

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR FEBRUARY, 19 51

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: (I) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE" (LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T. 1. sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ^2 .	$\frac{Ah}{wI}$ sec. ⁻¹
N.	22 July 1949	21.6	23.2	- 0.06	52.1
E.	22 April 1949	17.8	18.3	+ 0.04	70.8
Z.	20 May 1949	14.2	12.5	- 0.05	133.

(II) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV).

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD. sec.	AMPLI- TUDE. μ	Δ km.	REMARKS.	
			h.	m.	s.					
8	NE	e	12	00	25			Confused by microseisms.		
	ZNE	eL		05	-					
		F	13	00	-					
9	NE	e	15	10	-			Small. Microseisms.		
		F		40	-					
10	N	e	04	10	24			Confused by microseisms.		
	ZNE	eL		55	-					
		F	06	00	-					
10	ZV,	i	08	50	20			Doubtful on Galitzins. Microseisms.		
		F		55	-					
12	NE	e	04	10	-			Small.		
		F		35	-					
✓ 12	ZV,Z	iP	17	32	05		5,460	e, NE. 66°N., 136°E. Near Verkhoianski Mountains, Siberia. (U.S.C.G.S.).		
	ZV,Z	ePP		34	12					
	Z	ePPP		35	46					
	ZNE	eS		40	06					
	NE	e(SKS)		41	54					
	N	eSS		44	26					
	NE	eSSS		46	42					
	ZNE	eL		49	-					
	E	M		56	27				23	-19
	N	M	18	01	06				20	-19
Z	M		04	42	14	-12				
	F	19	30	-						

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FEBRUARY, 19 51

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI-TUDE.	Δ	REMARKS.	
			h.	m.	s.					sec.
13	NE	e	01	10	58					
	ZNE	eL F		40	-					
13	ZNE	e F	02	20	-				Small.	
	ZNE	e F	07	00	-					
13	ZV,Z	iPKP	12	14	55			(6,000)	e, NE.	
	ZV,Z	ipPKP		15	58				e, NE.	
	ZV,Z	iPP		18	15					
	ZV,Z	epPP		19	07					
	ZN	esPP		19	40				Region of Tonga Islands.	
	ZNE	eSKKS		24	04				15°S, 175°W. (U.S.C.G.S.).	
	NE	e		24	39				Depth about 200 Km.	
	ZNE	eSKSP		28	08					
	NE	eSS		36	34					
	ZNE	eL		50	-					
	N	M F		13 14	20 20	34 -	20	+ 3		
	13/14	ZV,ZNE	iP	22	24	17			8,020	Compression.
ZNE		ep _c P		24	32				Region of Alaska Peninsula.	
ZNE		e		25	00				56°N, 155½°W. (U.S.C.G.S.).	
ZN		iPP		26	57					
ZNE		e(PPP)		29	57					
ZNE		iS		33	40					
ZNE		i(PS)		34	40				Possibly SKS or ScS	
ZNE		e		37	14					
ZNE		eSSS		41	54					
ZNE		eL		45	-					
Z		M		58	06	17		- 65		
N		M		58	31	18		-120		
E		M F		58 03	47 00	18 -		+ 60		
17	ZV,	iPKP	21	25	55			(3,800)	Compression.	
	ZV,	epP		27	50				Z obscured by microseisms.	
	NE	iPKS		29	14				By path >180°.	
	NE	e(PKP)		35	48					
	NE	eSS		45	08				By path >180°.	
	NE	e(SKSP)		47	26				South Eastern New Guinea.	
	NE	eSSS		49	28				7°S., 146°E. (U.S.C.G.S.).	
	ZNE	eL		22	00	-			Depth about 100 Km.	
N	M			11	33	27		- 12		
	M			11	33	27		-16		
	F		23	45	-					
19	ZNE	eL F	23	15	-				Confused by microseisms.	
	ZNE	eL F		50	-					
20	ZNE	eL F	01	35	-				Confused by microseisms.	
	ZNE	eL F	02	05	-					
22	N	e	02	41	41				Confused by microseisms.	
	NE	e		49	45					
	ZNE	eL F		55	-					
	ZNE	eL F	03	45	-					



Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above

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TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

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DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLITUDE.	Δ	REMARKS.
			h.	m.	s.				
1	ZNE	eL F	03 04	48 10	- -				Microseisms.
1	ZV, E	ePKP eSS F	20 21	36 58 15	00 29 -		(16,000)		Small Microseisms.
3	Z	e F	03 04	58 50	33 -				Traces on N and E.
3	ZNE ZNE E	e(PKS) eL M F	12 13	44 05 11 30	45 - 33 -	18	-3		Off Coast of Colima, Mexico. 18°N. 106°W. (U.S.C.G.S.).
3	ZNE	e F	13 14	45 10	- -				
3	ZNE	e F	18	20 55	- -				
5	Z ZNE ZNE	eP eS eL F	01 02	04 14 28 25	38 34 - -		8,640		Near Southern coast of Panama. 7°N., 81°W., Depth about 100 Km. (U.S.C.G.S.).
6	ZV, Z ZE Z E NE	iP esP ePPP iPcS eS	05	26 27 29 31 33	05 09 28 14 09		5,600		Compression. e, NE. Hindu Kush region, northeastern Afghanistan. 36½°N, 70½°E. Depth about 250 Km. (U.S.C.G.S.).



DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLITUDE.	Δ
			h.	m.	s.			
contd.						sec.	μ	km.
6	NE ZNE ZNE E	eSS eSS eL M F	05	34	30			
				37	10			
				40	-			
				47	56	15	-10	
			07	00	-			
6	ZV, ZV, ZE NE ZNE ZNE NE NE NE ZNE E Z N	iP epP ePP iS epS ePS e eSS eL _Q eL _R M M M F	08	03	28			(9,000)
				03	49			
				06	16			
				13	21			
				13	42			
				14	42			
				17	02			
				20	16			
				25	-			
				30	-			
				32	11	23	+25	
				32	13	26	+25	
				32	34	20	+15	
			10	40	-			
6	ZNE	e F	19	30	-			
			20	05	-			
8	ZV, E ZNE	eP e(SKS) eL F	18	45	22			(9,000)
				55	38			
			19	15	-			
				35	-			
9	NE N Z	e(s) e(SS) e F	00	36	09			
				39	40			
				42	30			
				50	-			
9	NE	e F	02	00	-			
				30	-			
9	NE	e F	09	55	-			
			10	15	-			
10	ZNE	e F	09	45	-			
			10	10	-			
10	ZNE	e F	20	40	-			
			21	30	-			
14	ZNE	e F	11	40	-			
			12	45	-			
14/15	-	-	-	-	-			Time marks failed. 13h. 43m. to 09h. 30m.
15	ZNE	e F	11	45	-			Small.
			12	00	-			
16	ZNE ZNE ZNE	e e e(L) F	01	19	06			Small.
				21	20			
				21	58			
				30	-			



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DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
✓ 18	N	e(PS)	21	38	21	24	-4	Microseisms.	
	NE	e(SSS)		55	42				
	ZNE	eL	22	00	-				
	N	M		02	45				
		F		55	-				
21	ZV,NE	e	19	02	35			Microseisms.	
		F		10	-				
22	ZV,	i PP	12	28	05	15	+10	(13000)	
	ZV,	i		28	15				
	NE	e PPP		29	31				
	NE	e PS		37	43				
	NE	e PPS		38	40				
	ZNE	eL		55	-				
	N	M	13	05	50				
		F		50	-				
✓ 23	ZV,	ePP	07	23	46	20	-6		
	NE	ePS		36	00				
	NE	eSS		42	16				
	ZNE	eL	08	00	-				
	E	M		14	53				
		F	09	15	-				
24	N	ePP	05	18	34	20	-3		
	NE	eSKS		24	43				
	NE	e		42	52				
	ZNE	eL		48	-				
	N	M		50	28				
		F	06	40	-				
24	NE	e	07	48	02				
	ZNE	eL		57	-				
		F	08	30	-				
25	N	e(PPP)	16	58	52				
	E	e(PS)	17	04	51				
	ZNE	eL		22	-				
		F	18	00	-				
26	ZNE	eL	04	22	-			Microseisms.	
		F		50	-				
✓ 28	ZNE	eL	14	10	-	19	+4		
	N	M	15	16	09				
		F		50	-				
29	NE	e	06	05	13				
	ZNE	eL		15	-				
		F	07	00	-				
30/31	ZV,	iP	23	13	45			3,315	
	ZV,	e		13	52				
	ZV,	ePP		14	57				
	ZNE	eS		18	42				
	ZNE	e		19	24				
	ZNE	eSS		19	44				
	ZNE	e(L)		21	30				

(contd.)



SEISMOLOGICAL BULLETIN.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
contd. 30/31	N	M	23	24	45	27	-18		
	N	M		31	36	29	-20		
		F	00	10	-				
31	NE	e F	12	05 25	- -				Small.

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From the ISC collection scanned by SISMO5

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			h.	m.	s.				
23	ZNE	eL F	03	35	-				
				55	-				
23	ZNE	e F	12 13	25 00	- -				Small.
25	NE ZNE	e eL F	13 14	27 40 00	16 - -				Small.

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DATE.	COMPT.	PHASE.	G.M.T.			PERIOD. sec.	AMPLI- TITUDE. μ	Δ km.	REMARKS.		
			h.	m.	s.						
2	ZV,	iP	01	37	27	18	+ 3	2,520	e, ZE. North Atlantic Ocean 53°N, 35°W. (U.S.C.G.S).		
	ZV,	iPP								37	41
	ZNE	iS								41	28
	ZV,	eSS								42	30
	ZNE	eL								43	-
	E	M								44	49
2	ZNE	F	02	10	-						
		e	05	52 (15)							
2	NE	F	06	05							
		e	21	50	-			Small.			
4	ZV,	F	22	10	-						
		iP	11	30	31			10,300	Near Southern Peru. 16°S, 74°W. Depth about 150 Km. (U.S.C.G.S).		
NE	eS	41	32								
4	ZNE	N	12	00	-						
		ZNE	eL	12	00	-					
4	ZNE	E	12	00	-						
		M	07	08			22	+ 2			
4	ZNE	F	25	-							
		e	16	10	-				Small.		
5	ZV, Z	F	16	25	-						
		iP	20	24	22			9,700	Dilatation.		
5	ZV, Z	epP	25	06							
		ZV, ZNE	iPP	27	53						
5	ZV, ZNE	ipPP	28	32							
		NE	eSKS	34	34				Ryukyu Islands. 29°N, 128°E. Depth about 150 Km. (U.S.C.G.S).		
5	ZNE	eS	35	38							
		ePS	37	02							

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MARCH

19 51

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
contd.									
✓ 5	ZNE	eSS	20	41	58				
	NE	eSSS		46	46				
	ZNE	eL		55	-				
	N	M	21	10	06	17	- 7		
		F	22	05	-				
6	ZNE	e	19	35	-				
		F		55	-				
7	ZNE	e	19	22	-				Small.
		F		55	-				
✓ 9	ZV,Z	ePP	20	04	36			(12,900)	Flores Sea region.
	ZNE	ePS		14	24				8°S, 124½°E. (U.S.C.G.S).
	NE	ePPS		15	22				
	NE	e		16	24				
	ZNE	eSS		20	40				
	NE	eSSS		27	04				
	NE	eLQ		34	-				
	ZNE	eLR		42	-				
	N	M		44	03	36	+ 35		
	E	M		53	07	24	+ 13		
		F	22	45	-				
10	ZV,ZNE	eP	10	41	58			1,640	South-central Spain.
	NE	eS		44	42				38°N, 05°W. (U.S.C.G.S).
	ZNE	eL		45	-				
	N	M		46	37	16	- 3		
		F	11	05	-				
10/11	-	-	-	-	-				10a. 20h. 50m. to 11d. 09h. 38m. Drums not traversing.
12	ZV,Z	iP	15	03	40			(6,180)	Dilatation.
	ZV,	i		04	02				
	NE	eS		11	25				
	NE	eScS		12	59				
	ZNE	eL		27	-				
	E	M		38	22	14	- 3		
		F	16	05	-				
14	ZV,	iPn	09	48	07			500	Felt in West central Germany.
	ZV,ZE	iPg		48	22				50° 40'N. 06° 50'E.
	ZN	iSn		49	00				(Strasbourg).
	ZNE	iS*		49	10				
	ZNE	iSg		49	20				
	N	M		49	26	11	+ 40		
		F	10	15	-				
16	ZNE	eL	14	34	-				
		F		55	-				
✓ 17	ZV,ZE	eP	04	38	51			8,040	
	NE	eS		48	15				
	NE	ePS		48	59				
	NE	eSSS		56	18				
	ZNE	eL	05	05	-				
	N	M		07	46	22	- 9		

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			h.	m.	s.				
contd.						sec.	μ	km.	
17	E Z	M M F	05	08	07	17	+ 4		
				13	29	13	- 5		
				55	-				
18	ZNE	e F	10	15	-				Microseisms.
				30	-				
19	ZNE	eL F	03	20	-				Microseisms.
				40	-				
19	NE ZNE N	e eL M F	09 10	51 12	45 -	17	+ 2		
				16	28				
				45	-				
19	NE ZNE N	ePS eL M F	20 21	49 10	46 -	15	+ 3		Northern Kamchatka 57°N, 160°E. (U.S.C.G.S.).
				17	12				
				22	00				
21	ZNE	e F	19 20	05 00	- -				
22	NE	e F	17 18	40 05	- -				Microseisms.
23	ZV,Z ZV,Z ZV,ZNE ZNE ZNE ZNE NE ZNE N	1PKP ₁ 1PKP ₂ ePP eSKSP eSS eSSP e eL M F	21 22	58 59 02 12 14 16 24 28 30	22 03 44 56 22 14 01 -	22	- 6	(18,500)	Microseisms. e, NE. Phases doubtful.
				35	-				
			23	50	-				
24	NE	e F	21	20	-				
				55	-				
28	ZNE	e F	02	20	-				Small.
				55	-				
29	ZNE E	eL M F	11	07	-	23	- 2		
				10	52				
				30	-				

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			h.	m.	s.								
✓ 2	Z	eP	00	25	47	21	+3	(9,000)	Microseisms. Off coast of El Salvador 13°N, 90°W. (U.S.C.G.S).				
	E	e(S)		36	47								
	Z	ePS		37	42								
	NE	eSS		44	09								
	ZNE	eL		50	-								
	E	M	01	01	07								
	F		40	-									
✓ 2	ZV,	e(PP)	22	31	17	26	+4		Near west coast of New Britain 6°S, 149°E. (U.S.C.G.S).				
	ZV,	e		31	51								
	ZNE	eL		10	-								
	N	M	23	21	07								
		F		50	-								
	5	ZV,	eP	03	19					57	17	-7	2,320
Z		e		22	12								
ZV,ZNE		eS		23	42								
N		eSS		24	44								
ZNE		eL		26	-								
N		M	04	27	29								
	F		00	-									
6	ZNE	e	02	10	-								
	F		30	-									
6	ZNE	e	20	38	-								
	F		50	-									
7	ZNE	e	00	33	-								
	F		50	-									

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APRIL, 19 51

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.	
			h.	m.	s.					sec.
✓ 8	ZV, Z	eP	21	44	14			3,910	Near south-central coast of Turkey 37°N, 35°E. Depth about 100 Km. (U.S.C.G.S).	
	ZV, Z	iPP		45	27					
	ZV, Z	eP _c P		46	27					
	NE	eS		49	47					
	ZNE	eSS		51	45					
	ZNE	eL		54	-					
	N	M		55	58	17	+5			
	Z	M		57	48	14	-3			
		F	22	45	-					
9	ZNE	e	17	40	-			Microseisms.		
		F	18	00	-					
10	ZNE	e	00	07	-			Microseisms.		
		F		20	-					
✓ 10	Z	e(PKP)	11	18	41			+5		
	Z	e		20	11					
	ZNE	eL	12	00	-					
	N	M		15	10	19				
		F	13	15	-					
11	ZNE	e	05	08	-					
		F		30	-					
11	ENE	e	20	22	-					
		F		55	-					
✓ 13	NE	eLq	11	11	-			-5		
	ZNE	eLr		20	-					
	N	M		25	13	23				
		F	12	00	-					
14	ZV, Z	iP	00	58	25			(10,500)	Northern Argentina 24°S, 66½°W. Depth about 250 Km. (U.S.C.G.S).	
	ZV, Z	iPP		59	12					
	ZNE	iSKS	01	08	43					
	ZNE	e(S)		09	19					
	ZNE	eSP		10	43					
	ZNE	eL		30	-					
		F	02	15	-					
✓ 14	ZV, Z	iP	04	19	01			5,530	Dilatation.	
	ZV, Z	i		19	23					
	NE	eS		26	15					
	NE	eSS		30	00					
	ZNE	eL		35	-					
	N	M		42	50	16	-13			
	E	M		42	55	16	+12			
	Z	M		44	22	15	-11			
				05	15	-				
				05	20	-				
14	ZNE	e		35	-					
		F			-					
✓ 14	ZV, Z	eP	13	43	25			6,945	Microseisms. Eastern Siberia. 61°N, 136°E. (U.S.C.G.S).	
	NE	eS		51	56					
	NE	eSKS		53	22					
	ZNE	eL	14	00	-					
	E	M		10	28	18	+50			

SEISMOLOGICAL BULLETIN.

APRIL, 1951

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
(contd)									
✓ 14	Z	M	14	11	42	18	-19		
	N	M		13	41	15	-50		
		F	15	55	-				
✓ 14/15	ZV,	iP	23	52	10			7,830	Dilatation. e,Z.
	ZV,	i		52	42				
	NE	eS	00	01	23				
	NE	ePS		02	19				
	NE	eSSS		09	11				
	ZNE	eL		18	-				
	E	M		26	49	15	-16		
	Z	M		27	57	12	-12		
		F	01	20	-				
20	ZNE	e	04	23	43				Microseisms.
	ZNE	eL		26	-				
		F		40	-				
21	ZV,	e	23	14	59				Local.
	ZV,	e		15	49				Not shown on Galitzins.
		F		19	-				
✓ 22	ZV,Z	iPP	03	49	01				Dilatation.
	NE	ePS		58	20				
	NE	e(SSS)	04	12	06				
	ZNE	eL		17	-				
	N	M		22	44	17	+3		
		F		45	-				
22	Z	e(P)	12	48	36				
	ZNE	eL		55	-				
	N	M		58	38	17	+4		
		F	13	20	-				
22	NE	e	21	27	-				Small.
		F		55	-				
23	ZV,Z	ePKP	01	10	20				
	ZV,Z	eSKS		17	52				
	NE	eSKKS		19	44				
	ZNE	eL		42	-				
		F	02	15	-				
23	Z	ePKP	07	10	48				Phases doubtful.
	Z	ePPP		19	28				> 180°.
	NE	eSKKS		25	25				
	NE	e		25	53				
	ZNE	eL	08	10	-				
		F	09	10	-				
23	ZNE	e	12	50	-				Small.
		F	13	20	-				
24	ZV,	e	23	15	46				Local.
		F		18	-				Not shown on Galitzins.
28	ZNE	e	22	30	-				
		F		55	-				

SEISMOLOGICAL BULLETIN.

APRIL,

19 51

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
29	ZNE	eL F	08	02	-				
				35	-				
29	ZNE	e F	19	10	-				Small.
				20	-				
29	ZNE	e F	22	10	-				Small.
				50	-				
30	ZV,Z	ePKP	15	47	32			(15,000)	
	ZV,Z	iPP		49	50				
	ZNE	iPKS		50	50				
	Z	iPPP		52	42				
	ZNE	iSKSP	16	00	00				
	NE	ePS		01	10				
	NE	ePPS		02	10				
	NE	eSS		07	22				
	NE	eLQ		26	-				
	ZNE	eLR		33	-				
	N	M		36	18	25	-19		
	E	M		36	41	23	+10		
	Z	M		40	05	24	+8		
		F	18	55	-				



KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR MAY, 1951

Lat. 51° 28' 8" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION : RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS : (I) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS : FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T ₁ sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ ² .	$\frac{Ak}{\pi l}$ sec. ⁻¹
N.	22 July 1949	21.6	23.2	- 0.06	52.1
E.	22 April 1949	17.8	18.3	+ 0.04	70.8
Z.	20 May 1949	14.2	12.5	- 0.05	133.

(II) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV.).

TIME SERVICE : MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLITUDE.	Δ	REMARKS.		
			h.	m.	s.						
1	ZV,Z	iPKP 1	05	22	41			(17500)	e,E. South of Tasmania 50½°S, 149°E. (U.S.C.G.S).		
	ZE	iPKP 2		22	48						
	ZV,ZNE	iPP		27	08						
	Z	eSKS		29	08						
	ZE	eSKKS		33	02						
	NE	eSS	47	14							
	NE	ePSS		48	12						
	NE	eSSS		53	36						
	ZNE	eL	06	08	-						
	N	M		21	03					38	+30
	E	M		22	13					38	+40
1	ZNE	e	23	15	-						
		F		55	-						
2	Z	e	16	37	48						
	ZNE	eL	17	05	-						
		F	18	30	-						
4	Z	iP	12	04	49			8,410			
	Z	i		05	49						
	Z	iPP		08	47						
	ZNE	iS		14	33						
	ZNE	eL		25	-						
4		F	13	10	-						
	ZNE	e(P)	19	36	27						
	ZNE	e(S)		44	00						
	ZNE	eL		50	-						
	F		20	25	-			(5970)			

SEISMOLOGICAL BULLETIN.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
6	ZNE	e F	22	30	-				Small.
6 / 7	ZV, ZV, ZNE E	iP iPPP eL M F	23	15	23				
				19	54				
				35	-				
				48	17	18	- 5		
			00	40	-				
7	ZNE	e F	20	50	-				Small.
			21	30	-				
8	ZNE	e	19	20	-				Small.
				40	-				
8	ZNE	e F	20	45	-				Small.
			21	15	-				
10	Z ZNE	iP eL	09	30	27				Dilatation. Disturbed 09h. 38m. to 09h. 42m.
	N Z	M M F	10	09	20	14	+ 9		
				09	29	13	- 6		
			11	15	-				
10	ZNE	e F	22	20	-				
				30	-				
11	ZNE	e F	03	55	-				Small.
			04	10	-				
12	ZV, NE ZNE ZNE N	e(P) e(S) e eL M F	22	15	04			(7390)	Doubtful.
				23	54				
				27	22				
				33	-				
				36	36	22	- 2		
			23	15	-				
14	ZV, ZNE N	eP eL M F	04	17	06				
				30	-				
				30	06	22	- 3		
			05	40	-				
15	ZV,Z Z NE NE NE ZNE	eP ePP e eSKS ePPS eL F	05	31	54			(11,500)	
				35	38				
				41	02				
				42	26				
				45	06				
			16	00	-				
			17	20	-				
15	ZV,ZN ZV,Z ZV,Z ZV,Z ZV,ZNE ZV,ZNE	eP i(P*) i(Pg) i(S) e(S*) e(Sg) F	22	56	39			(900)	NE,e. NE,e. NE,e.
				57	09				
				57	38				
				57	54				
				58	14				
				58	30				
			23	10	-				

SEISMOLOGICAL BULLETIN.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
15/16	ZNE	e F	23	50	-				Small.
			00	05	-				
16	ZNE	e F	01	10	-				Small.
				30	-				
16	ZV,Z	eP	02	29	10				Small.
	ZV,	e		29	40				
	ZV,ZE	e		30	10				
		F		40	-				
16	Z	e	14	34	38				
	ZNE	eL		57	-				
		F	15	40	-				
17	Z	e F	02	01	20				Deep focus.
				20	-				
19	Z	eP	15	57	10			1350	South central Spain,
	NE	ePP		57	55				38°N, 4°W. (U.S.C.G.S).
	ZNE	eS		59	15				
	ZNE	eSS	16	00	30				
	ZNE	e(L)		02	-				
	E	M		02	22	18	- 16		
		F		50	-				
20	NE	e F	15	20	-				Small. possibly not seismic.
			16	10	-				
20	NE	e F	19	55	-				Small.
			20	35	-				
✓ 21	NE	e	08	54	14				Changing Charts.
	ZNE	eL	09	27	-				
	N	M		37	22	23	- 4		
		F	11	10	-				
22	ZNE	e F	18	25	-				Small.
				55	-				
25	ZNE	e F	20	45	-				Small.
			21	00	-				
26	ZNE	e F	11	15	-				
				35	-				
26	ZNE	e F	22	15	-				Small.
				30	-				
27	ZNE	e F	21	50	-				Small.
			22	00	-				
28	ZV,	i F	01	55	39				Possibly not seismic.
				56	-				
✓ 28	ZNE	iP	16	10	12				
	ZNE	eL		31	-				
	N	M		36	53	25	+ 6		
		F	17	05	-				

SEISMOLOGICAL BULLETIN.



From the ISC collection scanned by SISMO5

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
29	ZNE	e F	03	45	-				Small.
				55	-				
29	ZV,Z	e P	06	23	42			(8,500)	
	ZV,Z	e PP		26	17				
	ZE	e (S)		33	30				
	ZNE	eL		41	-				
	E	M	07	14	46	24	- 7		
		F	09	00	-				
30	ZNE	e F	13	50	-				Small.
			14	10	-				
30	Z	e (P)	20	15	30			(13,000)	
	ZNE	e		16	38				
	ZNE	e (SKS)		26	15				
	ZNE	eL		50	-				
	Z	M	21	11	14	18	- 2		
		F	22	25	-				
31	ZNE	e PKP	21	09	07			(12,500)	
	ZV,ZNE	e		12	55				
	ZNE	iPPP		13	15				
	NE	iSKS		19	36				
	ZNE	iPS		20	09				
	Z	ePPS		21	19				
	ZNE	e		21	32				
	NE	eSS		26	59				
	ZNE	eL		40	-				
	N	M		55	35	18	- 11		
		F	23	05	-				

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR JUNE 1951

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: (i) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T. sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ^2 .	$\frac{Ak}{\pi I}$ sec. ⁻¹
N.	22 July 1949	21.6	23.2	-0.06	52.1
E.	22 April 1949	17.8	18.3	+0.04	70.8
Z.	20 May 1949	14.2	12.5	-0.05	133.

(ii) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV.).

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.	PERIOD.	AMPLITUDE.	Δ	REMARKS.
✓ 2	Z ZNE NE ZNE N	ePKP eSKS eS eL M F	07 05 41 12 27 13 19 35 - 09 15 -	18	μ -4	(11,200)	Near North Coast of Borneo 7°N, 117°E. (U.S.C.G.S.)
✓ 3	ZNE e	eL M F	19 15 - 28 56 50 -	16	-1		
5	ZNE	e F	02 10 - 50 -				Small
5	ZNE	e F	03 40 - 04 15 -				
✓ 5	ZV,ZNE ZV,ZNE ZV,ZNE NE NE ZNE NE Z E N Z	iP e ePP iSKS eS ePS eL _q eL _R M M M F	17 10 33 10 45 14 16 20 59 21 36 22 09 39 - 45 - 50 07 55 37 55 38 21 30	22 17 17	-80 -53 +40	(10,000)	Compression. South of Kyushu, Japan. 30°N. 132°E. Depth about 100 Km. (U.S.C.G.S.)

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.
SEISMOLOGICAL BULLETIN.

JUNE

1951

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.		
			h.	m.	s.						
✓ 6	ZV,ZNE	iP	16	15	26	sec.	"	2,430	Compression Jan Mayen Island 71½°N, 8°W. Depth about 60 Km. (U.S.C.G.S.)		
	ZV,ZNE	iPP		15	43						
	ZNE	ePPP		16	45						
	ZNE	iS		19	20						
	ZNE	iSS		19	41						
	ZNE	eL		21	-						
	E	M		22	53					15	-55
	N	M		23	15					15	+55
	Z	M		25	53					12	-45
7	ZNE	eL ₂	18	55	-				Via Antipodes		
		F	20	15	-						
7	ZNE	e	12	35	-						
		F	13	00	-						
7/8	ZNE	ePKP	23	19	28			(17,000)	Kermadec Islands Region 27½°S, 176°W. (U.S.C.G.S.)		
	ZNE	e		25	14						
	NE	eSS		42	55						
	NE	eSSS		51	11						
	ZNE	eL	00	20	-					18	+3
	N	M		28	49						
9	ZV,Z	iP	11	29	46			4,540	Western Iran. (U.S.C.G.S.)		
		ePP		31	27						
		eS		35	56						
		ePS		36	07						
		eSS		38	55						
		eL		42	-						
		M		50	21					18	+2
		F		12	40					-	
		10	ZNE	e	00					55	-
F	01			35	-						
10	ZNE	e	09	11	02						
	ZNE	eL		15	-						
	N	M		27	53					24	+3
15	ZNE	e	22	00	-				Small		
		F		15	-						
16	ZNE	e	16	55	-				Small		
		F	17	10	-						
17	ZV,Z	e	00	10	00						
		eL		25	-						
		F		50	-						
17	ZV, ZNE	e	10	16	(00)				Possibly microseismic.		
		e		20	-						
		F		50	-						
18	ZNE	e	07	45	-				Small		
		F	08	00	-						
18	ZNE	eL	17	30	-				Small		
		F	18	30	-						

SEISMOLOGICAL BULLETIN.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI-TUDE.	Δ	REMARKS.
			h.	m.	s.				
19	ZNE	e F	17 18	55 00	- -				Small
20	ZNE N	eL M F	22 23	35 48 25	- 01 -	15	+3		
20/21	ZNE	e F	23 00	35 25	- -				Small
21	ZNE	e F	00 01	40 30	- -				Small
24	Z ZNE	e(P) eL F	05 06	06 55 35	44 - -				Small
24	Z ZNE NE ZNE	ePP ePS ePPS eL F	11 12	14 23 24 55 35	04 20 12 - -			(11,000)	Marianne Islands 19°N, 146.5°E. (U.S.C.G.S.)
24	ZNE	e F	17 18	50 15	- -				
25	ZNE	e F	03 04	55 55	- -				Small
25	ZNE ZNE	e eL F	05 06	57 10 45	26 - -				
25	Z NE ZNE	eP eSS eL F	16 17	23 37 50 25	20 33 - -				Southern Alaska 61°N, 150°W. (U.S.C.G.S.)
25	ZNE	e F	20 21	55 15	- -				Small
26	ZV,Z ZNE ZNE	e e eL F	04 05	00 09 45 15	29 58 - -				
29	ZNE	e F	22 23	50 15	- -				Small
30	NE	e F	12 13	45 15	- -				Small; possibly not seismic.

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.SEISMOLOGICAL BULLETIN FOR JULY, 1951.

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: (I) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1918).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T. sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ^2 .	$\frac{Ah}{wl}$ sec. ⁻¹
N.	22 July 1949	21.6	23.2	- 0.06	52.1
E.	22 April 1949	17.8	18.3	+ 0.04	70.8
Z.	20 May 1949	14.2	12.5	- 0.05	133.

(II) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV).

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD. sec.	AMPLI- TUDE. μ	Δ km.	REMARKS.
			h.	m.	s.				
2	ZV,	iP	05	29	33			(1,000)	
	Z	ePP		33	58				
	N	eSKS		40	11				
	ZNE	eL		58	-				
	F		06	40	-				
√ 2/3	ZV,ZNE	ePKP	22	06	21	20	- 2	(16,500)	Compression. > 180°. Tonga Islands region. 21°S, 176°W. (U.S.C.G.S).
	ZNE	ePP		09	59				
	ZNE	eSKKS		17	19				
	ZNE	ePPP		20	07				
	ZNE	eSS		28	18				
	ZNE	eL	22	50	-				
	N	M	22	10	18				
F		00	20	-					
3	ZV,ZNE	eP	05	33	11	19	+ 3	6,170	
	ZNE	eS		40	55				
	ZNE	eL		50	-				
	N	M		55	00				
3	ZNE	F	07	05	-				
	F		09	35	-				Small.
3	ZNE		10	30	-				
	F								
3	ZV,Z	iP	18	25	28	19	+ 2	6,180	Compression. eNE.
	Z	ePP		27	40				
	ZNE	iS		33	13				
	ZNE	eL		42	-				
	N	M		47	18				
	F		19	35	-				

SEISMOLOGICAL BULLETIN.

JULY,

19 51

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
(contd) 19	ZNE	ePS	21	04	01				
	ZNE	eSS		08	47				
	ZNE	eSSS		12	13				
	ZNE	eL		20	-				
	E	M		35	26	18	- 2		
		F	22	30	-				
20	ZNE	e	00	35	-				Small.
		F		55	-				
21	ZV,Z	iP	01	43	53			7,980	NE,e.
	ZV,Z	iPcP		44	04				
	Z	ePPP		48	26				
	NE	eS		53	14				
	NE	ePS		53	26				
	NE	e(SKS)		54	01				
	NE	eScS		54	20				
	ZNE	eSS		59	08				
	ZNE	eL	02	10	-				
	N	M		17	59	18	+ 3		
	Z	M		18	36	18	+ 2		
		F	03	00	-				
21	ZV,ZNE	eP	03	32	57				
	ZNE	e(S)		40	55				
	ZNE	e		45	16				
	ZNE	eL		55	-				
		F	04	35	-				
21	ZNE	eL	21	00	-				
		F		25	-				
23	-	-	08 ^{to} 16	01 50	- -				Standardisation of N-S.
23	NE	e	20	55	-				Possibly not seismic.
		F	21	30	-				
25	ZNE	e	17	53	-				
		F	18	20	-				
25	ZNE	e	18	40	-				
		F	19	05	-				
25	ZNE	e	21	20	-				
		F		50	-				
26	-	-	10 ^{to} 16	01 10	- -				Standardisation of E-W.
27	ZNE	e	01	50	-				Small.
		F	03	25	-				
28	ZNE	e	21	45	-				
		F	22	20	-				
28/29	ZV,ZN	iP	23	17	15			9,420	Compression.
	ZV,Z	e		17	27				
	ZNE	eS		27	49				

SEISMOLOGICAL BULLETIN.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
4	ZV,Z	iP	07	26	12				
	ZV,Z	ePP		26	52				
	NE	e(SKS)		33	08				
	ZNE	e (PS)		36	37				
	NE	e		38	57				
	ZNE	eL		55	-				
		F		08	20	-			
5	ZV,Z	eP	09	14	00				
	Z	ePP		17	34				
	NE	eSS		28	32				
	ZNE	eL		35	-				
		F		10	00	-			
8	ZV,ZNE	eP	05	58	16			(11,000)	Phillipine Islands. 11°N, 122°E. (U.S.C.G.S).
	ZV,ZNE	ePP	06	02	26				
	ZV,ZNE	eSKS		08	46				
	ZNE	ePS		11	16				
	NE	eSS		16	46				
	ZNE	eL		32	-				
	E	M		50	54	17	- 15		
	Z	M		51	52	17	+ 15		
	N	M		51	57	17	+ 19		
		F		08	30	-			
	9	ZV,ZNE	iP	00	16	16			
ZV,Z		ePP		19	22				
ZNE		eS		26	20				
ZNE		ePS		27	02				
E		e		27	46				
ZNE		eL		40	-				
E		M		47	37	23	+ 3		
	F		01	35	-				
10/11	ZNE	eL	23	45	-				
	F		00	20	-				
11	ZV,Z	iP	18	34	17			(10,300)	NE, e. Bonin Island region. 28½°N., 139½°E. Depth about 550Km (U.S.C.G.S).
	ZV,Z	iPcP		34	28				
	ZV,Z	ipP		36	12				
	ZV,ZNE	esP		37	00				
	ZV,ZNE	epPP		40	33				
	ZNE	eSKS		44	06				
	NE	iS		44	37				
	ZNE	eSP		45	56				
	ZNE	iSPP		47	51				
	ZNE	esS		48	53				
	ZNE	iSS		51	05				
	ZNE	eL		57	-				
	E	M		19	16	55	18	+ 12	
	Z	M			21	03	19	+ 7	
	N	M			21	13	17	+ 12	
	F		21	30	-				
13	ZE	e	06	56	57				
	ZNE	eL	07	15	-				
		F		35	-				

SEISMOLOGICAL BULLETIN.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLITUDE.	Δ	REMARKS.
			h.	m.	s.				
13	ZV,ZNE	ePKP	20	12	55			(1,000)	Solomon Islands region. Depth about 100 Km. 7°S, 156°E. (U.S.C.G.S).
	ZNE	ePP		15	17				
	ZNE	e		16	13				
	ZNE	ePS		25	11				
	NE	eSS		32	05				
	ZNE	eL		40	-				
	N	M		21	12	12	22	- 5	
	F		22	20	-				
14	ZV,Z	e	06	41	06				Traces on N and E.
	ZNE	e	07	04	01				
	ZNE	e		13	26				
	ZNE	eL		32	-				
	F		-	-	-			Overlapped.	
14	ZN,ZNE	i(P)	07	30	16				Chart changing.
	F		09	45	-				
14	Z	e	10	05	20				Small.
	ZNE	e		07	04				
	NE	e		14	57				
	ZNE	eL		35	-				
	F		11	20	-				
14	ZNE	e	17	55	-				
	F		18	10	-				
15	ZV,ZNE	e	18	47	59				Small.
	ZNE	e		48	54				
	F		19	20	-				
16	Z	e(PKP)	11	01	01			(14,000)	
	ZNE	ePP		02	02				
	ZNE	ePS		11	49				
	ZNE	ePPS		12	51				
	ZNE	e(SSS)		28	09				
	ZNE	eL		30	-				
	N	M		46	47	24	- 4		
	F		13	10	-				
17	NE	e	16	00	-				Possibly not real.
	F			30	-				
18	ZV,ZNE	iP	09	15	50			6,280	Compression. Mid-Atlantic Ocean. 1°N., 27°W. (U.S.C.G.S).
	ZV,Z	i		16	11				
	ZV,ZNE	ePP		17	49				
	ZNE	iS		23	40				
	ZNE	eScS		24	17				
	ZNE	eSS		27	17				
	ZNE	eL		30	-				
	N	M		33	45	15	-130		
	E	M		33	56	15	+ 90		
	Z	M		36	07	13	- 40		
	ZNE	eL2		12	50	-			
	F		13	15	-			Via antipodes.	
19	ZV,Z	iP	20	53	18			8,510	Compression. NE,e.
	ZNE	ePP		56	09				
	NE	eS	21	03	07				



JULY,

1951

SEISMOLOGICAL BULLETIN.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
(contd) 28/29	NE	ePS	23	28	51				
	ZNE	eL		45	-				
	E	M		58	11	16	+ 3		
	N	M F	24 01	00 10	54 -	16	- 3		
29/30	ZV, Z	eP	23	52	35				
	ZNE	e(SKS)	00	02	25				
	ZNE	eL		30	-				
	N	M F		41 02	12 20	25	- 3		
30	-	-	08 ^{to} 16	57 29	-			Adjustments of Z.	
31	-	-	09 ^{to} 16	15 39	-			Adjustments of Z.	
31	ZNE	e F	23	15 40	- -				

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR AUGUST, 19 51

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION : RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS : (I) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS : FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T ₁ sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ ² .	$\frac{Ak}{\pi l}$ sec. ⁻¹
N.	23 July 1951	21.6	23.3	+ 0.05	52.8
E.	26 July 1951	17.4	18.7	+ 0.01	66.7
Z.	2 August 1951	14.1	11.8	+ 0.18	143.

(II) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV).

TIME SERVICE : MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLITUDE.	Δ	REMARKS.
			h.	m.	s.				
1	NE	e F	04	00	-			Small.	
1	-	-	09 to 16	04 to 35	-			Adjustment of Z.	
2	NE	epP	04	01	18		(14,000)	No "Z" record.	
	NE	eSKKS		07	00			New Britain Islands region	
	NE	eSP		10	56			4°S, 154½°E. Depth about	
	NE	eSS		20	00			500 Km. (U.S.C.G.S).	
	NE	eL		30	-				
		F	05	10	-				
2	-	-	09 to 15	05 to 53	-			Standardisation of "Z".	
2	ZNE	e	20	52	02				
	ZNE	eL	21	00	-				
	E	M		17	52	18	+ 2		
		F	22	00	-				
3	ZV,	iP	00	35	53		9,180	No "Z" record.	
	ZV,	ePP		38	57			Near south-east coast of	
	NE	eS		46	15			Nicaragua 13°N, 87½°W.	
	NE	ePS		47	24			Depth about 100 Km.	
	NE	eSS		50	50			(U.S.C.G.S).	
	NE	eL		55	-				
	E	M	01	06	19	18	+ 4		
		F	02	15	-				

KEW OBSERVATORY, RICHMOND, SURRE
SEISMOLOGICAL BULLETIN.

AUGUST, 19 51

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
3	NE	eL	05	55	-				Aftershock. No Z record.
		F	06	55	-				
3	ZNE	e	16	50	-				
		F	17	50	-				
4	ZNE	e	00	02	(52)				
		F		25	-				
4	ZNE	e	00	40	-				
		F	01	05	-				
4	ZNE	e	06	05	-				Small, possibly not seismic.
		F		45	-				
4	ZNE	e	12	10	-				
		F		40	-				
5	ZNE	e	06	42	-				
		F	07	05	-				
5	ZNE	e	16	45	-				Small.
		F	17	20	-				
6	NE	e	08	35	-				No "Z" record.
		F	09	25	-				
6	ZNE	ePP	15	31	55				New Britain Island. 6°S, 152°E. (U.S.C.G.S).
	ZNE	e		33	19				
	ZNE	e		33	56				
	ZNE	e		42	07				
	ZNE	e(SS)		52	07				
	ZNE	eL	16	10	-				
E	M		19	46	29		- 4		
	F		17	15	-				
8	ZV,	iP	20	59	37			2,720	e, ZNE.
	ZV,ZNE	e	21	02	11				
	ZV,Z	e		03	32				
	ZNE	eS		03	54				
	ZNE	eL		05	-				
	E	M		05	26	16		+ 5	
	N	M		05	28	14		- 4	
	Z	M		05	28	16		- 6	
10	ZV,ZNE	eP	05	41	55			6,055	Atlantic Ocean off North Brazil. 8½°N, 40°W. (U.S.C.G.S).
	ZNE	ePP		44	52				
	ZNE	iS		49	33				
	ZNE	eSS		52	52				
	ZNE	eL		56	-				
	E	M		58	58	22		+ 3	
	F		07	50	-				



SEISMOLOGICAL BULLETIN.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.	
			h.	m.	s.					sec.
10/11	ZV,	iP	23	11	48			8,700	Off north coast of Hokkaido Japan. 46°N, 143½°E. Depth about 300 Km. (U.S.C.G.S).	
	ZV,	e(FcP)		11	58					
	ZV,	ePP		13	02					
	NE	eS		21	14					
	NE	e(ScS)		21	26					
	NE	ePS		23	33					
	NE	eSS		26	18					
	ZNE	eL		30	-					
	F		00	05				Indefinite.		
12	ZV,ZNE	e	21	25	22			22	+ 2	Near north coast of New Guinea 3½°S, 141°E. (U.S.C.G.S).
	NE	eL	22	05	-					
	N	M	26	01	-					
		F	23	20	-					
13	ZV,ZNE	iP	18	38	54			21	-280	Dilatation. Black Sea near north coast of Turkey. 43°N, 32½°E. (U.S.C.G.S).
	ZV,ZNE	i		39	02					
	ZV,ZNE	iPP		39	24					
	ZV,ZNE	iPPP		39	34					
	ZV,ZNE	i		41	03					
	ZV,ZNE	iS		43	18					
	ZV,ZNE	iSS		44	29					
	ZV,ZNE	eSSS		45	27					
	ZNE	eL		47	-					
	N	M		49	55	14				
	Z	M		53	18	14				
	E	M		53	23	14				
	ZNE	eL2		21	15	-				
	F		23	30	-			Via antipodes.		
14	Z	eP	18	47	38			6,760		
	ZNE	eS		55	54					
	ZNE	ePS		56	32					
	ZNE	e(SS)		58	40					
	ZNE	eL		09	00	-				
	F		30	-						
17	ZV,ZNE	iP	00	00	55			17	-3	5,430
	ZV,Z	i		01	04					
	ZV,ZNE	iPP		03	03					
	ZNE	iS		07	57					
	Z	iSP		08	11					
	ZNE	eScS		10	56					
	ZNE	eL		15	-					
	E	M		27	03	18				
	Z	M		27	08	18				
	N	M		27	21	17				
	F		01	10	-			+3		
17	ZNE	e	07	05	-					
		F		55	-					
18	ZNE	eP	03	57	47			(5,000)	Phases doubtful.	
	Z	ePKP	04	01	52					
	NE	ePP		03	24					
	NE	ePKS		04	30					
	ZNE	ePPP		06	50					
	ZNE	eSKS		07	55					
	ZNE	ePS		14	19					

(contd).



SEISMOLOGICAL BULLETIN.

AUGUST, 19 21

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI-TUDE.	Δ	REMARKS.
			h.	m.	s.				
(contd.) 18	ZNE	ePPS	04	15	56	27	- 5		
	ZNE	e		18	56				
	ZNE	e(SS)		22	52				
	ZNE	eL		35	-				
	E	M		41	52				
		F	05	25	-				
20	ZNE	eL	06	27	-				
		F	07	05	-				
20	ZNE	e	12	25	-				
		F	13	30	-				
20	ZV, NE	iP	22	57	03		2,720		
	ZNE	eS	23	01	24				
		eL		06	-				
		F		15	-				
21	ZNE	iPKP	11	15	37		(11,800)	Near west coast of Hawaii.	
	ZV,ZNE	iPP		15	56			19 ³ / ₄ °N, 156°W. (U.S.C.G.S).	
	ZNE	eSKS		21	59				
	NE	eSKKS		23	09				
	ZNE	ePS		24	59				
	NE	eSS		30	42				
	ZNE	eL		40	-				
	N	M		54	26	18	- 4		
	Z	M		59	22	17	- 5		
		F	14	05	-				
21	ZNE	e	19	15	-				
		F		50	-				
22	ZNE	e	06	10	-				
		F		50	-				
22	ZNE	e	14	20	-				
		F		35	-				
23	ZNE	e	22	30	-				
		F		40	-				
24	NE	e	07	05	-			Small.	
		F		25	-				
24	ZNE	e	09	36	12				
	ZNE	eL		39	-				
		F		55	-				
24	ZV	e	11	09	06			Possibly not seismic.	
				10	-				
24	ZV,Z	iP	13	33	21		(8,335)	Compression. e,NE.	
	ZV,ZNE	e		34	11				
	NE	e(S)		43	01				
	NE	e		44	15				
	ZNE	eL	14	05	-				
		F		40	-				



DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
28	ZNE	e	16	55	-				
		F	17	50	-				
29	ZV,	i (Pg)	02	21	12				Not very distinct. Small; shown on Galitzin components. Recorded at Dorking, Surrey.
	ZV,	i (Sg)		21	24				
	ZV,	e		21	30				
	ZV,	e		22	04				
	ZV,	i		22	31				
	ZV,	F		24	-				
30	ZNE	e	15	05	-				
		F		35	-				
31	ZV,Z	eP	12	34	43			3,460 e,NE.	
	NE	eS		39	50				
	ZNE	eL		42	-				
	N	M		43	54	17	+ 12		
	N	F		13	30	-			
31	ZV,Z	iP	20	23	39			2,600	
	ZNE	eS		27	48				
	ZNE	eSS		28	03				
	ZNE	eL		30	-				
	N	M		33	15	17	- 6		
	N	F		21	00	-			

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.**SEISMOLOGICAL BULLETIN FOR SEPTEMBER, 1951**

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION : RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS : (I) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS : FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T. sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ^2 .	$\frac{Ak}{\pi l}$ sec. ⁻¹
N.	23 July 1951	21.6	23.3	+ 0.05	52.8
E.	26 July 1951	17.4	18.7	+ 0.01	66.7
Z.	2 August 1951	14.1	11.8	+ 0.18	143.

(II) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV).

TIME SERVICE : MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
1	ZNE	e	05	40	-				
		F	06	25	-				
1	ZV, ZV,ZNE ZNE N	eP	06	59	07	19	+ 7	1,455	Felt in central Italy. (Strasbourg).
		eS	07	01	33				
		eL		02	-				
		M		03	27				
		F		30					
1	ZV,Z Z ZNE	ePKP	09	08	26			(14,000)	Easter Island region. 33°S, 110°W. (U.S.C.G.S).
		ePP		11	41				
		eL		05	-				
		F	11	30	-				
2	ZNE	e	00	35	-				Small.
		F		45	-				
2	NE ZNE	e	16	29	24				
		eL	17	10	-				
		F		30	-				
5	ZNE	eL	08	50	-				
		F	09	20	-				
7	ZV, ZV, ZV, ZV, ZV, ZV, ZV,	e(P)	23	08	03				Traces on Galitzin components. Doubtful interpretations. Felt in Belgium (Strasbourg).
		i(P)		08	33				
		i(Pg)		08	43				
		i(S)		08	57				
		i(S)		09	06				
		i(Sg)		09	12				
		F		10	-				

KEW OBSERVATORY, RICHMOND, SURF...
SEISMOLOGICAL BULLETIN.

SEPTEMBER, 19 51

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
8	ZNE	e	06	59	28				
	NE	e	07	04	00				
	ZNE	eL F	08	10 00	- -				
8	ZNE	e F	12	02 40	- -				
9	ZV,ZNE	ePKP1	05	03	42		(15,700)		Samoa Island region.
	Z	ePKP2		04	04				16°S, 173°W. (U.S.C.G.S).
	NE	ePP		07	19				
	ZNE	eSS		25	25				
	ZNE	eL		50	-				
	N	M	06	03	42	21	+ 4		
		F	07	15	-				
12	NE	e(S)	15	32	37		(9,000)		No "Z" record.
	NE	e(SS)		38	33				Kurile Islands region.
	NE	eL		50	-				45½°N, 151°E. (U.S.C.G.S).
	N	M		59	10	22	- 3		
	F	16	55	-					
14	ZNE	e	20	55	-				Small.
		F	21	10	-				
15	ZV,	eP	22	57	13			2,590	
	NE	eS	23	01	20				
	ZNE	eL		04	-				
	N	M		04	43	18	- 4		
	F	20		-					
16	ZV,	i(P)	16	57	36				Compression.
	ZV,	i		57	45				
		F	17	00	-				
17	ZV,Z	i(PKP)	12	17	27				Compression. NE,e.
	ZV,Z	i		17	36				
	ZV,Z	i		17	44				
	ZV,Z	e		17	56				
	ZNE	eL	13	10	-				
	N	M		21	02	18	- 2		
		F	14	10	-				
17	ZV,Z	e(PKP)	21	12	44				
	Z	e(SS)		28	58				
	Z	e(PSS)		29	05				
	ZNE	eL		40	-				
		F	22	25	-				
18	ZV,	e	12	06	09				Small.
		F		10	-				
19	ZV,Z	e	04	51	31				
	ZNE	eL	05	45	-				
		F	06	15	-				
19	Z	e	20	08	-				Small.
	F		15	-					

SEISMOLOGICAL BULLETIN.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLITUDE.	Δ	REMARKS.
			h.	m.	s.				
20	Z	e	01	31	05				Possibly two shocks.
	E	e		54	57				
	ZNE	eL	02	35	-				
		F	03	25	-				
20	ZNE	e	17	40	-				Small.
		F	18	10	-				
21	ZNE	e	04	40	-				Small.
		F	05	40	-				
21	ZNE	e	09	30	07				
	ZNE	e		38	59				
	ZNE	e		54	56				
	ZNE	eL	10	13	-				
		F	11	00	-				
21	ZNE	e	14	05	-				Small.
		F		25	-				
21	Z	e	19	04	56				
	Z	e		09	14				
	Z	e		15	02				
	ZNE	eL	20	05	-				
		F		50	-				
22/23	Z	e	21	56	19				
	NE	e		56	57				
	NE	e		58	00				
	ZNE	eL	00	00	-				
		F		30	-				
24	ZNE	eP	13	22	41			8,710	
	NE	eS		32	40				
	ZNE	eL		50	-				
	N	M	14	03	38	18	- 4		
		F	15	05	-				
27	ZV,	iP	19	32	43				e, Z. e, Z.
	ZV,	i		33	39				
	NE	e (s)		45	23				
	NE	e		47	22				
	ZNE	eL		55	-				
	N	M	20	02	42	20	+ 7		
		F	21	20	-				
28	ZNE	e	02	45	-				
		F	03	40	-				
28	ZNE	e	04	35	-				Small.
		F	05	00	-				
28	ZNE	e	12	45	-				
		F	13	20	-				
28	ZNE	e	15	10	-				
	ZNE	eL		30	-				
		F	16	55	-				

SEISMOLOGICAL BULLETIN.

SEPTEMBER, 19 51.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.	
			h.	m.	s.					
√28/29	Z	1PKP ₁	23	48	36	18	μ	-	km.	
	Z	1PKP ₂		49	08					
	ZNE	ePKS		52	50					
	ZNE	eL	00	45	-					
	E	M	01	11	00					
		F	02	40	-					
30	ZNE	e	05	45	-					
		F	06	30	-					
<u>Correction to August bulletin</u>										
Disturbances listed as occurring on the 24th at 09h., 11h and 13h should be amended to read 10h. 36m. 12s., 12h 09m. 06s., 14h. 33m. 21s., with similar corrections for the later pulses.										

AIR MINISTRY, METEOROLOGICAL OFFICE,KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.SEISMOLOGICAL BULLETIN FOR OCTOBER, 1951.

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: (I) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T. sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ^2 .	$\frac{Ak}{\pi l}$ sec. ⁻¹
N.	23 July 1951	21.6	23.3	+ 0.05	52.8
E.	26 July 1951	17.4	18.7	+ 0.01	66.7
Z.	2 August 1951	14.1	11.8	+ 0.18	143.

(II) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV.).

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD. sec.	AMPLI- TUDE. μ	Δ km.	REMARKS.
			h.	m.	s.				
1	ZV, ZNE ZNE E	iP eS eL M F	01	32	06	14	- 3	3,030	
				36	45				
			02	44	05				
				00	-				
1	ZV, ZNE N	e eL M F	10	32	06	18	+ 2		
				48	-				
			11	58	15				
45	-								
2	ZV, ZNE	e eL F	00	31	26			Small.	
				40	-				
2	ZNE	e F	01	14	20			Possibly not seismic.	
				50	-				
3	ZNE	e F	23	35	-			Small.	
				55	-				
4	ZNE	e F	15	30	-			Small.	
				16	00				
5	Z ZNE	e eL F	07	02	56				
				55	-				
				08	55				-
5	ZV,Z Z ZNE	iPKP e ePP	11	57	28				
				58	03				
				12	02				16

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN.

OCTOBER, 19 51

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
(contd)									
5	ZNE	e	12	07	55				
	ZNE	e(SKKS)		11	02				
	ZE	e(PPS)		20	17				>180°
	ZNE	eL		55	-				>180°
	E	M	13	05	33	21	- 2		
		F	14	10	-				
6	ZV,Z	eP	03	49	01				
	ZV,Z	e		50	00				
	ZV,Z	e		52	43				
	NE	e	04	01	25				
	ZNE	eL		50	-				
	N	M	05	02	03	18	+ 1		
		F		45	-				
7/8	-	-	-	-	-				Galitzin drums not traversing 7d 08h 24m to 8d 09h 18m.
9	ZNE	e	16	55	-				
		F	17	25	-				
11	ZV,Z	iPKP	01	56	41			(15000)	Dilatation.
	ZV,Z	iPP		59	58				
	ZNE	e	02	00	16				
	ZNE	ePS		09	05				
	NE	ePPS		10	50				
	ZNE	eL		35	-				
	N	M	04	54	43	22	+ 6		
		F		15	-				
11	ZNE	e	11	10	-				Small.
		F		25	-				
13	ZNE	e	20	28	-				Small.
		F		35	-				
13/14	Z	e(P)	22	50	00			(12,000)	Microseisms, doubtful.
	ZNE	e(PPP)		57	29				
	ZNE	e(PS)	23	03	56				
	ZNE	eL		20	-				
	N	M		30	50	18	+ 2		
		F	00	45	-				
14	ZNE	e	10	25	-				
		F	11	00	-				
15	NE	e(S)	21	25	33				
	ZNE	eL		45	-				
		F	22	40	-				
16	Z	eP	07	00	13				
	ZNE	eL		05	-				
		F		30	-				
16	ZNE	e	19	40	-				Small.
		F	20	10	-				
18	ZNE	e	05	41	-				Small.
		F	06	00	-				



SEISMOLOGICAL BULLETIN.

OCTOBER,

19 51

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI-TUDE.	Δ	REMARKS.
			h.	m.	s.				
✓ 18	ZV,Z	iP	08	38	38			(9,600)	Compression, e NE. Depth about 100 Km.
	ZNE	epP		38	49				
	ZV,Z	isP		39	03				
	ZV,Z	iPP		41	49				
	ZNE	eSKS		48	49				
	NE	e(S)		49	21				
	ZNE	ePS		49	33				
	NE	eSSS	09	00	10				
	ZNE	eL		05	-				
	N	M		12	55	23	+ 11		
	E	M		13	23	20	+ 6		
Z	M		15	04	24	+ 10			
		F	11	05					
19	ZNE	e	01	05				Small.	
		F	02	15					
19	ZV,Z	iP	15	04	00				
		ZNE		35	-				
		F	16	10					
20 / 21	-	-	-	-	-			Galitzin drums not traversing 20d 09h 06m to 21d 10h 14m.	
21	ZNE	e	15	00					
		F		25	-				
✓ 21/22	ZV,Z	iP	21	47	12			(10,580)	Dilatation. Destructive in Formosa. Followed by numerous after shocks.
	ZV,ZNE	i		47	19				
	ZV,ZNE	i		47	38				
	ZNE	iPP		50	59				
	Z	e		56	33				
	ZNE	eSKS		58	10				
	ZNE	e(S)		58	34				
	ZNE	ePS		59	27				
	ZNE	eSS	22	03	59				
	ZNE	eSSS		08	18				
	ZNE	eL		10	-				
	ZV,	e		20	13				
	N	M		22	-	(28)	(+170)		
	E	M		25	-	(18)	(-150)		
	Z	M		36	-	(15)	(+120)		
		F	02	15	-				
✓ 22	ZV,ZNE	epP	03	42	26			9,490	Doubtful. Overlapped.
	Z	e		43	07				
	Z	iPP		46	01				
	NE	eS		53	03				
	ZNE.	iPS		53	35				
	ZE	eSS		58	50				
	ZNE	eSSS	04	03	37				
	ZNE	eL		03	-				
	E	M		20	-	(17)	(+95)		
	N	M		34	-	(22)	(-120)		
Z	M		41	-	(17)	(+100)			
	F	-	-	-					
22	ZV,	eL	05	20				Overlapped.	
		F	-	-					

KEW OBSERVATORY, RICHMOND, SURREY,
SEISMOLOGICAL BULLETIN.

OCTOBER, 19 51

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
22	ZV,Z	iP	05	56	10				Doubtful.
	ZV,Z	iPP		59	36				
	ZNE	eL	06	01	-				
	E	M		32	-	(22)	(-90)		
	N	M		30	-	(21)	(+65)		
	Z	M		39	-	(15)	(+55)		
22	ZNE	F	09	10	-				Numerous small aftershocks.
22	ZNE	e	09	55	-				Overlapped.
		F	-	-	-				
22	ZNE	e	11	05	-				Overlapped.
	ZNE	eL		34	47				
	Z	M	12	08	56	14	+20		
	N	M		08	56	16	-17		
	E	M		08	56	16	-14		
		F	-	-	-				
22	ZNE	e	13	11	59				Overlapped.
	ZNE	eL		30	-				
	Z	M		46	20	19	-30		
	N	M		59	00	14	-9		
	E	M		59	00	18	-26		
22	ZNE	eL	15	30	-				Overlapped.
	E	M		44	29	14	-7		
	N	M		44	32	15	-9		
	Z	M		44	35	14	+10		
22	ZNE	eL	16	15	-				Overlapped.
	N	M		27	28	15	-40		
	Z	M		27	29	17	-55		
	E	M		28	26	14	-30		
22	ZNE	eL	16	50	-				Overlapped.
	E	M	17	04	41	14	-8		
	Z	M		04	43	14	+11		
22	ZNE	F	18	00	-				Overlapped.
22	ZNE	eL	19	27	-				Overlapped.
		F	20	20	-				
22	ZNE	eL	21	06	-				Overlapped.
		F	-	-	-				
22	ZNE	eL	21	36	-				Overlapped.
	N	M		49	28	15	-13		
	Z	M		49	43	13	-7		
23	ZNE	F	22	25	-				Overlapped.
23	ZNE	e	00	06	-				Overlapped.
		F	01	15	-				

SEISMOLOGICAL BULLETIN.

OCTOBER, 19 51

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
✓ 23	ZV,ZNE	ePP	01	36	05			(10,000)	Repetition Formosa.
	ZNE	eSKS		43	18				
	ZNE	ePS		44	50				
	ZNE	eSS		49	37				
	NE.	eSSS		53	05				
	ZNE	e		56	38				
	ZNE	eL	02	00	-				
	N	M		17	19	17	+30		
	Z	M		17	22	15	-28		
	E	M		17	28	15	-19		
✓ 23	Z	eP	09	07	21			(11,050)	
	ZNE	e(SKS)		18	46				
	ZNE	e(S)		19	02				
	ZNE	eL		35	-				
	N	M		45	44	18	-17		
	E	M		48	27	18	-16		
	Z	M		53	31	14	+9		
		F	11	10	-				
23	ZNE	e	14	17	-				
		F		50	-				
✓ 23	ZNE	eL	19	05	-				
	Z	M		16	41	15	+4		
23	ZNE	e	22	50	-				Small.
		F	23	00	-				
✗ 24	Z	e(P)	03	51	50				
	ZNE	e(SKS)	04	02	26				
	ZNE	eL		23	-				
	N	M		36	40	17	+7		
	Z	M		36	44	14	-8		Overlapped.
		F	-	-	-				
24	ZNE	e	05	08	-				
		F		40	-				
24	ZNE	e	07	15	-				Small.
		F		35	-				
24	ZNE	e	07	42	-				Small.
		F		55	-				
24	ZNE	e	08	20	-				Small.
		F		55	-				
24	ZNE	e	14	35	-				Small.
		F		50	-				
24	ZNE	e	20	10	-				Small.
		F		25	-				
24	ZNE	e	21	05	-				Small.
		F		15	-				

SEISMOLOGICAL BULLETIN.

OCTOBER, 19 51.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
25	ZNE	e F	04 05	50 15	-				Small.
25	ZNE	e(PPP)	12	39	57				
	ZNE	eSKS		43	10				
	ZNE	eS		43	39				
	ZNE	eSS		50	10				
	NE	eSSS		55	05				
	ZNE	eI	13	05	-				
	N	M		10	59	17			-11
	E	M		12	58	17			+14
	X	M		17	43	15			-17
		F	14	10	-				
26	ZNE	e F	06 07	50 15	-				Small.
28	ZNE	e	02	45	-				
	Z	M		53	41	14			+4
		F	03	20	-				
28	ZV,Z	ePKP	07	07	50				
	ZV,Z	ePP		09	06				
	ZNE	ePPP		12	24				
	ZV,	e		17	00				
	ZNE	ePS		19	18				
	ZNE	eSS		26	36				
	ZNE	e(SSS)		29	56				
	ZNE	eL	08	10	-				
	N	M		25	03	19			-6
		F	09	30	-				
29	ZNE	e F	00 01	25 55	-				Small.
29	ZNE	e F	16	46 55	-				Small.
29	ZNE	e F	21 22	50 15	-				Small.
30	ZNE	e F	14 15	57 00	-				Small.
30	ZNE	e F	16	15 30	-				Small.
30	ZNE	e F	16 17	42 00	-				Small.
31	ZV,Z	iP	07	09	48			10,330	Compression. e NE.
	ZNE	ePP		13	39				
	E	eSKS		20	27				
	NE	eS		21	01				
	NE	eSS		27	32				
	N	eSSS		33	30				
	ZNE	eL		36	-				
	N	M		55	39	23			- 6
		F	10	15	-				

SEISMOLOGICAL BULLETIN.

OCTOBER, 19 51

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
31	ZNE	e F	11	10	-				Overlapped.
			-	-	-				
31	Z	e	12	11	46				
	ZNE	e		20	00				
	ZNE	eL		35	-				
	N	M		43	18	22	- 3		
		F	13	35	-				
31	ZNE	e F	19	02	-				Small.
			20	05	-				

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: (I) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T. sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ^2 .	$\frac{Ah}{\pi l}$ sec. ⁻¹
N.	23 July 1951	21.6	23.3	+ 0.05	52.8
E.	26 July 1951	17.4	18.7	+ 0.01	66.7
Z.	2 August 1951	14.1	11.8	+ 0.18	143.

(II) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV.).

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD. sec.	AMPLITUDE. μ	Δ km.	REMARKS.
			h.	m.	s.				
1	ZV, Z	eP	11	20	36	17	+ 3	7,540	NE, e.
		iPcP		21	04				
		eS		29	34				
		eSS		33	10				
		eL		43	-				
2	ZV, Z	M	12	20	-	17	+ 6	3430	Microseisms.
		F							
3	ZNE	eP	22	02	17	18	- 9		Philippines. 11½°N, 125°E.(U.S.C.G.S). Microseisms.
		eS		07	22				
		eSS		09	00				
		eL		10	-				
4	ZNE	M	23	16	05	18	- 9		Philippines. 11½°N, 125°E.(U.S.C.G.S). Microseisms.
		F		23	10				
6	ZNE	e	14	00	-	18	- 9		Philippines. 11½°N, 125°E.(U.S.C.G.S). Microseisms.
		eL		20	-				
		F		45	-				
6	ZV, Z	e(P)	15	29	22	18	- 9		Philippines. 11½°N, 125°E.(U.S.C.G.S). Microseisms.
		e		41	30				
6	ZNE	eL	16	47	-	18	- 9		Philippines. 11½°N, 125°E.(U.S.C.G.S). Microseisms.
		F		15	-				

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ			
			h.	m.	s.					sec.	μ
6	ZV,ZNE	iP	16	52	14			(8,600)	Kurile Islands. 47°N, 154°E. (U.S.C.G.S).		
	ZNE	ePcP		52	45						
	ZNE	e		53	44						
	ZNE	ePPP		56	52						
	NE	e		58	28						
	NE	i(S)	17	02	06						
	ZNE	ePS		02	34						
	ZNE	e		13	40						
	ZNE	e		14	45						
	NE	e		19	48						
	ZNE	eL		25	-						
	E	M		31	22					18	+45
	N	M		31	52					21	-65
Z	M		37	43	16	+43					
	F		-	-			Overlapped.				
6	ZV,	e(P)	19	02	35				Microseisms.		
	ZNE	eL		40	-						
		F	21	20	-						
7	ZNE	e	18	20	-				Small.		
		F		30	-						
8	ZV,ZNE	eP	13	56	38			(8,340)			
	Z	e		58	34						
	NE	e(S)	14	06	19						
	NE	e(SKS)		06	49						
	NE	e		08	40						
	ZNE	e(SSS)		14	24						
	ZNE	eL		23	-						
	N	M		32	08					17	+8
	F		-	-			Overlapped.				
8	ZNE	eL	16	32	-						
		F	17	15	-						
9	ZNE	eL	06	38	-						
		F	07	10	-						
9	Z	e(P)	08	09	37						
	ZNE	eL		35	-						
	N	M		53	56					18	+2
		F	09	55	-						
9/10	ZNE	e(S)	22	31	43				Microseisms.		
	ZNE	e(SKS)		32	32						
	ZNE	eL		55	-						
	N	M	23	04	05					19	+1
	F	00	15	-							
10	ZNE	e	06	45	-				Microseisms.		
		F	07	25	-						
10	ZNE	e	08	13	-				Microseisms.		
		F		35	-						
11	Z	e	12	44	37				Microseisms.		
	ZNE	eL	13	00	-						
		F		30	-						

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
✓ 12	ZV, Z	iP	08	21	36			8,730	Compression. Kurile Islands region. 47°N., 154°E. (U.S.C.G.S).
	ZNE	iPP		24	35				
	ZV, ZNE	e		27	48				
	ZV, ZNE	eS		31	36				
	ZNE	ePS		32	21				
	NE	eSS		36	29				
	ZNE	eL		41	-				
	Z	M	09	03	06	17	+12		
	N	M		03	11	18	+12		
	E	M		03	22	18	-12		
✓ 12	ZV,	i(P)		33	03			Overlapped.	
	F		11	30	-				
12	ZV,	iP	19	34	35			Small.	
	ZNE	eL	20	05	-				
	F			45	-				
13	ZNE	e	15	05	-			Small.	
	F			30	-				
14	ZNE	e	07	05	-			Small.	
	F			30	-				
15	ZNE	e	09	05	-			Microseisms.	
	F		10	00	-				
15	ZV, ZNE	e	10	11	56			Microseisms.	
	ZNE	e		19	46				
	ZNE	eL		45	-				
	Z	M	11	24	32	16	+4		
	F		13	10	-				
✓ 15	ZV,	iP	19	53	52			9,080	Kamchatka. 52½°N., 160½°E. (U.S.C.G.S).
	NE	eS	20	04	09				
	ZNE	eL		15	-				
	N	M		34	10	19	+3		
	F		21	30	-				
15	ZNE	eL	22	42	-			Large microseisms.	
	F		23	30	-				
16	NE	e	15	34	13			Large microseisms.	
	ZNE	eL		47	-				
	N	M	16	13	21	18	-5		
16	ZNE	e	18	50	-			Large microseisms.	
	F		20	10	-				
✓ 17	ZNE	e	05	05	37			Large microseisms.	
	ZNE	e		13	49				
	ZNE	eL		20	-				
	N	M		26	52	14	-6		
	F		06	25	-				
18	ZNE	e	05	20	-			Large microseisms.	
	F			50	-				

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLITUDE.	Δ	REMARKS.
			h.	m.	s.				
18	ZV, Z	iP (1)	09	37	33			7850(1)	Dilatation. Eastern Tibet. 31°N., 90½°E. (U.S.C.G.S). Large microseisms.
	ZV, ZNE	iP (2)		46	38			7370(2)	
	ZNE	iS (1)		46	47				
	ZE	iPS (1)		46	53				
	ZNE	iPP (2)		49	24				
	NE	ePPP (2)		50	56				
	ZNE	eSS (1)		51	26				
	ZNE	iS (2)		55	38				
	ZNE	ePS (2)		56	16				
	ZNE	iSS (2)	10	01	10				
	ZNE	eL		02	-				
	Z	M		18	(56)	24	(+300)		
	N	M		23	(21)	16	(+150)		
E	M		25	(52)	18	(+150)			
	F		14	20	-				
18	ZNE	e	19	00	-			Microseisms.	
		F		35	-				
19	ZNE	e	21	35	37			Microseisms.	
	ZNE	eL	22	20	-				
		F	23	25	-				
22	ZNE	eL	03	05	-			Microseisms.	
		F		40	-				
24	ZNE	e	02	30	-			Microseisms.	
		F	03	00	-				
24	ZV, ZNE	iP (1)	19	00	14			9,850(1)	Formosa. 23°N., 121½°E. (U.S.C.G.S). Microseisms.
	ZV, ZNE	iP (2)		03	13			9,900(2)	
	ZV, ZNE	iPP (1)		03	39				
	ZV, ZNE	iPP (2)		06	55				
	ZNE	i		08	39				
	ZV, Z	iPPP (2)		09	20				
	ZNE	iS (1)		11	06				
	ZNE	ePS (1)		11	46				
	ZNE	eS (2)		14	08				
	ZNE	ePS (2)		14	44				
	ZNE	eSS (2)		20	20				
	ZNE	eL (1)		25	-				
	ZNE	eSSS (2)		26	36				
	ZNE	eL (2)		30	-				
	E	M		40	14	23	(+220)		
	N	M		43	58	22	(+220)		
	Z	M		48	49	21	+280		
	F		00	45	-				
25	NE	e	05	35	-			Microseisms.	
		F	06	15	-				
25	ZNE	e	14	35	-			Microseisms.	
		F	15	05	-				
26	ZV, Z	iP	06	51	32			(9,820)	Microseisms.
	ZV, Z	ePP		55	04				
	NE	e(S)	07	02	23				
	NE	e(SKS)		03	01				
	NE	e(ScS)		03	33				
NE	eSS		08	19					

SEISMOLOGICAL BULLETIN.

NOVEMBER, 19 51

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI-TUDE.	Δ	REMARKS.
			h.	m.	s.				
(contd). ✓ 26	NE	eSSS	07	14	53				
	ZNE	eL		20	-				
	N	M		32	46	22	+ 16		
	E	M		36	13	14	- 14		
	Z	M		36	15	14	+ 18		
		F	08	35	-				
29	ZNE	e	05	05	-				Microseisms.
		F		30	-				
29	ZNE	e	05	43	-				Microseisms.
		F	06	20	-				
29	ZNE	e	15	05	-				Microseisms.
		F		35	-				
30	ZNE	e	08	05	-				Small.
		F		30	-				Microseisms.

SEISMOLOGICAL BULLETIN FOR DECEMBER, 19 51

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION : RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS : (I) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS : FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T_1 sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ^2 .	$\frac{Ak}{\pi l}$ sec. ⁻¹
N.	23 July 1951	21.6	23.3	+ 0.05	52.8
E.	26 July 1951	17.4	18.7	+ 0.01	66.7
Z.	2 August 1951	14.1	11.8	+ 0.18	143.

(II) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV.).

TIME SERVICE : MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLITUDE.	Δ	REMARKS.
			h.	m.	s.				
3	ZNE	e F	07	30	-				Small.
4	ZV, ZNE	e	08	58	16				Microsesims.
		F	09	02	08				
5	NE ZNE	e	00	33	36				Large microseisms.
		F	01	55	-				
5	ZNE N	eL	07	35	-	21	- 8	(10,920)	Microseisms. NE, e. Indian Ocean southeast of Madagascar. 34°S, 56½°E. Depth about 100 Km. (U.S.C.G.S).
		F	08	48	42				
8	ZV, ZV,Z ZV,ZNE ZNE NE ZNE ZNE ZNE ZNE ZNE N E Z	eP	04	27	58				Microseisms. NE, e. Indian Ocean southeast of Madagascar. 34°S, 56½°E. Depth about 100 Km. (U.S.C.G.S).
		iP _c P		28	07				
		e		31	34				
		ePP		32	09				
		eSKS		38	40				
		e(S)		39	34				
		ePS		41	00				
		eSS		46	26				
		eSSS		50	38				
		eL		55	-				
	M	05	16	14	21	+ 75			
	M		16	37	16	+ 50			
	M		18	06	16	+ 50			
	F	09	10	-					

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLI- TUDE.	Δ	REMARKS.
			h.	m.	s.				
11	ZNE	e F	22	00 25	- -				Small.
12	ZV,ZNE	iP	01	49	36			8,730	Compression. Oaxaca, Mexico. 17°N, 94½°W. Depth about 100 Km.(U.S.C.G.S)
	ZNE	iP _c P		50	02				
	ZNE	e		58	42				
	ZV,ZNE	iS		59	36				
	NE	iPS	02	00	10				
	NE	i		00	33				
	ZNE	eSS		04	44				
	ZNE	eL		10	-				
	E	M		19	52	22	+ 10		
	N	M		20	15	28	+ 11		
	Z	M		20	36	25	+ 12		
		F	03	25	-				
13	ZV,Z	eP	20	50	49			(2,520)	Microseisms.
	ZNE	e(s)		54	50				
	ZNE	eL		57	-				
		F	21	10	-				
14	N	e F	05 06	50 10	- -				Microseisms, possibly not seismic.
18/19	-	-	-	-	-				18d. 09h. 20m. to 19d. 11h. 10m. No Galitzin records.
20	N	e	19	20	19				Large microseisms.
	ZNE	eL		22	-				
		F		35	-				
21	N	e	08	59	10				Large microseisms. Chart changing.
	ZNE	eL	09	(20)	-				
	N	M		34	46	19	+ 9		
		F	10	30	-				
23	ZNE	e F	01 02	40 50	- -				Large microseisms.
23	ZNE	e F	07 08	45 25	- -				Large microseisms.
23	ZNE	e F	23	00 50	- -				Large microseisms.
25	NE	e F	13	45 55	- -				Microseisms, possibly not seismic.
25	ZNE	e(L) F	16 17	45 15	- -				Microseisms.
26	ZNE	e F	01	25 50	- -				Microseisms.
26	ZNE	eL	10	40	-				Large microseisms. Chart changing.
	F	M		43	53	26	+ 9		
	N	M		44	08	22	+ 14		
		F	11	30	-				

DATE	COMP.	PHASE	G.M.T.			PERIOD.	AMPLITUDE.	Δ	
			h.	m.	s.				
20	ZNE Z	e(L)	16	57	-	14	- 8	10,200	Large microseisms.
		M	17	11	46				
		F		30	-				
20	ZNE	e	17	35	-				Large microseisms.
		F	18	10	-				
20	ZV,ZNE	iP	09	32	44	27	+ 22	10,200	Compression. Large microseisms. Deeper than normal.
	Z	e		34	27				
	ZNE	ePP		35	51				
	ZNE	iSKS		43	06				
	ZNE	iS		43	51				
	ZNE	e(PS)		45	07				
	ZNE	e		47	26				
	ZNE	eL		56	-				
	N	M	10	05	30				
	E	M		09	16				
	Z	M		16	22				
20	NE	e	13	00	-				Large microseisms.
		F	22	39	-				
30	ZV, ZV, ZV, ZV, ZNE	iP	18	29	54				Large microseisms.
		e		30	07				
		e		30	15				
		e		30	26				
		eL		47	-				
		F	19	15	-				
30	NE ZNE	e	23	15	-				Large microseisms.
		eL		20	-				
		F		55	-				

