ..	P	8 27 (0)	..	..	2·0	,,
	S	24	..	1		
Feb. 24 ..	P	23 0 (0)	..	..	2·0	,,
	S	0 24	..	1		
Feb. 26 ..	P	18 50 (0)	..	..	5·0	,,
	Pg (?)	30				
	S	51 0	..	3		
Feb. 27 ..	e	10 1	..	..	..	,,
	L	12				
	M	15	25	2		

Takaka.

LATITUDE : 40° 51′ S. LONGITUDE : 172° 48′ E.

INSTRUMENT : Imamura Strong Motion Seismograph : three components ; oil damping.

CONSTANTS.

Component.	Pendulum Free Period.	Damping.	Magnification.
	Sec.		
N	10	30 : 1	2
E	10	20 : 1	2
Z	4	1·5 : 1	2

Observer : Mr. W. J. SMITH, Postmaster, Takaka.

NOTE.—Throughout the report for this station, the G.M.T. is only approximate, as the clock correction is not known.

Date.	Phase.	G.M.T.	Period.	$A_{N.}$	$A_{E.}$	$A_{Z.}$	Distance.	Remarks.
1931.		h. m. s.	Secs.	mms.	mms.	mms.	Deg.	
Feb. 2	P	22 47 (30)	..	..	..	..	4·4	ΔT not known.
	P*	45						
	Pg	48 0						
	S	23						
	Sg	45						
	M	49 30	14	31	15	5		
Feb. 2	P	23 54 (0)	..	..	..	..	3·9	,,
	S	47						
	S*	52						
Feb. 2	P	23 57 (0)	..	..	..	..	3·8	,,
	Pg	22						
	S	46						
Feb. 3	P	0 12 (0)	..	..	..	..	3·8	,,
	P*	12						
	S	46						
Feb. 3	P ?	1 32 (0)	..	..	..	..	3·1 ?	,,
	S	38						
Feb. 3	P	2 11 (0)	..	..	..	..	4·2	,,
	S	50						
Feb. 3	P ?	5 47 (0)	..	..	..	..	3·0 ?	,,
	S	37						
Feb. 3	P	6 30 (0)	..	..	..	..	3·2	,,
	P*	14						
	S	30 39						
Feb. 3	P	8 42 (0)	..	..	..	..	3·6	,,
	P*	9						
	Pg	22						
	S	43	..	1	1			
	Sg	43 16						
Feb. 3	P	12 35 (0)	..	..	..	..	3·1	,,
	S	38						
	Sg	36 5						

Date.	Phase.	G.M.T.	Period.	A_N.	A_E.	A_Z.	Distance.	Remarks.
1931.		h. m. s.	Secs.	mms.	mms.	mms.	Deg.	
Feb. 3	P	14 17 (0)	..	..	..	..	3·3	ΔT not known.
	S	40						
Feb. 4	P	4 46 (0)	..	..	..	..	4·1	,,
	P*	12						
	S	49						
Feb. 4	P	14 6 (0)	..	..	..	..	3·6	,,
	S	43						
	Sg	7 15						
Feb. 4	P	23 17 (0)	..	..	..	..	3·2	,,
	S	39						
Feb. 5	P	8 58 (0)	..	..	..	..	4·0	,,
	P*	9						
	Ps	18						
	S	48						
Feb. 7	P	4 6 (0)	..	..	..	..	3·8	,,
	S	46						
Feb. 8	P	1 45 (0)	..	..	..	..	4·0	,,
	P*	9						
	Pg	27						
	S	48						
	S*	46 0	3	3	2	1		
	Sg	24						
Feb. 8	P	10 12 (0)	..	..	..	..	3·8	,,
	S	46						
Feb. 11	P	17 4 (0)	..	..	..	..	3·3	,,
	Pg	18						
	S	40						
	S*	51						
	M	54	3	1	2			
Feb. 13	P	1 28 (17)	..	..	..	..	4·3	,,
	Pq ?	20						
	P*	34						
	Pg	52						
	S	29 9						
	S*	20						
	Sg	41						
	M	50	6	17	21	4		
Feb. 16	Sg	11 49 (0)	..	..	..	..	..	Felt at Takaka. ΔT not known.
Feb. 25	P	23 44 (0)	..	..	..	..	3·6	ΔT not known.
	S	43						
Feb. 26	Pg	18 50 (0)	..	..	..	..	1·2	,,
	Sg	14						
	M	20	2	4	3	1		

Hastings.

Latitude: 39° 38′. Longitude: 176° 53′ E.

Instrument: Milne-Jaggar Local Shock Recorder.

Observer: Mr. Henry de Denne, 304 South Nelson Street, Hastings.

Note.—Throughout the report for this station, the G.M.T. is only approximate, as the clock correction is not known.

Date.	Phase.	G.M.T.	Maximum Amplitude.	Distance.	Remarks.
1931.		h. m. s.	mms.	Deg.	
Feb. 6	Pg	7 46 (0)	19	0·3	ΔT not known.
	Sg	4			
Feb. 7	Pg	4 5 (0)	24	0·3	,,
	Sg	4			
Feb. 8	Pg	5 17 (0)	..	0·6	,,
	Sg	7			
Feb. 10	Pg	8 7 (0)	25	0·4	,,
	Sg	5			
Feb. 10	Pg	16 3 (0)	4	0·2	,,
	Sg	2			
Feb. 10	Pg	17 15 (0)	5	0·5	,,
	Sg	6			
Feb. 10	Pg	17 21 (0)	18	0·3	,,
	Sg	4			
Feb. 10	Pg	19 27 (0)	3	0·3	,,
	Sg	4			
Feb. 11	Pg	0 15 (0)	3	0·4	,,
	Sg	5			
Feb. 11	Pg	17 30 (0)	2	0·3	,,
	Sg	4			
Feb. 11	Pg	19 29 (0)	1	0·2	,,
	Sg	3			
Feb. 12	Pg	14 30 (0)	4	0·2	,,
	Sg	3			
Feb. 12	Pg	17 4 (0)	1	0·3	,,
	Sg	4			
Feb. 13	Pg	1 30 (0)	30+	0·3 ?	,,
	Sg	3			
Feb. 13	Pg	1 43 (0)	15	0·5	,,
	Sg	6			
Feb. 13	Pg	1 45 (0)	7	0·5	,,
	Sg	8			
Feb. 13	Pg	1 50 (0)	12	0·5	,,
	Sg	7			
Feb. 13	Pg	1 53 (0)	3	0·5	,,
	Sg	8			

Date.	Phase.	G.M.T.	Maximum Amplitude.	Distance.	Remarks.
1931.		h. m. s.	mms.	Deg.	
Feb. 13	Pg	1 55 (0)	20	0·5	ΔT not known.
	Sg	8			
Feb. 13	Pg	2 2 (0)	2	0·5	,,
	Sg	6			
Feb. 13	Pg	2 5 (0)	17	0·5	,,
	Sg	6			
Feb. 13	Pg	2 18 (0)	3	0·5	,,
	Sg	6			
Feb. 13	Pg	2 19 (0)	3	0·5	,,
	Sg	6			
Feb. 13	Pg	3 8 (0)	11	0·4	,,
	Sg	5			
Feb. 13	Pg	8 33 (0)	4	0·5	,,
	Sg	6			
Feb. 13	Pg	9 55 (0)	2	0·6	,,
	Sg	8			
Feb. 13	Pg	11 47 (0)	8	0·5	,,
	Sg	6			
Feb. 13	Pg	16 26 (0)	2	>0·1	,,
	Sg	0			
Feb. 13	Pg	21 50 (0)	10	0·5	,,
	Sg	6			
Feb. 13	Pg	23 3 (0)	9	0·5	,,
	Sg	6			
Feb. 14	Pg	2 47 (0)	6	>0·1	,,
	Sg	0			
Feb. 15	Pg	4 44 (0)	9	0·5	,,
	Sg	7			
Feb. 15	Pg	4 57 (0)	3	0·7	,,
	Sg	10			
Feb. 15	Pg	10 10 (0)	2	0·3	,,
	Sg	4			
Feb. 15	Pg	14 2 (0)	2	>0·1	,,
	Sg	0			
Feb. 16	Pg	1 23 (0)	2	0·3	,,
	Sg	4			
Feb. 16	Pg	3 5 (0)	5	0·5	,,
	Sg	6			
Feb. 16	Pg	5 9 (0)	12	0·2	,,
	Sg	2			
Feb. 16	Pg	21 27 (0)	3	0·4	,,
	Sg	6			

Date.	Phase.	G.M.T.	Maximum Amplitude.	Distance.	Remarks.
1931.		h. m. s.	mms.	Deg.	
Feb. 17	Pg	0 37 (0)	4	0·2	ΔT not known.
	Sg	3			
Feb. 17	Pg	5 55 (0)	1	0·6	,,
	Sg	8			
Feb. 17	Pg	14 14 (0)	1	0·5	,,
	Sg	7			
Feb. 17	Pg	17 42 (0)	3	0·5	,,
	Sg	7			
Feb. 18	Pg	7 43 (0)	23	0·2	,,
	Sg	3			
Feb. 18	Pg	8 34 (0)	5	0·5	,,
	Sg	7			
Feb. 18	Pg	21 43 (0)	2	0·5	,,
	Sg	7			
Feb. 18	Pg	21 57 (0)	2	>0·1	,,
	Sg	0			
Feb. 18	Pg	22 37 (0)	12	0·1	,,
	Sg	2			
Feb. 19	Pg	2 13 (0)	2	0·7	,,
	Sg	10			
Feb. 19	Pg	2 24 (0)	2	0·3	,,
	Sg	5			
Feb. 19	Pg	8 44 (0)	2	0·3	,,
	Sg	4			
Feb. 19	Pg	16 14 (0)	3	0·3	,,
	Sg	4			
Feb. 20	Pg	13 54 (0)	40+	0·5	,,
	Sg	5			
Feb. 20	Pg	17 14 (0)	2	0·3	,,
	Sg	4			
Feb. 20	Pg	17 58 (0)	2	0·1	,,
	Sg	2			
Feb. 20	Pg	18 37 (0)	2	0·2	,,
	Sg	3			
Feb. 20	Pg	23 47 (0)	3	0·2	,,
	Sg	3			
Feb. 21	Pg	0 22 (0)	3	0·5	,,
	Sg	6			
Feb. 22	Pg	5 2 (0)	1	0·3	,,
	Sg	4			
Feb. 22	Pg	19 2 (0)	3	0·3	,,
	Sg	4			

Date.	Phase.	G.M.T.	Maximum Amplitude.	Distance.	Remarks.
1931.		h. m. s.	mms.	Deg.	
Feb. 23	Pg	4 10 (0)	3	0·3	ΔT not known.
	Sg	4			
Feb. 23	Pg	4 23 (0)	3	0·3	,,
	Sg	4			
Feb. 23	Pg	12 21 (0)	2	0·4	,,
	Sg	5			
Feb. 24	Pg	8 26 (0)	28	0·5	,,
	Sg	7			
Feb. 24	Pg	23 43 (0)	40+	0·7	,,
	Sg	9			
Feb. 25	Pg	1 3 (0)	3	0·4	,,
	Sg	5			
Feb. 25	Pg	8 30 (0)	6	0·6	,,
	Sg	8			
Feb. 26	Pg	9 21 (0)	4	0·6	,,
	Sg	8			
Feb. 26	Pg	19 25 (0)	2	0·4	,,
	Sg	5			
Feb. 27	Pg	12 23 (0)	2	0·2	,,
	Sg	3			
Feb. 28	Pg	1 32 (0)	3	0·2	,,
	Sg	3			
Feb. 28	Pg	16 47 (0)	5	0·7	,,
	Sg	9			
Feb. 28	Pg	18 31 (0)	3	0·5	,,
	Sg	6			

New Plymouth.

LATITUDE : 39° 5′ S. LONGITUDE : 174° 4′ E.

INSTRUMENT : Wood-Anderson short-period Seismograph ; Magnetic damping ; N.–S. component.

Observer : Mr. McCARE, Chief Draftsman, Lands and Survey Department, New Plymouth.

NOTE.—Throughout the report for this station, the G.M.T. is only approximate, as the clock correction is not known.

Date.	Phase.	G.M.T.	Period.	Amplitude.	Distance.	Remarks.
1931.		h. m. s.	Secs.	mms.	Deg.	
Feb. 7	P	10 8 (35)	..	..	2·3	ΔT not known.
	P*	42				
	Pg	48				
	S	9 4	1	42		
	Sg	25				
Feb. 7	P	13 41 (40)	..	..	2·5	,,
	P*	48				
	S	42 11	1	6		
	S* (?)	26				
Feb. 8	P	7 21 (30)	..	..	2·6	,,
	Pq	34				
	Pg	45				
	S	22 2				
	Sg	20	1	22		
Feb. 9	P	11 54 (0)	..	..	2·3	,,
	Pq	4				
	P*	8				
	Pg	17				
	S	28				
	S*	42	1	33		
	Sg	54				
Feb. 9	P	16 30 (0)	..	..	2·3	,,
	P*	8				
	Pg	17				
	S	28				
	S*	37	1	24		
	Sg	44				
Feb. 9	P	20 14 (0)	..	..	..	,,
	P*	7				
	Pg	16				
	S*	42	1	40		
Feb. 10	P	17 15 (20)	..	..	..	,,
	Pq	24				
	P*	29				
	Pg	41				
	S (?)	16 6				
	S*	13				
	Sg	18	1	60		
Feb. 10	P	17 21 (20)	..	..	2·6	,,
	Pq	24				
	P*	27				
	Pg	34				
	S	52				
	S*	22 2				
	Sg	10	1	32		

Date.	Phase.	G.M.T.	Period.	Amplitude.	Distance.	Remarks.
1931.		h. m. s.	Secs.	mms.	Deg.	
Feb. 13	P	9 26 (0)	..	..	2·7	ΔT not known.
	S	33	1	5		
Feb. 13	P	9 50 (0)	..	..	2·4	„
	Pq	4				
	P*	9				
	Pg	19				
	S	29				
	S*	40	1	23		
	Sg	51				
Feb. 13	P	11 48 (30)	..	..	2·4	„
	Pg	47				
	S	49 0				
	S*	11				
	Sg	24	1	17		
Feb. 13	P	11 56 (0)	..	..	2·3	„
	P*	9				
	Pg	17				
	S	29	1	12		
Feb. 13	P	13 43 (0)	..	..	2·3	„
	P*	8				
	Pg	16				
	Ps	24				
	S	29	1	12		
	S*	38				
	Sg	48				
Feb. 13	P	14 40 (0)	..	..	2·3	„
	P*	7				
	Pg	18				
	S	29	1	11		
	Sg (?)	44				
Feb. 13	P	15 16 (30)	..	..	2·6	„
	Pg	49				
	S	17 2	1	4		
Feb. 13	Pg	17 7 (0)	..	..	0·2	„
	Sg	3				
Feb. 13	P	20 58 (30)	..	..	2·4	„
	Pg	48				
	S	59 0				
	S*	11				
	Sg	27	1	18		
Feb. 13	P	22 8 (0)	..	..	2·3	„
	Pq	5				
	P*	8				
	Pg	18				
	S	29				
	S*	38	1	36		
	Sg	57				
Feb. 14	P	2 3 (0)	..	..	2·3	„
	S	28	1	4		

Date.	Phase.	G.M.T.	Period.	Amplitude.	Distance.	Remarks.
1931.		h. m. s.	Secs.	mms.	Deg.	
Feb. 14	P	2 20 (40)	..	..	2·6	ΔT not known.
	Pq	44				
	P*	50				
	Pg	58				
	Ps	21 8				
	S	12				
	S*	25	1	8		
	Sg	35				
Feb. 14	P	3 16 (0)	..	..	2·4	„
	S	30	1	3		
Feb. 14	P	11 14 (0)	..	..	2·4	„
	Pg	16				
	S	30	1	4		
	S*	40				
Feb. 14	Pg	11 40 (0)	..	..	1·3	„
	Sg	16	1	5		
Feb. 14	Pg	13 35 (0)	..	..	0·2	„
	Sg	3	<1	9		
Feb. 14	P	14 55 (30)	..	..	2·4	„
	Pg	44				
	S	56 0				
	S*	13	1	7		
	Sg	22				
Feb. 15	P	6 6 (20)	..	..	2·3	„
	Pq	24				
	P*	28				
	S	48				
	S*	7 2	1	22		
	Sg	10				
Feb. 15	P	9 5 (0)	..	..	2·4	„
	P*	11				
	S	30	1	14		
	S*	42				
Feb. 15	P	21 34 (0)	..	..	2·4	„
	Pg	15				
	S	30				
	S*	42	1	8		
	Sg	54				
Feb. 16	P	11 49 (0)	..	..	2·3	„
	Pq	3				
	S	28	<1	56		
	S* (?)	43				
	Sg	54				
Feb. 16	Pg	13 36 (0)	..	..	0·1	„
	Sg	2	<1	22		
Feb. 16	P	18 40 (0)	..	..	2·3	„
	Pg	14				
	S	29				
	S*	43	1	7		

Date.	Phase.	G.M.T.	Period.	Amplitude.	Distance.	Remarks.
1931.		h. m. s.	Secs.	mms.	Deg.	
Feb. 17	P	17 5 (0)	..	..	2·3	ΔT not known.
	Pq	4				
	S	28				
	S*	37				
	Sg	48	1	10		
Feb. 18	P	7 43 (40)	..	..	2·7	„
	Pq	45				
	P*	50				
	Pg	44 2				
	Ps	7				
	S	13				
	Sg	32	1	24		
Feb. 18	P	14 54 (0)	..	..	2·4	„
	Pg	14				
	Ps	24				
	S	30	1	16		
Feb. 18	Pg	20 31 (0)	..	..	0·2	„
	Sg	3	<1	63		
Feb. 19	P	2 13 (0)	..	..	2·3	„
	Pq	5				
	S	29				
	S*	43	1	13		
Feb. 19	P	6 40 (0)	..	..	2·4	„
	Pq	4				
	P*	7				
	Pg	19				
	S	30	1	7		
	Sg	49				
Feb. 19	Pg	7 15 (0)	..	..	0·1	„
	Sg	2				
Feb. 19	P	8 44 (0)	..	..	2·5	„
	Ps	22				
	S	31	1	6		
Feb. 19	Pg	9 19 (0)	..	..	0·1	„
	Sg	2				
Feb. 19	P	20 47 (0)	..	..	2·3	„
	Pg	15				
	S	28	1	4		
Feb. 20	P	13 58 (0)	..	..	..	„
	Pq	4				
	P*	10				
	Pg	18	<1	73		
	Ps	26				
Feb. 20	P	15 6 (30)	..	..	2·4	„
	Pg	46				
	S	7 0				
	S*	14	<1	30		
	Sg	22				
Feb. 25	Pg	19 30 (0)	..	..	0·2	„
	Sg	3	<1	15		

Date.	Phase.	G.M T.	Period.	Amplitude.	Distance.	Remarks.
1931.		h. m. s.	Secs.	mms.	Deg.	
Feb. 26	P	3 6 (30)	..	..	2·2	ΔT not known.
	Pg	43				
	S	57				
	S*	7 8	1	32		
	Sg	15				
Feb. 26	P	18 49 (30)	..	..	..	„
	Pq	34				
	P*	40				
	Pg	48	<1	70+		
Feb. 27	Pg	4 8 (0)	..	..	0·2	„
	Sg	3	<1	12		
Feb. 27	Pg	17 19 (0)	..	..	0·1	„
	Sg	2	<1	50		
Feb. 28	Sg	5 40 (0)	..	..	..	Local. ΔT not known.
Feb. 28	Sg	10 10 —	..	..	..	„

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