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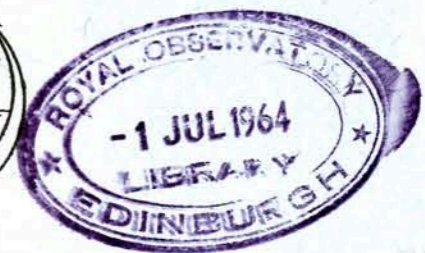
SEISMOLOGICAL BULLETIN OF PAKISTAN

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GEOPHYSICAL INSTITUTE
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Vol. 7

January 1961

No. 1

CONTENTS

1.	Particulars of Stations and Instruments	1
2.	Major shocks	...	...	...	3
3.	Local and Minor shocks	...	...	...	22

Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Quetta (Central Station)				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Contd.)

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Se =Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki) stand for seismological observatories Pasadena (U.S.A.),
 Berkley (U.S.A.), Uppsala (Sweden) and Kiruna (Sweden) respectively.
 All times are in Greenwich Mean Time.

Seismological Bulletin of Pakistan
 Volume 7 No. 1, January 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
1	Ch	ePZ	13	58	28	2	Qt	ePKP ₂ Z	03	36	38
		esPZ		59	04			eXZ		39	12
		ePPZ			24			USCGS H 03 16 41.0			
		eSZ	14	03	09			41.4 S 88.8 W			
	Lh	ePZ		00	39			Off coast of Chile			
	Qt	ePZ		01	29			depth about 25 km			
		USCGS H 13 52 37.6				2	Ch	ePZ	10	24	00
		19.4 N 121.0 E						epPN*			44
		Near north coast of						esPN*			25 08
		Luzon						ePPPN*			29 13
		Philippine Islands						eSN*			34 04
		depth about 77 km						esSN*			35 19
1	Qt	ePKPZ	16	56	13		Lh	ePZ			25 29 c
		USCGS H 16 38 27.8						eSKSE			36 02
		18.3 S 178.2 W						eSE			50
		Fiji Islands region					Wr	iPZ			25 34 c
		depth about 663 km					Qt	ePZ			49 c
1	Qt	ePZ	17	56	30			eXZ			29 16
1	Qt	ePZ	19	46	54			ePPPZ			32 40
		USCGS H 19 33 20.1						iSKSNEN*			36 27
		54.1 S 7.4 E						iSN*			37 35
		Bouvet Islands region						iSSN*			44 56
		depth about 91 km						USCGS H 10 11 56.9			
1	Qt	ePKPZ	22	30	08			12.4 S 166.4 E			
		USCGS H 22 11 15.5						Santa Cruz Islands			
		29.0 S 177.1 W						region			
		Kermadec Islands region						depth about 161 km			
		depth about 115 km						Mag 6 3/4 (Pas), 6 1/2-6 3/4 (Berk)			
2	Qt	ePZ	01	58	35	2	Wr	ePZ	12	59	15 d
		eXZ			49		Qt	ePZ			35 d

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Date	Station	Phase	h	m	s
		USCGS H	12	49	12.1
		5.3 N	127.4	E	
		Near Mindanao			
		Philippine Islands			
		depth about 66 km			
2	Lh	ePZ	21	04	15
	Qt	ePZ			48d
		epPZ			05 06
		USCGS H	20	51	59.3
		6.8 S	150.3	E	
		New Britain region			
		depth about 62 km			
3	Qt	ePKPZ	05	46	38d
		ePKP ₂ Z			48
		USCGS H	05	26	54.8
		44.7 S	76.6	W	
		Off coast of southern			
		Chile			
		depth about 25 km			
3	Ch	ePZ	09	29	59
	Wr	ePZ			32 10
	Qt	ePZ			52
3	Wr	ePZ	09	54	14
	Qt	ePZ			55 17
3	Ch	ePZN*	11	49	13
		epPZN*			36
		esPZN*			51
		ePPZN*			51 06
		ePPPZN*			57
		eSN*			55 57

Major Shocks

Date	Station	Phase	h	m	s
		ePSN*	56	25	
		esSN*			39
	Lh	ePZ	51	18	
		eSZ	59	46	
	Wr	iPZ	51	41	c
		eSZ	12	00	31
	Qt	ePZ	11	51	53 c
		eSNE	12	00	58
		Mu			Sec
		PZ	0.4		1.7
		$\Delta = 70^\circ.6$			
		USCGS H	11	40	42.5
		6.8 S	129.3	E	
		Banda Sea			
		depth about 72 km			
		Mag 6 (Qt)			
3	Qt	ePZ	18	04	00
3	Wr	ePZ	19	37	58
	Qt	ePZ	38	12	c
		epPZNE			36
		ePPZ	40	49	
		eSE	47	18	
		Mu			Sec
		PZ	0.2		1.4
		$\Delta = 71^\circ.0$			
		USCGS H	19	27	00.4
		6.4 S	130.4	E	
		Banda Sea			
		depth about 100 km			
		Mag 5.8 (Qt)			

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Date	Station	Phase	h	m	s
3	Lh	ePZ	20	15	33
	Wr	ePZ			56
	Qt	ePZ	16	05	
		USCGS H	20	05	33.8
		7.3 S	123.0	E	
		Banda Sea			
		depth about 154 km			
4	Ch	ePZ	01	56	24
	Lh	ePZ			58 38
	Wr	iPZ			59 01d
	Qt	ePZ			19d
		USCGS H	01	50	18.0
		5.5 N	122.5	E	
		Celebes Sea			
		depth about 633 km			
4	Wr	ePZ	11	40	29
	Qt	ePZ			42
		USCGS H	11	29	53.1
		6.9 S	121.7	E	
		Flores Sea			
		depth about 25 km			
4	Qt	ePZ	12	18	42
4	Qt	ePKPZ	12	23	46
		USCGS H	12	04	33.8
		17.6 N	101.2	W	
		Near coast of			
		Guerro Mexico			
		depth about 40 km			
4	Ch	ePZ	19	24	29
	Lh	ePZ			26 39

Major Shocks

Date	Station	Phase	h	m	s
	Wr	iPZ			59 c
	Qt	ePZ			27 12 c
		ePPZ			29 39
		eSNE			35 53
		Mu			Sec
		PZ	0.2		1.4
		$\Delta = 67^\circ.5$			
		USCGS H	19	16	19.5
		5.5 S	128.7	E	
		Banda Sea			
		depth about 173 km			
		Mag 5.7 (Qt)			
5	Ch	ePZN*	14	18	07
		epPZN*			19
		esPZN*			24
		ePPZN*			20 55
		ePPPZ			22 38
		eSN*			27 36
		esSN*			57
		ePSN*			28 17
		ePPSN*			32
	Wr	iPZ			18 15 c
	Lh	ePZ			20 c
		eSZ			28 04
		Mu			Sec
		PZ	1.1		1.2
		$\Delta = 77^\circ.5$			
	Qt	iPZNE	14	18	46 c
		iPcPZE			50
		epPZN			56

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Date	Station	Phase	h	m	s
	Lh	ePZ	30	02	
	Wr	ePZ		08	
	Qt	ePZ		45	d
		esPZ		59	
		ePPZN	33	00	
		eSNE	39	00	
		USCGS H 01 20 30.8			
		42.5 N 143.4 E			
		Hokkaido, Japan			
		depth about 21 km			
6	Ch	iPZ	06	33	13 c
	Wr	ePZ		23	
	Lh	ePZ		27	
	Qt	ePZ		55	c
		USCGS H 06 21 38.6			
		51.8 N 176.2 W			
		Andreanof Islands			
		Aleutian Islands			
		depth about 48 km			
6	Qt	ePZ	07	16	56
		USCGS H 07 05 47.7			
		53.3 N 159.7 E			
		Kamchatka			
		depth about 24 km			
7	Wr	iPZ	00	53	55 d
		iSN	54	22	
	Lh	ePZ		36	
		eSE	55	35	
	Qt	ePZ		00	c
		eSZNE	56	17	

Major Shocks

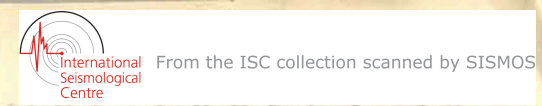
Date	Station	Phase	h	m	s
	Ch	ePZ	59	35	
		H 00 53 21			
		35.1 N 71 E			
		Hindukush			
		depth about 150 km			
7	Qt	ePZ	10	37	37
		epPZ	38	05	
		ePPZ	54		
		eSNE	43	00	
	Wr	ePZ	37	58	
	Lh	ePZ	38	24	
		USCGS H 10 30 58.0			
		35.9 N 27.0 E			
		Dodecanese Islands			
		depth about 127 km			
7	Qt	ePZ	16	00	16
	Wr	ePZ		33	
		USCGS H 15 52 54.0			
		37.7 N 21.1 E			
		Near west coast of Greece			
		depth about 22 km			
7	Qt	ePKPZ	18	35	38 c
	Lh	ePKPZ		45	
	Wr	ePKPZ		46	
		USCGS H 18 16 51.2			
		57.2 S 25.3 W			
		Sandwich Islands			
		depth about 94 km			
8	Lh	ePZ	01	25	08 c

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Date	Station	Phase	h	m	s
	Wr	eSE	33	02	
	Kr	ePZ	25	29	
	Qt	ePZ	41		
		ePZ	49	d	
		epPZ	16		
		ePPZ	28	09	
		eSNEN*	34	22	
		USCGS H 01 15 25.6			
		4.1 N 129.3 E			
		Halmahera region			
		depth about 106 km			
8	Ch	ePZ	03	04	05
		epPZN*	38		
		esPZN*	56		
		ePPN*	05	51	
		ePPPZN*	06	13	
		eSN*	10	10	
		esSZN*	11	04	
	Lh	ePZ	06	18	
		eSE	14	16	
	Wr	ePZ	06	36	
	Kr	eFZ	52	±	
	Qt	ePZ	56		
		eXZ	07	08	
		ePcPZ	32		
		esPZ	40		
		ePPZN	09	21	
		eSNN*	15	30	
		esSN*	16	06	

Major Shocks

Date	Station	Phase	h	m	s
		USCGS H 02 56 34.1			
		3.5 N 129.6 E			
		Halmahera region			
		depth about 117 km			
8	Qt	ePZ	20	14	44
		eSNE	16	45	
9	Qt	ePZ	03	21	29
		USCGS H 03 08 37.7			
		31.2 N 41.0 W			
		North Atlantic Ocean			
		depth about 49 km			
10	Ch	ePZ	09	21	13
	Lh	ePZ	23	24	
	Wr	iPZ		50	c
	Qt	ePZ	24	03	c
		USCGS H 09 12 54.2			
		5.9 S 130.0 E			
		Banda Sea			
		depth about 84 km			
10	Qt	ePZ	11	15	10
10	Qt	ePZ	13	11	04
10	Ch	ePZ	14	32	07 c
		epPZ	17		
		esPZ	20		
		ePcPZ	33	04	
		ePPZ	34	13	
		ePPPZN*	35	28	
		eSN*	39	54	
		ePSN*	40	08	
		esSZN*	10		



Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Date	Station	Phase	h	m	s
		eScSN*	41	49	
	Lh	ePZ	32	33	
	Wr	iPZ	35	c	
	Qt	ePZ	33	12	c
		eXZ	16		
		ePcPZ	36		
		ePPZ	35	35	
		iSNEN*	42	02	
		eScS	43	07	
		eSSNN*	46	32	
		ePKPPKPZ	15	01	35
		Mu	Sec		
		PZ	0.9	2.0	
		PPZ	0.3	1.5	
		$\Delta = 67^\circ 0$			
	Kr	ePZ	14	33	37 c
		USCGS H	14	22	18.2
		49.9 N	156.2	E	
		Kurile Islands region			
		depth about 29 km			
		Mag $6\frac{1}{4}$ (Berk), $6\frac{1}{4}$ - $6\frac{1}{2}$ (Pal)			
		$6\frac{3}{4}$ (Pas), 6.7 (Qt)			
10	Wr	iPZ	14	55	31
	Qt	ePZ	50		
11	Qt	ePZ	12	10	49
		USCGS H	11	58	23.8
		52.3 N	170.7	W	
		Fox Islands			
		Aleutian Islands			
		depth about 42 km			

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961
Major Shocks

Date	Station	Phase	h	m	s
11	Ch	ePZ	12	11	49
		ePcPZ	57		
		epPZ	12	06	
		esPZ	14		
		ePPZ	14	48	
		ePPPN*	16	33	
		iSN*	21	37	
		eScSN*	58		
	Wr	ePZ	11	54	
	Lh	ePZ	57		
		eSKSNE	22	00	
		ePSE	40		
	Qt	ePZ	12	24	
		epPZ	38		
		ePPZ	15	36	
		iSNEN*	22	49	
		iScSNE	58		
		esSNE	18		
		iPSN*	41		
		ePPSN*	24	02	
		i(SS)N*	28	36	
		eLN*	35.0		
		USCGS H	11	59	55.0
		51.8 N	171.0	W	
		Fox Islands			
		Aleutian Islands			
		depth about 47 km			
12	Wr	iPZ	14	25	38
	Lh	ePZ	46		
	Ch	ePZ	26	05	

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Date	Station	Phase	h	m	s
	Qt	ePZ	06	c	
		USCGS H	14	13	27.7
		57.4 N	155.9	W	
		Alaska Peninsula			
		depth about 40 km			
12	Qt	ePZ	19	27	41
	Lh	ePZ	57		
13	Qt	ePZ	19	31	05 c
	Lh	ePZ	24		
		USCGS H	19	18	44.7
		46.5 S	34.1	E	
		Near Prince Edward			
		Islands			
		depth about 25 km			
14	Qt	ePZ	02	38	04
		eXZNE	11		
		ePPZ	40	52	
		USCGS H	02	26	30.6
		53.4 N	172.4	E	
		Near Island			
		Aleutian Islands			
		depth about 90 km			
14	Ch	ePZ	05	43	37
	Lh	ePZ	45	06	
	Qt	ePZ	34		
		USCGS H	05	32	42.5
		5.4 S	152.9	E	
		New Ireland region			
		depth about 81 km			
14	Lh	ePZ	15	48	08

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961
Major Shocks

Date	Station	Phase	h	m	s
	Wr	ePZ	26		
	Qt	ePZ	46		
14	Wr	iPZ	16	51	07
	Ch	ePZ	08		
		ePcPZ	20		
		ePPN*	54	21	
		eSN*	17	01	12
		eScSN*	26		
	Lh	ePZ	16	51	15 c
	Qt	ePZ	34	c	
		ePPZ	54	51	
		eSKSNE	17	02	01
		iSN*	13		
		eSSN*	07	59	
		USCGS H	16	38	55.6
		53.9 N	163.7	W	
		Unimak Islands region			
		depth about 41 km			
		Mag $5\frac{3}{4}$ (Pal)			
15	Ch	ePZ	04	14	13
	Qt	ePZ	16	25	
		USCGS H	04	06	15.8
		30.0 N	140.4	E	
		South of Honshu, Japan			
		depth about 285 km			
15	Lh	ePZ	20	42	20
		eSN	48	46	
	Wr	ePZ = Δ	42	48	
		USCGS H	20	34	14.3
		5.2 S	110.0	E	

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

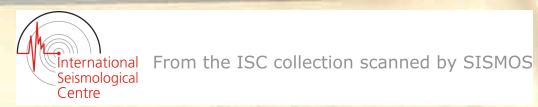
Date	Station	Phase	h	m	s
	Java Sea				
	depth about 565 km				
16	Ch	ePZ	07	28	27
		epPZ		29	03
		ePPZ		30	20
		eSN*		35	02
	Lh	ePZ		29	41 c
		ePPE		31	45
		ePPPE		32	59
		eSNE		37	21
		ePSN			41
		eSSN		40	54
		Mu			Sec
		PZ	2.0		1.2
		$\Delta = 55^\circ 2'$			
	Wr	iPZ		29	50 c
	Qt	ePZNE		30	23 c
		eXZ			38
		ePPZ		32	41
		ePPPZ		34	09
		eSNE		38	39
		ePSNE		39	10
		eSSNE		42	38
		ePKPPKPZ		59	40
		Mu			Sec
		PZ	5.4		2.5
		PPZ	3.3		3.2
		$\Delta = 61^\circ 3'$			
	Kr	ePZ		07	30 42 c
		eSE			39 17

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961
Major Shocks

Date	Station	Phase	h	m	s
	USCGS H 07 20 18.6				
	36.0 N 141.1 E				
	Near east coast of Honshu, Japan				
	depth about 131 km				
	Mag $6\frac{1}{2}$ -7 (Pas),				
	7 (Qt, Lh)				
16	Ch	ePZ	08	56	23 c
	Qt	ePZ		58	23 c
	USCGS H 08 48 17.7				
	35.0 N 141.3 E				
	Near east coast of Honshu, Japan				
	depth about 188 km				
16	Qt	ePZ	10	24	16
	USCGS H 10 14 09.6				
	36.4 N 141.4 E				
	Near east coast of Honshu, Japan				
	depth about 131 km				
16	Ch	ePZ	11	27	54 c
		epPZ		28	34
		esPZ			54
		ePPZ		29	46
		eSN*		34	30
		ePPSN*		35	12
	Lh	ePZ		29	08 c
		eSNE		36	46
	Wr	iPZ		29	17 c
	Qt	ePZ			52 c

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Date	Station	Phase	h	m	s
		eXZ		30	03
		ePPZ		32	07
		eSNE		38	11
		Mu			Sec
		PZ	0.6		1.9
		PPZ	0.5		2.1
		$\Delta = 62^\circ 0'$			
	Kr	ePZ		11	30 09 c
	USCGS H 11 19 46.5				
	35.7 N 140.6 E				
	Near east coast of Honshu, Japan				
	depth about 157 km				
	Mag 6.1 (Qt)				
16	Ch	ePZ	11	49	14
	Lh	ePZ		50	31
	Wr	iPZ			39 c
	Qt	ePZ		51	15 c
	USCGS H 11 41 06.2				
	35.2 N 141.0 E				
	Near east coast of Honshu, Japan				
	depth about 149 km				
16	Ch	ePZ	12	20	45
		esPZN*		21	16
		ePPZN*		22	33
		ePPPZ		23	18
		eSN*		27	14
	Lh	ePZ		21	58
		e(S)E		29	38



Major Shocks

Date	Station	Phase	h	m	s
	Wr	ePZ		22	07
	Qt	ePZ			43 c
		ePPZE		25	05
		e(S)NE		31	10
		ePKPPKPZ		52	03
		Mu			Sec
		PZ	0.9		2.0
		$\Delta = 61^\circ 6'$			
	Kr	ePZ		12	3 00
		eSE			31 24
	USCGS H 12 12 34.4				
	36.2 N 141.7 E				
	Near east coast of Honshu, Japan				
	depth about 105 km				
	Mag $6\frac{1}{2}$ - $6\frac{3}{4}$ (Pas), 6.4 (Qt)				
16	Ch	ePZ		13	17 25
	Wr	iPZ			18 49 c
	Qt	ePZ			19 25 c
		ePPZ			21 44
	USCGS H 13 09 17.7				
	35.6 N 140.8 E				
	Near east coast of Honshu, Japan				
	depth about 144 km				
16	Ch	ePZ		14	12 13 c
	Lh	ePZ			13 29
		ePPE			15 33
		ePPPE			16 47
	Wr	ePZ			13 37
	Qt	ePZ			14 13 c

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Date	Station	Phase	h	m	s
		epPZ			45
		ePPZ	16	31	
		ePPPZ	18	06	
		eSNE	22	18	
		esSNE	23	08	
		e(PKPPKP)Z	43	35	
		Mu Sec			
		PZ	0.6	2.0	
		$\Delta = 60^{\circ}.5$			
	Kr	ePZ	14	14	28
		USCGS H	14	04	05.3
		36.3 N	141.2	E	
		Near east coast of			
		Honshu, Japan			
		depth about 127 km			
		Mag 6.2 (Qt)			
16	Ch	ePZ	14	52	23
	Lh	ePZ		53	38
	Wr	ePZ			47
	Qt	ePZ		54	23 c
		USCGS H	14	44	15.1
		36.7 N	141.8	E	
		Honshu, Japan			
		depth about 108 km			
16	Qt	ePZ	15	36	22
		USCGS H	15	26	21.2
		36.5 N	141.2	E	
		Near east coast of			
		Hodshu, Japan			
		depth about 143 km			

Major Shocks

Date	Station	Phase	h	m	s
16	Ch	ePZ	15	49	27
		epPZ			53
		ePPZN*	51	19	
		e(S)N*	56	04	
	Lh	ePZ	50	42	
		e(S)NE	58	54	
		ePSE			46
	Wr	ePZ	50	50	
	Qt	ePZ	51	27	c
		epPZ	52	01	
		ePPZ	53	45	
		e(S)NEN*	59	56	
		ePSNE	16	00	12
		ePPSNE			20
		ePKPPKPZ	20	51	
		Mu Sec			
		PZ	2.5	2.7	
		PPZ	1.3	2.5	
		$\Delta = 61^{\circ}.8$			
	Kr	ePZ	15	51	42 c
		USCGS H	15	41	23.3
		36.4 N	140.6	E	
		Near east coast of			
		Honshu, Japan			
		depth about 147 km			
		Mag 6.7 (Qt)			
16	Qt	ePZ	18	18	58
16	Lh	ePZ	21	47	05
	Wr	ePZ			13
		iSN			48 39

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Date	Station	Phase	h	m	s
	Qt	ePZ			21
		eSN	50	41	
		H	21	45	21
		36 N	80	E	
		Sinkiang Province,			
		China			
17	Ch	ePZ	00	37	45
	Lh	ePZ		39	03
	Qt	ePZ			46 c
		USCGS H	07	29	35.7
		36.5 N	141.8	E	
		Near east coast of			
		Honshu, Japan			
		depth about 100 km			
17	Wr	ePZ	06	51	11
	Qt	ePZ			47
		USCGS H	06	41	36.8
		36.2 N	141.6	E	
		Honshu, Japan			
		depth about 99 km			
17	Ch	ePZ	23	18	12
		eSN*			28 58
		USCGS H	23	05	32.5
		21.4 S	169.3	E	
		Loyalty Islands region			
		depth about 95 km			
17	Kr	ePnZ	23	49	23
		eSnE			52
		iSgE			57
	Qt	ePnZ			38

Major Shocks

Date	Station	Phase	h	m	s
		ePgZN			51
		eSnNEN*	50	17	
		H	23	48	43
		Near Dadu,			
		West Pakistan			
18	Qt	ePZ	07	22	55
		USCGS H	07	12	46.0
		36.1 N	141.4	E	
		Near east coast of			
		Honshu, Japan			
		depth about 100 km			
18	Qt	ePZ	07	38	03
		USCGS H	07	27	46.6
		34.9 N	142.2	E	
		Near east coast of			
		Honshu, Japan			
		depth about 100 km			
18	Wr	ePZ	09	44	33
		iSZ			45 10
	Qt	ePZ			39
		eSNE			47 08
		H	09	43	43
		Northern Afghanistan			
18	Qt	ePnZ	14	34	26
		eSnNE			58
		eSgNE			35 10
	Kr	ePZ			15
		eSE			36 26
		H	14	33	42
		Suleman Range			
		West Pakistan			

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
18	Ch	ePZ	16	56	39			Alaska			
	Lh	ePZ		57	57			depth about 55 km			
	Qt	ePZ		58	43	20	Qt	ePZ	08	27	21
		USCGS H 16 48 34.5				20	Ch	ePZ	09	02	36
		35.9 N 141.7 E						USCGS H 08 50 34.0			
		Near east coast of						59.4 N 154.3 W			
		Honshu, Japan						Southern Alaska			
		depth about 137 km						depth about 91 km			
19	Ch	ePZ	17	32	08 c	20	Wr	ePZ	17	21	35
		epPZ		18			Lh	ePZ		44	
		esPZ		22			Ch	eSNE		32	00
		ePPZ		34	18			ePZ		21	57
		eSZ		40	03			ePPZ		25	10
		esSZ		21				eSN*		32	21
	Lh	ePZ		32	35		Qt	ePZ		22	03
		ePcPZ		33	17			epPZ		16	
	Wr	ePZ		32	35			ePPZNEN*		25	28
	Qt	ePZ		33	12 c			e!SKSNN*		32	30
		ePPZ		35	43			iSN*		46	
		eSNE		42	08			ePSN*		53	
		USCGS H 17 22 16.9						ePPSN*		34	16
		49.7 N 155.8 E						eSSN*		38	35
		Kurile Islands						Mu Sec			
		depth about 31 km						PZ 0.3 1.5			
		Mag 5.4-6.2 (Pal)						PPZ 0.4 2.0			
20	Qt	ePZ	01	09	45			$\Delta = 88^\circ$			
		USCGS H 00 56 59.7						USCGS H 17 09 15.7			
		56.5 N 152.1 W						56.4 N 152.3 W			
		Near Kodiak Island,						Kodiak Island, Alaska			
								depth about 46 km			
								Mag 6.2 (Pas), 6.3 (Qt)			

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
20	Ch	ePZ	20	59	38		Wr	ePZ		37	55
	Lh	ePZ		21	03 07		Kr	ePZ		38	10
	Wr	ePZ		40				eSKSE		48	52
	Qt	ePZ		04	08		Qt	ePZ		38	12
20	Ch	ePZ	22	42	59			ePPZE		42	42
	Lh	ePZ		44	12			eSKSNEN*		48	53
	Wr	iPZ		21	c			e!SKKSEN*		49	21
	Qt	ePZ		58	c			eSEN*		58	
	Kr	ePZ		45	15			iXN*		51	59
		USCGS H 22 34 51.1						iPPSN*		52	51
		38.1 N 141.2 E						iSSN*		57	20
		Near east coast of						USCGS H 03 24 04.5			
		Honshu, Japan						11.9 S 166.2 E			
		depth about 52 km						Santa Cruz Islands region			
21	Qt	ePKPZ	15	07	10			depth about 25 km			
		USCGS H 14 47 57.0						Mag 7 (Pas), 6.4-6.2 (Berk)			
		8.6 N 82.8 W				22	Wr	iPZ		10	04 12
		Costa Rica - Panama						iSE		39	
		border region					Qt	ePZ		05	11
		depth about 40 km						eSZNE		06	23
22	Qt	ePZ	02	19	31			H 10 03 37			
22	Ch	ePZ	03	36	22			Hindukush			
		ePcPZ		28		22	Qt	ePKPZ		16	28 38 d
		ePPZ		39	31			USCGS H 16 09 37.3			
		ePPPZ		41	21			28.5 S 174.8 W			
		eSN*		46	34			Kermadec Islands region			
		eScSN*		48				depth about 68 km			
		ePSN*		47	22	22	Qt	ePZ		18	11 08
	Lh	ePZ		37	45	22	Wr	ePZ		19	32 03
		eSKSE		48	13		Qt	ePZ		24	

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H	19	22	51.0	24	Ch	ePZ	07	37	14
		10.9 N	124.6	E				epPZ		38	08
		Leyte, Philippine Islands						ePPZ		40	39
		depth about 185 km						eSN*		47	25
23	Qt	ePZ	02	43	45			esSN*		49	00
23	Ch	ePZ	04	57	09			USCGS H	07	25	03.5
	Lh	ePZ		58	01			15.6 S	167.6	E	
		eSE	05	05	39			New Hebrides Islands			
	Wr	ePZ	04	58	07			region			
	Qt	ePZ			45			depth about 198 km			
		ePPZE	05	00	55	24	Qt	ePZ	11	10	08
		eSNE		07	06	24	Qt	ePZ	15	46	31
	Kr	ePZ	04	59	04	24	Qt	ePZ	17	59	47
		USCGS H	04	48	21.4	24	Qt	ePZ	22	31	36
		42.9 N	145.3	E		24	Qt	ePZ	23	31	58
		Hokkaido, Japan						USCGS H	23	12	49.0
		depth about 46 km						8.3 N	82.9	W	
23	Kr	ePZ	09	49	03 d			Panama-Costa Rica			
	Qt	ePZ			52 d			border			
	Wr	ePZ			50 34			depth about 78 km			
23	Qt	ePnZ	23	33	38 c	25	Lh	ePZ	01	02	15
		ePgZNE			48			eXZ			29
		eSnZNE	34		17			eSE			08 50
		eS*E			24			iPZ			02 46
		eSgZNE			33		Wr	ePZ			47
	Wr	iPgZ			03		Qt	ePZ			47
	Kr	ePZ			21			eXZ			59
		H	23	32	46			ePPZ			04 38
		30 N	70.5	E				USCGS H	00	54	09.2
		Near Dera Ghazi Khan,						4.9 S	102.7	E	
		West Pakistan									

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Near west coast of						Qt	ePZ		56 d
		Sumatra						USCGS H	01	47	01.4
		depth about 135 km						15.3 N	93.7	E	
25	Ch	ePZ	05	33	44			Southern Burma			
		USCGS H	05	21	42.2			depth about 67 km			
		141 S	165.4	E		26	Wr	iPZ	10	56	11 d
		New Hebrides Islands						iSZ			44
		depth about 195 km						Qt	ePZ		57 04
25	Qt	ePZ	09	26	14 d			eSNE			58 19
25	Qt	ePZ	16	12	39			H	10	55	26
25	Ch	ePZ	17	27	41			Hindukush			
	Lh	ePZ			29 55	26	Ch	ePZ	16	26	11
		eSN			37 21			eSN*			36 55
	Wr	ePZ			30 18			Qt	ePKPZ		31 47
	Qt	ePZ			33			USCGS H	16	13	25.1
		eSNE			38 37			21.4 S	169.5	E	
		USCGS H	17	20	34.7			Loyalty Islands			
		1.2 N	121.3	E				depth about 119 km			
		Celebes						Mag 6-6.5 (Berk), 6.5 (Pas)			
		depth about 56 km				26	Lh	ePZ	16	47	39
25	Wr	ePZ	19	14	33			eSNE			48 43
	Lh	ePZ			34			Qt	ePZ		47 52
	Qt	ePZ			15 10			eSNE			49 07
		USCGS H	19	04	22.8			H	16	46	14
		49.8 N	156.0	E				Afghanistan			
		Kurile Islands				26	Ch	ePZ	19	01	41
		depth about 98 km						Qt	ePKPZ		07 22
26	Lh	ePZ	01	52	13			USCGS H	18	48	56.9
		eSE			56 31			20.7 S	169.5	E	
	Wr	ePZ			52 45			Loyalty Islands region			
								depth about 77 km			

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Major Shocks

Date	Station	Phase	h	m	s	
27	Lh	ePZ	01	04	50	
		eSKSE		15	08	
		Mu	Sec			
		PZ	0.2	1.2		
		$\Delta = 84^\circ \cdot 1$				
	Qt	ePZ	01	05	21 c	
		ePPN		08	55	
		eSKSE		15	46	
		eSKKSNE		16	00	
		eSNE			13	
	Mu	Sec				
	PZ	0.2	1.3			
	$\Delta = 91^\circ$					
	USCGS H	00 52	14.6			
		6.4 S	154.7 E			
		Solomon Islands				
		depth about 23 km				
		Mag 6.3 (Qt, Lh)				
27	Ch	ePZ	20	16	15	
	Lh	ePZ			53	
	Wr	iPZ			57 d	
	Qt	ePZ			17 34 d	
	USCGS H	20 07	00.4			
		45.4 N	149.3 E			
		Kurile Islands				
		depth about 60 km				
28	Qt	ePKPZ	03	44	08	
		ePPZ		47	22	
		ePKSZE			47	
	Wr	ePKPZ		44	13	
	Lh	ePKP ₂ Z			43	

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Major Shocks

Date	Station	Phase	h	m	s
29	Qt	ePZ	00	30	02 c
		USCGS H	00 18	39.7	
		5.8 S	131.8 E		
		Aroe Islands			
		depth about 47 km			
29	Ch	ePZ	13	35	32
	Qt	ePZ			36 11
	USCGS H	13 23	54.7		
		51.8 N	175.9 W		
		Andreanof Islands			
		Aleutian Islands			
		depth about 41 km			
30	Qt	ePZ	03	47	13
30	Qt	ePZ	11	30	14
30	Wr	ePZ	12	24	24
	Qt	ePZ			52
		eSE			34 59
	USCGS H	12 12	39.7		
		65.2 N	149.9 W		
		Central Alaska			
		depth about 34 km			
		Mag 5.5 (Pal)			
30	Wr	ePZ	22	56	45
	Qt	ePZ			57 35
31	Wr	iPZ	01	00	59 c
	Lh	ePZ			01 04
		ePPZ			04 14
		eSE			11 23
		ePSN			12 24
	Ch	ePZ			01 09

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	Quetta		9	ePZ	07 58 43
1	ePgN	02 05 55.1		eSNE	59 57
	eSgNE	06 07.5	9	ePZ	08 23 58
3	ePgZ	00 54 32		eSN	25 37
	eSgN	46	10	ePZ	02 36 42
3	ePgZ	03 44 55	10	ePgZ	05 00 28
	eSgNE	59		eSgN	39
3	ePZ	14 00 45	11	ePZ	05 33 06
3	eXZ	16 25 43	11	eXE	19
3	ePgZ	16 25 54		eSNE	26
	eSgNE	26 10	11	ePZ	05 57 15
4	ePZ	09 00 12	11	ePZ	08 24 01
4	ePZ	23 12 29	11	ePZ	19 46 09
	eSZNE	13 52		eSNE	30
5	ePZ	04 35 47	12	ePZ	17 44 01
	eSN	36 12		eSN	44
5	ePZ	12 35 34	12	eXZ	19 11.0
	eSNE	59	12	eXZ	19 34.0
5	iPZ	16 11 54	13	ePgZ	03 46 42.9
5	ePgZ	20 48 47 d		iSgNE	45.7
	eSgNE	59	13	ePgZ	07 54 00.0
6	ePZ	08 52 31		eSgZNE	05.6
	eXZ	58 12	13	ePZ	09 47 42
6	ePZ	22 01 08		eSNE	48 07
	eSN	29	13	ePZ	18 03 36
7	ePZ	13 05 41		eSE	05 37
	eXZ	50	13	ePZ	18 25 05
7	iPgZ	17 36 53.5 c		eSNE	26 32
	iSgZN	57.2	13	ePZ	18 35 44
7	ePZ	19 33 50		eXZ	36 00

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
13	eXZ	20 14 23		eXZ	42 03
	ePZ	43		eSZNE	41
	eSNE	16 01	19	iPgZ	21 13 15.0
14	eXZ	09 15 49		iSgNE	19.0
14	ePZ	20 48 46	20	ePZ	06 35 59
14	ePgZ	20 59 13.1		eSN	36 17
	eSgE	15.8	20	iPgZ	10 28 26.1 c
15	eXZ	11 32 00		iSgNE	27.5
15	eXZ	12 05 00	20	eXZ	11 55 02
15	eXZ	20 40 00		ePZ	06
15	eXZ	21 00 00	20	ePZ	13 21 06
16	ePZ	20 46 30		eSN	23 09
17	ePZ	00 27 18	20	ePZ	15 02 55
	eSN	28 48		eSZNE	03 22
17	ePZ	12 40 50	20	eXZ	20 16 56
	eSZN	41 18	20	ePgZ	20 43 59.7
17	ePZ	23 34 46 ±		eSgN	44 10.0
	eXZ	48	20	ePZ	21 53 37
18	ePZ	14 48 30	21	ePgZ	05 00 06.7
	eXE	46		iSgN	21.3
18	ePZ	22 10 05	21	iPgZ	08 35 26.4 c
	eSN	39		iSgZN	29.5
18	ePZ	22 35 55	21	ePZ	21 32 31 ±
	eSN	36 16		e(S)E	33 37
19	ePgZ	01 05 59	22	ePgZ	00 36 59.3
	eSgN	06 12		eSgN	37 14.2
19	ePZ	04 24 32	22	ePZ	08 27 09
19	ePZ	04 36 43.3		eSNE	29 25
	eSN	37 09.1	22	ePZ	16 39 15
19	ePZ	20 41 25		eSN	40

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
22	ePgZ	16 54 23.6	25	ePgZ	06 53 25.4
	eSgN	26.4		eSgZN	39.4
22	ePZ	19 22 36	25	eXZ	08 39.0
	eSN	53	25	eXZ	10 06.0
22	ePZ	19 23 08	26	ePZ	01 32 26
	iSN	26		eSNE	46
22	ePgZE	19 30 59	26	eXZ	14 18.0
	eSgNE	31 15	26	ePZE	19 16 05
23	ePgZ	00 21 51.0		eXZ	10
	eSgN	53.8	26	eXZ	20 50.0
23	ePZ	00 27 27	27	ePgZN	07 52 26.0
	e(S)N	55		eSgZN	27.4
23	ePZ	00 48 58	28	ePZ	01 13 44
	eSN	49 30	28	ePZ	10 14 06
23	eFZ	03 57 24	28	ePgZ	16 23 25.8
23	ePZ	06 47 00 ±		eSgZN	28.0
	eSN	48 15	28	ePZ	16 57 43
23	ePZ	10 50 01		e(S)N	17 00 09
23	ePZ	14 01 49	28	eXZ	19 11.7
23	eXZ	16 14.0	28	eXZ	19 16 55
23	ePgZ	22 02 08.2	29	ePZ	00 59 59
	eSgN	10.7	29	ePZ	03 10 28
23	eXZ	23 48.0		e(S)NE	11 34
24	eXZ	06 30.0	29	ePZ	03 35 17
24	eXZ	08 16.0	29	ePZ	05 37 09
24	ePZ	10 23 43		eSN	35
	e(S)N	24 30	29	eXZ	07 32.0
24	eXZ	19 48.0	29	ePZ	13 24 20
24	ePZ	20 11 58	29	ePZ	18 30 13
	eSNE	29		eSN	31 19

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
30	ePZ	04 57 28	4	ePZ	16 24 39
	eSN	58 04		iSZ	25 19
30	ePZ	05 07 27	4	ePZ	18 38 55
30	eXZ	06 51.0		iSZ	39 36
30	ePZ	21 16 47	4	iPZ	20 55 19 d
	eSN	17 13		iSZ	50
31	eXZ	02 57.0	4	iPZ	23 11 31 c
31	ePgZ	04 36 20.7		iSZ	12 05
	eSgNE	31.5	5	iPZ	01 51 53 d
31	ePgZ	04 38 29.2	5	ePZ	05 17 27
	eSgN	40.4		iSZ	56
31	ePZ	10 27 28	5	ePZ	18 12 11
	eSN	28 29	6	ePZ	07 17 12
31	ePZ	16 27 10	6	ePZ	07 48 58
31	ePZ	16 48 01.1		iSZ	49 38
	eSN	39.0	6	iPZ	11 45 22 d
31	ePZ	18 25 47		iSZ	49
	eSN	26 04	6	ePZ	20 33 50
31	ePgZ	21 02 22	7	iPZ	04 53 24 c
	eSgZN	37		iSZ	54 05
	Warsak		7	ePZ	13 00 53
2	ePZ	18 43 07		eSZ	01 25
2	iPZ	22 08 35 d	8	iPZ	16 32 59 d
	iSZ	09 16		iSZ	33 39
3	ePZ	01 09 06	8	iPZ	21 58 31 d
3	ePZ	11 41 06		iSZ	59 04
	iSZ	52	9	iPZ	07 57 42 c
3	ePZ	12 00 31		iSZ	58 12
4	iPZ	04 46 52 c	9	ePZ	08 28 11
	iSZ	47 31		iSZ	47

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
9	ePZ	20 50 05		iSZ	49 23
11	iPZ	03 07 01 d	16	iPZ	01 01 23 d
	iSZ	33	16	ePZ	20 18 09
11	ePZ	19 48 28		iSZ	50
12	iPZ	09 39 55 c	17	iPZ	00 26 14 d
	iSZ	40 24		iSZ	47
12	iPZ	11 16 25 c	17	ePZ	01 30 32
	iSZ	47	17	iPZ	01 52 07 d
12	ePZ	17 44 05		iSZ	44
12	iPZ	19 09 11	17	ePZ	09 34 30
13	ePZ	02 58 35		iSZ	54
	iSZ	59 07	17	ePZ	20 17 38
13	ePZ	12 51 34		iSZ	18 05
	iSZ	55	18	ePZ	03 05 11
13	iPZ	15 01 44 d		iSZ	45
	iSZ	02 24	18	ePZ	11 55 05
13	iPZ	16 53 42 d		iSZ	35
	iSZ	54 29	18	iPZ	13 38 49
14	ePZ	01 16 48		iSZ	39 11
	iSZ	17 26	19	ePZ	10 32 00
14	iPZ	09 52 19 c		eSZ	30
14	ePZ	15 48 26	19	ePZ	14 56 26
15	iPZ	02 52 04 d	19	ePZ	20 40 34
	iSZ	40		iSZ	41 09
15	iPZ	08 54 14 d	20	iPZ	13 20 53 d
	iSZ	56		iSZ	21 18
15	iPZ	13 29 54 c	20	iPZ	17 51 11 d
	iSZ	30 33	21	ePZ	03 39 51
15	ePZ	17 02 08		iSZ	40 43
15	ePZ	20 48 53	21	iPZ	11 41 33 d

Seismological Bulletin of Pakistan
Volume 7 No. 1, January 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	iSZ	42 07	28	ePZ	11 51 48
21	ePZ	12 22 14		iSZ	52 37
	iSZ	48	28	ePN	22 21 22
21	ePZ	22 32 15		iSN	59
22	ePZ	08 25 58	29	ePZ	12 44 52
22	iPZ	13 35 33 d		iSZ	45 23
	iSZ	36 06	29	ePZ	13 24 45
22	iPgZ	14 30 01 c	29	iPZ	15 46 26 c
	iSgZ	06	30	ePZ	10 48 34
22	iPZ	16 18 26 d		iSZ	49 17
	iSZ	19 06	30	iPZ	11 29 53 d
22	iPZ	19 32 03 c		iSZ	30 14
23	iPZ	06 46 06 c	31	ePZ	01 31 18
	iSZ	42		iSN	45
23	ePZ	12 45 47		Lahore	
	iSZ	46 14	3	eXZ	09 55 34
23	iPZ	23 45 15 d	3	eXZ	18 01 15
24	ePZ	07 41 57	3	ePZ	19 27 21
24	ePZ	11 36 38	3	ePZ	19 37 15
	iSZ	58		eSE	46 07
25	iPZ	12 46 47 c	9	ePZ	07 59 19
25	ePZ	23 48 14	9	e(P)Z	08 22 42
26	iPZ	17 02 00 c	11	eXZ	19 48 22
	iSZ	33	12	ePZ	14 25 46
27	ePZ	22 55 53	16	eXZ	08 57 50
	iSZ	56 30	16	eXZ	13 18 52
27	iPgZ	23 55 21 d	18	eXZ	14 34 58
	iSgZ	29	19	eXZ	15 56 45
28	ePZ	06 12 04	23	ePZ	06 47 46
	iSZ	41	23	ePZ	23 34 10±

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
30	eXZ	12	24	17	18	eXZ	07	20	18
30	eXZ	12	56	16	18	eXN	09	19	32
	Karachi				20	ePZ	11	50	05
5	eXZ	18	16	59	21	eXZ	17	51	15
5	eXZ	18	33	45	23	ePZ	19	29	07
19	eXZ	06	38	58	23	eXN	23	44	46
21	ePZ	07	36	53	25	eXZ	01	03	53
	eSE		37	07	26	eXN	14	16	52
22	eXZ	19	24	18.0	26	eXN	15	44	03
	eSE		25	43.5	27	eXN	14	09	48
23	eXZ	02	42	55	27	eXZ	14	59	06
23	eXZ	18	17	44	28	eXZ	03	44	09
24	eXZ	10	23	32	28	eXN	11	23	40
28	eXZ	11	27	32	28	eXN	19	57	32
30	eSE	15	28	10	30	iPgZ	22	52	50
	Chittagong					iSgZ		53	01
3	eXN	12	58	32					
3	eXN	19	42	14					
3	ePZ	14	05	34					
4	eXN	11	44	20					
5	eXZ	15	20	23					
7	eXZ	10	37	55					
7	ePZ	18	34	56					
8	eXZ	01	23	12 ±					
9	eXN	10	36	35					
9	eXZ	22	22	26					
12	eXN	04	10	00					
13	ePZ	19	30	29					
14	eXZ	02	39	38					
15	ePZ	16	57	47 ±					

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of
PAKISTAN.

Pakistan Meteorological Service, Geophysical Institute, Quetta.

Vol. 7 February 1961 No. 2

CONTENTS

1.	Particulars of Stations and Instruments	...	1
2.	Major shocks	... ..	3
3.	Local and Minor shocks	... ..	25

Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Quetta (Central Station)				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Countd.)

Pakistan Meteorological Service

Director,
Meteorological Service

Sibte Nabi Naqvi

Deputy Director,
Geophysical Institute

.....

Officer Incharge,
Seismic Section

Abdul Qadir Khan

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Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Se =Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki) stand for seismological observatories Pasadena (U.S.A.),
 Berkley (U.S.A.), Uppsala (Sweden) and Kiruna (Sweden) respectively.
 All times are in Greenwich Mean Time.

Seismological Bulletin of Pakistan
Volume 7 No. 2, February 1961

				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
1	Qt	ePZ	05 05 10				
		USCGS H 04 53 44.4					
		11.9 N 143.7 E					
		Mariana Islands region					
		depth about 95 km		2	Qt	ePZ	11 24 52
1	Ch	ePZ	06 39 35			ePcPZ	25 05
		USCGS H 06 27 18.9				epPZ	21
		13.5 S 173.4 E				USCGS H 11 13 31.8	
		East of New Hebrides				13.6 N 145.3 E	
		Islands				Mariana Islands	
		depth about 25 km				depth about 131 km	
1	Ch	ePZ	18 47 11	3	Qt	ePZ	02 33 22
	Lh	ePZ	48 14			USCGS H 02 25 51.5	
	Qt	ePZ	49 01			3.4 N 97.1 E	
		USCGS H 18 39 03.6				Near coast of Sumatra	
		37.4 N 138.4 E				depth about 15 km	
		Near north coast of		3	Qt	ePKPZ	11 22 30
		Honshu, Japan				USCGS H 11 02 51.7	
		depth about 38 km				33.3 S 72.3 W	
2	Ch	ePZ	00 49 08			Near coast of	
		eSN*	54 44			Central Chile	
	Lh	ePZ	51 21			depth about 27 km	
	Qt	ePZ	57	3	Qt	ePKPZ	12 20 04
		epPZ	52 39			USCGS H 12 00 25.3	
		ePcPZ	48			33.2 S 72.2 W	
		ePPZ	54 15			Near coast of	
		eSN	01 00 03			Central Chile	
		eXNE	01 52			depth about 22 km	
		USCGS H 00 42 07.2		3	Qt	ePZ	13 41 52 c
		7.3 N 127.3 E				epPZE	42 17

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPE	44	08				24.7 N 95.3 E			
	USCGS H 13 31		44.7					Northern Burma			
	36.4 N 141.0 E							depth about 162 km			
	Honshu, Japan							Mag 5.8 (Qt)			
	depth about 103 km					4	Ch	ePZ	12	59	08
3	Qt	ePKP ₂ Z	14	26	53		Wr	ePZ			38
	USCGS H 14 07		07.7				Lh	ePZ			39
	33.3 S 73.1 W						Qt	ePZ	13	00	14 c
	Off coast of Chile							epPNE			52
	depth about 25 km							Mu Sec			
4	Ch	iPZN*	08	52	51 d			PZ 0.3 1.6			
	Lh	ePZ		56	09			$\Delta = 66^\circ.7$			
		eSZNE		59	37			USCGS H 12 49			37.7
	Wr	iPZ		56	43 c			50.3 N 156.4 E			
	Qt	ePZ		57	09 c			Kamchatka			
		esPZE			30			depth about 161 km			
		eXNN*			46			Mag 5.9 (Qt)			
		e!PPZE			51	4	Qt	ePZ	15	44	08 c
		ePPPN			58 09			eXZ			47 25
		eSNEN*	09	01	32		Lh	ePZ			44 17 c
		esSZNEN*		02	00		Wr	ePZ			19
		eSSEN*			40	4	Qt	ePZ	16	46	07
		Mu Sec					Lh	ePZ			08
	PZ 0.3 1.5					4	Ch	ePZ	19	15	13 c
	$\Delta = 25^\circ.9$							esPZ			19
	H 08 51 41							ePPZN*			16 02
	25.4 N 96 E							ePPPZN*			15
	Northern Burma							eSN*			19 57
	depth about 60 km						Lh	ePZ			17 15 c
	USCGS H 08 51				48.9			eSN			23 41

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Wr	iPZ	17	35	c			epPKPZ	58	21	
	Qt	iPZ	18	08	c			ePPE	16	00	24
		epPZNE		18				e(PKS)ZNEN*	01	11	
		ePcPZ	19	27			Ch	iPKPZ	15	58	23
		ePPZNE		57				USCGS H 15 38			34.0
		ePPPE	20	57				8.0 N 82.8 W			
		eSNEN*	25	11				South of Panama			
		eScSNE	27	54				depth about 49 km			
		e!XN*	28	16		5	Ch	ePZ	18	01	15
		eLN*	29.6					ePPN*			03 35
		Mu Sec						eSN*			09 46
		PZ 1.4 2.1					Qt	ePZ			02 01
		PN 0.8 2.0						eSN*			11 12
		PE 0.9 2.0						ePPSN*			51
		$\Delta = 49^\circ$						eSSN*			15 44
		USCGS H 19 09			12.9		Lh	ePZ			02 04
		24.0 N 122.7 E					Wr	ePZ			21
		Off east coast of						USCGS H 17 50			51.1
		Formosa						38.4 S 78.2 E			
		depth about 14 km						Indian Ocean			
		Mag 6.7 (Qt)						depth about 25 km			
5	Lh	ePZ	00	08	46	6	Ch	ePN*	04	14	57
	Qt	ePZ		09	26		Qt	ePZ			17 35
		USCGS H 23 58			52.4			USCGS H 04 06			08.9
		45.3 N 148.2 E						14.1 N 145.5 E			
		Kurile Islands						Mariana Islands			
		depth about 25 km						depth about 22 km			
5	Qt	ePZ	02	47	47	6	Qt	ePKPZ	10	49	20
5	Wr	ePKPZ	15	57	44			eXZNE			52 04
	Qt	ePKPZ			48		Lh	ePKPZ			49 29

Seismological Bulletin of Pakistan
Volume 7 No. 2, February 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	USCGS H	10 30	07.2				Qt	ePZ	26	00	c
	19.2 S	68.6 W						epPZE		09	
	Chile-Bolivia border							ePcPZE		34	
	depth about 181 km							eSNEN*	34	34	
6	Ch	ePZ	12	24	03			Mu	Sec		
		eSN*		33	36			PZ	0.4	1.6	
	Lh	ePZ		24	19			$\Delta = 64^\circ \cdot 3$			
	Qt	ePZ			45			USCGS H	18 15	21.6	
		eSN*		35	03			44.8 N	149.1 E		
	USCGS H	12 12	26.0					Kurile Islands			
	51.6 N	174.8 W						depth about 25 km			
	Andeanof Islands					6	Lh	ePZ	19	41	18 c
	Aleutian Islands						Wr	ePZ		31	
	depth about 77 km						Qt	ePZ		46	c
	Mag $5\frac{1}{4}$ - $5\frac{1}{2}$ (Pal)							eSKKSNE	51	40	
6	Qt	ePZ	12	36	19			eSNE		57	
6	Wr	iPZ	14	13	19 c			USCGS H	19 29	33.2	
		iSN			44			4.8 S	154.2 E		
	Lh	ePZ		14	05			Solomon Islands region			
		eSZ		15	03			depth about 470 km			
	Qt	ePZ		14	15 d						
		esPNE			53	6	Qt	ePZ	20	29	46
		eSNE		15	24		Wr	ePZ		30	00
	H	14 12	46			6	Ch	ePZ	21	56	15
	$35\frac{1}{2}$ N	70 E						epPZ		38	
	Hindukush							ePPZN*	58	49	
	depth about 150 km							ePPPZN*	22	00	32
6	Ch	ePZ	18	24	32			eSN*		05	17
	Lh	ePZ		25	20 c		Lh	ePZ	21	57	50 c
		eSN		33	17			eSKSNE	22	08	05
	Wr	iPZ		25	23 c		Wr	ePZ	21	58	03

Seismological Bulletin of Pakistan
Volume 7 No. 2, February 1961

Major Shocks

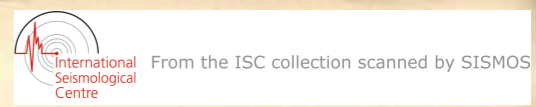
Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
							Qt	ePZ	19		c
								epPZE		33	
								esPE		44	
								ePPNE	22	03	00
								ePPPNE		59	
								eSKKSEN*	08	54	
								eSNEN*	09	13	
								esSN*		39	
								ePSN*	10	39	
								e(SS)N*	15	15	
								eLN*	24.4		
								Mu	Sec		
								PZ	0.9	2.0	
								$\Delta = 92^\circ$			
								USCGS H	21 45	13.5	
								6.8 S	155.3 E		
								Solomon Islands			
								depth about 59 km			
								Mag 6.8 (Qt)			
7	Qt	ePZ	03	02	25						
		eSNEN*		05	57						
7	Lh	ePZ	05	19	57						
	Wr	iPZ		20	24 c						
	Qt	ePZ			25 c						
								USCGS H	05 11	45.0	
								4.1 S	103.3 E		
								Sumatra			
								depth about 82 km			
7	Wr	iPZ		08	43	19					
		iSN			44	10					
	Qt	ePZ			43	40					

Seismological Bulletin of Pakistan
Volume 7 No. 2, February 1961

Seismological Bulletin of Pakistan
Volume 7 No. 2, February 1961 Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
7	Lh	ePZ	22	20	01	8	Qt	ePZ	06	34	20
	Qt	ePZ			34	8	Qt	ePZ	08	22	13
		USCGS H	22	09	41.5		Wr	ePZ			23
		49.3 N	156.3 E			8	Qt	ePKPZ	08	22	30
		Kurile Islands						epPKPZNE	25	05	
		depth about 60 km						ePKSNEN*	26	06	
7	Ch	ePZ	23	38	52			epPPE	28	07	
	Lh	ePZ			39 06		Lh	ePKPZ	22	33	
	Qt	ePZ			30 c		Ch	ePKPZ	23	09	
		USCGS H	23	27	10.8			USCGS H	08	04	13.8
		51.4 N	177.2 W					10.6 S	71.0 W		
		Andreasof Islands						Brazil-Peru border			
		Aleutian Islands						depth about 669 km			
		depth about 15 km						Mag 5.2 (Pas)			
8	Wr	iPZ	01	14	14	8	Lh	ePKPZ	18	08	28
		iSZ			29		Qt	ePKPZ			41
	Lh	ePZ			44			ePPZ	10	11	
		eSN			15 23			USCGS H	17	50	45.2
	Qt	ePZ			30			20.4 S	178.1 W		
		eSNE			16 40			Tonga Islands			
		H	01	13	54			depth about 543 km			
		34.2 N	72.2 E			8	Qt	ePZ	23	04	37
		West Pakistan				9	Lh	ePZ	00	11	50
		depth about 60 km					Qt	ePZ			12 19
8	Qt	ePKPZ	02	54	52			USCGS H	23	59	22.4
		USCGS H	02	36	40.5			7.2 S	154.7 E		
		15.3 S	167.5 E					Solomon Islands			
		New Hebrides Islands						depth about 140 km			
		region				9	Lh	ePKPZ	02	27	03
		depth about 162 km					Wr	iPKPZ			08 c

Seismological Bulletin of Pakistan
Volume 7 No. 2, February 1961



Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	ePKPZ			14 c	10	Qt	ePKPZ	00	56	30
		ePPZN			29 01			USCGS H	00	37	28.0
		ePPPEN*			31 48			30.1 S	177.2 W		
		eSKSNE			34 09			Kermadec Islands			
		ePSN*			39 01			depth about 25 km			
		ePPSZN*			40 39	10	Qt	ePKP ₂ Z	07	42	26
		USCGS H	02	08	15.9		Wr	ePKP ₂ Z			37
		28.2 S	177.4 W					USCGS H	07	23	04.9
		Kermadec Islands region						32.9 S	70.0 W		
		depth about 37 km						Central Chile			
		Mag 6.2 (Pas), 6.1 (Berk)						depth about 230 km			
9	Qt	ePKPZ	13	34	27	10	Ch	ePZ	13	27	40 ±
		ePKP ₂ Z			37			eSN*			34 00
	Wr	ePKP ₂ Z			38		Wr	ePZ			29 57
		USCGS H	13	14	45.6		Qt	ePZ			30 12
		38.9 S	72.6 W					epPZN			32
		Near coast of Chile						ePPZ			32 37
		depth about 25 km						eSN*			38 53
9	Ch	ePZ	20	28	32			eSSN*			43 14
		ePPZ			30 08			USCGS H	13	19	26.6
		eSN*			34 20			2.9 S	127.6 E		
	Lh	ePZ			30 41			Ceram Sea			
	Wr	ePZ			31 07			depth about 78 km			
	Qt	ePZ			11	10	Lh	ePZ	17	08	00
		epPZE			30		Wr	ePZ			30
		eSNEN*			39 08		Qt	ePZ			41
		USCGS H	20	21	20.1			USCGS H	16	58	18.4
		9.9 S	111.3 E					3.5 N	126.1 E		
		Off south coast of Java						East of Celebes Sea			
		depth about 73 km						depth about 25 km			

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
11	Qt	ePZ	02	45	41			e(PKS)ZNE	50	23	
		USCGS H	02	34	37.2			USCGS H	11	27	59.4
		22.9 N	144.2	E				23.3 S	65.9	W	
		Mariana Islands region						Jujuy Province,			
		depth about 60 km						Argentina			
11	Ch	iPZ	06	19	56 d			depth about 195 km			
	Lh	iPZ	21	26	d	11	Qt	ePZ	12	33	53
	Wr	iPZ	38	d				USCGS H	12	23	55.8
	Qt	iPZ	22	11	d			5.2 N	126.3	E	
		eXZE	22					Near coast of Mindanao,			
		ePcPZN	43					Philippine Islands			
		epPZE	23	23				depth about 200 km			
		esPZNE	58			11	Qt	ePKPZ	17	04	54
		eSNN*	30	01				epPKPZ	06	01	
		eScSN*	31	19				esPKPZ	24		
		eSSN*	34	15				USCGS H	16	46	24.6
		Mu Sec						19.8 S	176.2	W	
		PZ 0.5	1.5					Fiji Islands			
		$\Delta = 61^\circ$						depth about 261 km			
		USCGS H	06	12	23.2	11	Lh	ePKPZ	21	19	53 c
		28.8 N	139.5	E			Wr	iPKPZ	57	c	
		North of Bonin Islands						Qt	iPKPZ	20	05 c
		region						ePPZE	21	56	
		depth about 358 km						ePKSN	23	43	
		Mag 5.8 (Qt)						ePPPZN	24	40	
11	Lh	ePZ	09	36	09			eSKSN*	27	01	
	Qt	ePZ	17					eSKSPN*	31	58	
		e(S)E	37	56				ePPSN*	33	25	
11	Qt	esPKPZ	11	48	06			USCGS H	21	01	06.4
		ePPZ	49	56				28.2 S	177.5	W	

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Kermadec Islands						esSN*	10	16	
		depth about 41 km					Lh	iPZ	03	31	c
		Mag $6\frac{3}{4}$ (Pas), (Berk)						epPZ	41		
12	Qt	ePKPZ	01	39	26			eSNE	11	28	
		ePKP ₂ Z	40	51				Mu Sec			
		ePPZ	44	41				PZ 3.6	1.4		
		USCGS H	01	19	21.8			$\Delta = 58^\circ$			
		34.8 S	106.9	W			Wr	iPZ	22	03	36 c
		Easter Island region						eSZ	11	36	
		depth about 100 km					Qt	iPZ	04	14	c
12	Qt	ePZ	10	36	04			ipPZNE	24		
		eSNEN*	39	58				ePcPNE	51		
	Wr	ePZ	36	29				ePPZE	06	38	
12	Qt	ePKPZ	12	27	48			ePPPZ	08	08	
		USCGS H	12	09	22.0			iSZNEN*	12	47	
		15.0 S	175.2	W				esSEN*	13	05	
		Samoa Islands region						ePSN	11		
		depth about 281 km						ePPS	23		
12	Qt	ePZ	15	32	04			eScSNE	14	00	
		USCGS H	15	21	17.9			eLN*	20.1		
		4.1 S	127.3	E				ePKPPKPZ	33	07	
		Banda Sea						Mu Sec			
		depth about 111 km						PZ 2.3	1.9		
12	Ch	iPZN*	22	02	42 c			PN 0.7	1.5		
		ipPZ	53					PE 0.8	1.5		
		isPZN*	03	07				$\Delta = 64^\circ$			
		ePcPZ	50				Kr	ePZ	22	04	36 c
		ePPZN*	04	36				eSE	13	29	
		ePPPZN*	05	40				USCGS H	21	53	43.5
		eSN*	09	55				43.7 N	147.6	E	

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Kurile Islands						Mu			Sec
		depth about 45 km						PZ	0.5		1.4
		Mag $6\frac{3}{4}$ -7 (Pas),						PN	0.3		1.3
		7 (Pal), (Qt), 7.2 (Lh)						PE	0.3		1.3
12	Ch	ePZ	23	00	28			$\Delta = 64^\circ$			
	Qt	ePZ		02	02	13	Kr	ePZ		23	37 27
		USCGS H 22 51 27.7						USCGS H 23 26 34.5			
		43.7 N 148.0 E						44.0 N 147.7 E			
		Kurile Islands						Kurile Islands			
		depth about 17 km						depth about 23 km			
12	Ch	ePZN*	23	35	35			Mag 6.5 (Qt)			
		epPZ			44	13	Qt	ePZ		02	41 42
		ePPN*		37	33			USCGS H 02 31 19.4			
		eSN*		42	47			43.5 N 148.1 E			
		esSN*			59			Kurile Islands			
	Lh	iPZ		36	23 c			depth about 60 km			
		epPZ			30	13	Qt	ePZ		04	53 54
		eSNE		44	22			USCGS H 04 43 24.6			
		ePSN			40			43.8 N 147.4 E			
	Wr	iPZ		36	29 c			Kurile Islands			
	Qt	ePZE		37	05 c			depth about 46 km			
		epPZNE			15	13	Qt	ePKPZ		07	04 22
		ePcPZN			41			USCGS H 06 45 25.0			
		ePPZE		39	24			17.0 S 173.7 W			
		ePPPZ		40	57			Tonga Islands region			
		eSNE		45	39			depth about 43 km			
		esSNE			56			Mag $5\frac{3}{4}$ (Pas), 6 (Pal)			
		ePPSNE		46	15						
		eScSNE		47	00	13	Ch	ePZ		09	15 55
		ePKPPKPZ	00	05	54		Qt	ePZ		17	30 c

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 09 06 55.9				13	Ch	ePZN*	16	36	22
		43.8 N 147.0 E						epPZ			30
		Kurile Islands						esPZ			34
		depth about 25 km						ePPZN*			38 19
13	Qt	ePZ		13	59 11			ePPPZN*			39 19
		USCGS H 13 45 57.7						eSN*			43 37
		6.9 S 155.7 E						esSN*			50
		Solomon Islands					Lh	ePZ			37 14 c
		depth about 25 km						ipPZNE			25
13	Lh	ePZ		16	11 47			eSE			45 08
		iSNE			12 49			esSE			21
	Wr	iPZ			31		Wr	iPZ			37 18 c
	Qt	ePZ			13 09		Qt	ePZ			54 c
		eSZNEN*			15 18			epPZNE			38 04
	Kr	ePZ			13 23 ±			esPN			11
		H 16 10 23						ePcPE			23
		30 N $80\frac{3}{4}$ E						ePPZ			40 12
		India-Nepal border						ePPPNE			41 49
		depth about 33 km						eSNEN*			46 26
		USCGS H 16 10 19.8						ePSN*			50
		29.7 N 81.0 E						eScSN*			47 41
		Nepal-Tibet border						eLN*			53.6
		depth about 35 km						ePKPPKPZ	17	06	45
13	Lh	ePZ		16	27 48			Mu			Sec
	Wr	iPZ			28 09 c			PZ	0.5		1.6
	Qt	ePZ			22 c			$\Delta = 64^\circ$			
		USCGS H 16 17 20.1					Kr	ePZ			16 38 14
		5.1 S 128.7 E						USCGS H 16 27 20.9			
		Banda Sea						43.7 N 149.6 E			
		depth about 66 km						Kurile Islands			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		depth about 25 km						depth about 92 km			
		Mag 6-6 $\frac{1}{4}$ (Pas),				14	Qt	ePZ	02	10	00
		5 $\frac{1}{2}$ -5 $\frac{3}{4}$ (Pal), 6.4 (Qt)						USCGS H 01 57 05.0			
13	Ch	ePZ	17	59	15			6.2 S 154.1 E			
	Lh	ePZ	18	00	05			Solomon Islands			
		epPZ		14				depth about 126 km			
	Qt	ePZ		45		14	Ch	ePZ	03	00	16 \pm
		USCGS H 17 50 16.5					Qt	ePZ		01	37
		44.1 N 147.4 E						USCGS H 02 51 15.3			
		Kurile Islands						44.2 N 147.8 E			
		depth about 42 km						Kurile Islands			
13	Ch	ePZ	21	20	40			depth about 98 km			
	Qt	ePZ		22	11	14	Ch	ePZ	03	24	36 \pm
		USCGS H 21 11 40.9					Qt	ePZ		25	58
		43.6 N 147.8 E						USCGS H 03 15 25.0			
		Kurile Islands						43.8 N 147.4 E			
		depth about 51 km						Kurile Islands			
13	Ch	ePZ	22	46	15			depth about 25 km			
	Lh	ePZ		47	06	14	Ch	ePZ	03	31	00
	Qt	ePZ		47				epPZ			07
		eSNEN*		56	18			ePPZ			32 59
		USCGS H 22 37 12.9						eSN*			38 15
		43.6 N 148.1 E						esSN*			27
		Kurile Islands					Wr	iPZ			31 58 c
		depth about 40 km					Qt	ePZ			32 35 c
14	Lh	ePZ	00	25	25 c			esPZE			49
	Qt	ePZ		26	05 c			ePPNE			34 55
		USCGS H 00 15 40.6						eSNEN*			41 05
		43.7 N 147.5 E						esSN*			20
		Kurile Islands						eLN*			48.2

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Mu Sec						esPZ			36
		PZ 0.3 1.7						ePPZN*			56 16
		$\Delta = 63^\circ.6$						ePPPZN*			57 16
	Kr	ePZ	03	32	56			eSN*	11	01	22
		USCGS H 03 22 00.7						esSN*			50
		43.8 N 147.9 E					Lh	ePZ	10	55	04 c
		Kurile Islands						epPZ			15
		depth about 20 km						eSNE	11	03	02
		Mag 6-6 $\frac{1}{4}$ (Pas), 6.2 (Qt)						ePSN			16
14	Kr	iPZ	03	44	55 c		Wr	iPZ	10	55	07 c
		iSE		45	28		Qt	ePZ			43 c
	Qt	ePZ			14 d			epPZNE			54
		eSZNE		46	01			esPZNE			56 05
		H 03 44 12						ePcPZE			18
		Baluchistan,						ePPZNE			58 03
		West Pakistan						eSNEN*	11	04	06
14	Qt	ePKPZ	06	04	04			ePSN*			39
	Wr	iPKP ₂ Z			17 \pm			eScSN*			05 26
		USCGS H 05 44 24.3						ePKPPKPZ			24 30
		42.3 S 73.1 W						Mu Sec			
		Near coast of southern						PZ 0.6 1.5			
		Chile						$\Delta = 63^\circ.7$			
		depth about 58 km					Kr	ePZ	10	56	04
15	Qt	ePZ	05	09	11			e(S)Z	11	05	00
		eSZNE			37			Mu Sec			
	Wr	ePZ			50			PZ 0.5 1.2			
		H 05 08 36						$\Delta = 67^\circ$			
		Baluchistan,						USCGS H 10 45 15.9			
		West Pakistan						43.7 N 147.4 E			
15	Ch	ePZN*	10	54	13			Kurile Islands			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		depth about 69 km Mag 6-6½ (Pas), 6 (Pal), 6.5 (Qt), 6.3 (Kr)				16	Ch	ePZ	14	03	49
15	Lh	ePZ	11	30	59			esPZ		04	13
		eSNE		32	37		Lh	ePPZ		05	49
	Ch	ePZ		31	26			ePZ		04	41 c
		ePPZ		40				epPZ			49
		esPZ		50			Qt	eSNE		12	37
		eSN*		33	24			ePZ		05	20 c
	Wr	ePZ		31	34 ±			epPZNE			29
	Qt	ePZ		32	22			esPN			43
		eXZE		28				ePcPN			59
		ePPZE		36				eSNEN*		13	52
		esPZE		43				ePSN*		14	12
		eSZNE		35	01			eScSN*		15	12
	Kr	ePZ		32	38 ±			eSSN*		18	00
		H 11 28 56 30¾ N 84¾ E Tibet depth about 60 km USCGS H 11 28 55.0 30.8 N 84.4 E Tibet depth about 66 km						ePKPPKPZ		34	11
								Mu Sec PZ 0.4 1.7 Δ = 64°			
							Kr	ePZ		14	05 41
								USCGS H 13 54 53.7 43.2 N 148.0 E Kurile Islands depth about 71 km Mag 6-6½ (Pas), 6.3 (Qt)			
16	Qt	ePZ	09	04	35	16	Qt	ePZ	14	37	39
		epPZ		05	45		Lh	ePZ		38	34
		USCGS H 08 54 59.9 32.7 N 137.7 E South of Honshu,				16	Ch	ePZ	15	03	23
							Lh	ePZ		04	16

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		epPZ			25			iSN			45
	Wr	ePZ			19		Lh	ePZ			52
	Qt	ePZ			56			eSNE		10	55
		USCGS H 14 54 23.3 43.7 N 147.5 E Kurile Islands depth about 25 km					Qt	iPZ			08 d
								esPZNE			57
								iSNEN*		11	25
							Ch	ePZ		13	22
16	Ch	ePZ	16	16	20			H 13 08 29 36¼ N 70½ E Hindukush depth about 200 km USCGS H 13 08 26.9 36.4 N 70.7 E Hindukush depth about 231 km			
	Lh	ePZ		18	35 c			ePZ		15	48 33
	Wr	iPZ			59 c		Qt	ePZ		15	48 33
	Qt	ePZ		19	04 c			USCGS H 15 37 44.8 5.0 S 129.7 E Banda Sea depth about 254 km			
		USCGS H 16 09 32.4 8.4 S 111.3 E Java depth about 189 km						ePZ		19	07 52
16	Qt	ePZ	17	28	11	17	Qt	ePZ		19	07 52
16	Qt	ePZ	20	39	55			USCGS H 18 55 04.3 4.4 S 153.0 E New Ireland region depth about 108 km			
		USCGS H 20 29 21.4 33.7 S 57.8 E Indian Ocean south of Mascarene Islands depth about 100 km						ePZ		01	13 00
								ePZ			49 c
								epPZ			58
17	Qt	ePZ	06	59	34		Qt	ePZ		14	32 c
		USCGS H 06 48 58.5 43.5 N 148.0 E Kurile Islands depth about 25 km						epPZNE			42
17	Qt	ePZ	12	51	35						
17	Wr	iPZ	13	09	12 d						

Seismological Bulletin of Pakistan
Volume 7 No. 2, February 1961

Date	Station	Phase	h	m	s
		ePPZNE	16	51	
		esSN*	23	19	
	USCGS H	01 04 00.8			
		44.0 N 147.5 E			
		Kurile Islands			
		depth about 28 km			
18	Lh	ePZ	08	32	20
	Wr	ePZ			25
	Qt	ePZ			33 02
18	Qt	ePKPZ	12	24	16
	USCGS H	12 05 36.3			
		22.6 S 171.3 E			
		Loyalty Islands region			
		depth about 38 km			
18	Lh	ePZ	16	03	53
	Qt	ePZ			04 35
	USCGS H	15 54 01.6			
		43.6 N 148.2 E			
		Kurile Islands			
		depth about 25 km			
18	Qt	ePZ	17	14	45 d
		epPZN			53
		esPZE			59
		eSEN*			25 10
		eScSN*			18
	Wr	iPZ			15 04 d
	Lh	ePZ			14
		epPZ			22
	USCGS H	17 02 10.0			
		1.3 S 15.7 W			

Major Shocks

Date	Station	Phase	h	m	s
		Atlantic Ocean,			
		north of Ascension			
		Islands			
		depth about 25 km			
18	Ch	ePZ	20	07	48
	Lh	ePZ			10 00 c
	Wr	ePZ			24
	Qt	ePZ			42 c
		epPZE			59
		ePcPZE			11 23
	USCGS H	20 00 28.7			
		4.3 N 126.6 E			
		Off coast of Mindanao			
		Philippine Islands			
		depth about 74 km			
19	Qt	ePZ	03	41	27
19	Qt	ePZ	12	24	02
	USCGS H	12 11 15.7			
		56.1 N 153.5 W			
		Kodiak Islands,			
		Alaska			
		depth about 39 km			
19	Qt	ePZ	12	46	36
	USCGS H	12 33 41.9			
		14.1 S 13.9 W			
		South Atlantic Ocean			
		depth about 100 km			
19	Qt	ePZ	13	20	32
	USCGS H	13 07 45.5			
		56.1 N 153.4 W			

Seismological Bulletin of Pakistan
Volume 7 No. 2, February 1961

Date	Station	Phase	h	m	s
		Kodiak Island,			
		Alaska			
		depth about 44 km			
20	Qt	ePZ	13	17	57
20	Ch	ePZ	14	28	10
	Lh	ePZ			29 48
	Wr	ePZ			30 04
	Qt	ePZ			20
		epPZNE			43
	USCGS H	14 17 27.3			
		5.0 S 153.4 E			
		New Ireland region			
		depth about 107 km			
20	Wr	iPnZ	17	28	50
		iSnN			29 27
	Lh	ePgZ			02
		eSgZ			42
	Qt	ePnZ			28 58
		ePgZN			29 12
		eSnZN			42
		eSgNEN*			30 00
	H	17 28 00			
		31 $\frac{1}{4}$ N 70 $\frac{3}{4}$ E			
		Near Leiah,			
		West Pakistan			
20	Qt	ePZ	18	44	58
	Wr	ePN			45 14
	Lh	ePZ			15
	Ch	ePZ			27
20	Ch	ePZ	18	50	54

Major Shocks

Date	Station	Phase	h	m	s
	Lh	ePZ	53	25	
	Qt	ePZ			57
	USCGS H	18 46 56.5			
		5.0 N 96.0 E			
		Near north coast of			
		Sumatra			
		depth about 139 km			
20	Qt	ePZ	18	59	46
20	Qt	ePKPZ	22	46	23
	USCGS H	22 27 00.4			
		2.5 S 77.6 W			
		Ecuador			
		depth about 50 km			
21	Qt	ePZ	01	26	53
21	Qt	ePZ	03	09	05
	USCGS H	03 01 55.3			
		36.5 N 23.3 E			
		Near south coast of			
		Greece			
		depth about 49 km			
21	Ch	ePZ	04	01	20
	USCGS H	03 50 27.6			
		6.5 S 154.8 E			
		Solomon Islands region			
		depth about 213 km			
21	Qt	ePZ	19	23	36
	Wr	ePZ			46
	USCGS H	19 10 56.8			
		48.8 S 106.2 E			
		Indian Ocean,			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		about 1000 miles southwest of Australia depth about 52 km						eSNE	59	00	
21	Ch	ePZ	23	35	39		Qt	ePZ	58	18	
	Wr	ePZ		38	19			esPZN	59	08	
	Qt	ePZ			34			eSNE		36	
		ePPZN		40	51			H 21 56 38			
		eSNEN*		46	40			36 N 70 $\frac{3}{4}$ E			
		USCGS H 23 28 34.9						Hindukush			
		0.1 S 123.2 E				22	Lh	ePKPZ	22	12	17
		Celebes					Qt	ePKPZ		30	c
		depth about 183 km						USCGS H 21 53 34.5			
22	Qt	ePZ	03	01	18			28.4 S 177.2 W			
		USCGS H 02 49 18.2						Kermadec Islands			
		51.5 N 179.8 E						region			
		Andreanof Islands,						depth about 78 km			
		Aleutian Islands						Mag 5 $\frac{3}{4}$ (Berk),			
		depth about 99 km						5 $\frac{1}{2}$ -5 $\frac{3}{4}$ (Pal)			
22	Ch	ePZ	15	48	04	23	Ch	ePZ	01	04	48
	Lh	ePZ		50	20		Qt	ePZ		07	57
	Wr	iPZ			50 c	23	Qt	ePZ	03	11	32
	Qt	ePZ			52 c			USCGS H 03 00 05.1			
		ePPZ		52	33			4.4 S 134.1 E			
		USCGS H 15 42 51.9						Off coast of New Guinea			
		0 99.1 E						depth about 60 km			
		Near coast of Sumatra				23	Qt	ePZ	03	25	48
		depth about 36 km						USCGS H 03 19 03.8			
22	Wr	iPZ	21	57	19			35.0 N 27.0 E			
		iSZ			50			Dodecanese Islands			
	Lh	ePZ		59				depth about 10 km			
						23	Ch	iPZN*	04	24	45 c

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		iXZ	25	03				USCGS H 21 45 51.5			
		epPZN*		19				37.3 N 27.5 E			
		ePPN*	26	35				Dodecanese Islands			
		ePPP*	27	29				depth about 25 km			
		eSN*	31	28		24	Ch	ePZ	03	10	30
		ePSN*		56				epPZ			36
		esSN*	32	26				ePPZ			11 31
	Lh	ePZ	25	52 c				ePPPZ			48
		eSNE	33	39				eSN*			15 31
	Wr	iPZ	26	01 c			Lh	ePZ			12 27
	Qt	ePZ		36				ePPZ			14 10
		eXZ		46				eSNE			18 55
		epPNE	27	04			Qt	ePZ			13 19 d
		ePcPZNE		14				esPZE			32
		ePPZNE	28	53				ePcPZNE			14 28
		eSNEN*	34	57				ePPZ			15 20
		ePPSN*	35	31				ePPPZ			16 21
		USCGS H 04 16 25.0						eSNEN*			20 30
		38.2 N 142.7 E						e!ScSN*			22 59
		Off east coast of						eSSN*			24 10
		Honshu, Japan						eLN*			25.5
		depth about 119 km						USCGS H 03 04 11.7			
22	Ch	ePZ	04	56	43			26.1 N 125.4 E			
	Qt	ePZ		59	40			Ryukyu Islands			
		USCGS H 04 49 35.0						depth about 25 km			
		2.4 S 119.9 E									
		Celebes				24	Wr	ePZ	09	52	27
		depth about 25 km					Qt	ePZ			44
23	Qt	ePZ	21	52	37			e(S)N			56 04
	Wr	ePZ		50		24	Qt	ePZ	21	13	25
								eSNE			14 01

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Lh	ePgZ	13	53	±			esSZN*	24	01	
	Wr	ePZ		45			Lh	ePZ	19	29	c
		H 21 12 38						ePPZ	21	23	
		Suleman Range						eSE	26	29	
25	Qt	ePZ	15	04	40			eSSZ	29	46	
25	Qt	ePZ	15	33	10		Wr	iPZ	19	41	c
25	Lh	ePZ	18	59	20		Qt	iPZ	20	16	c
	Qt	ePZ		55				epPZNE		31	
25	Qt	ePZ	19	04	00 d			esPZNE		38	
		iSZNE		27				ePcPZ	21	17	
	Wr	iPZ		37 d				ePPZNE	22	16	
		H 19 03 23						ePPPZE	23	38	
		Afghanistan						eSNEN*	27	53	
26	Wr	ePKPZ	06	08	58			ePSNE	28	09	
		ePPZ		14	33			ePPSNE		23	
	Lh	ePKPZ		08	58			eSSNE	31	41	
	Qt	ePKPZ		59				eLNE	32	·8	
		esPKPZN*		09	18			ePKPPKPZ	50	34	
		ePKP ₂ ZNE		10	42			Mu Sec			
		ePPZE		14	33			PZ 2·0 1·7			
		USCGS H 05 48 46·3						Δ = 55°			
		32·7 S 111·2 W						USCGS H 18 10 48·7			
		Easter Island region						31·4 N 131·2 E			
		depth about 29 km						Near coast of			
26	Qt	ePZ	17	59	35			Kyushu, Japan			
26	Ch	ePZ	18	17	53 c			depth about 54 km			
		epPZ		18	13			Mag 7-7½ (Pas), 7 (Berk),			
		ePPZ		19	19			7½ (Pal), 6·9 (Qt)			
		ePPPZ		42		26	Ch	ePZ	21	07	05 c
		eSZN*		23	27			epPZ		13	

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		esPZ			18						
	Lh	ePKP ₂ Z			41						
		USCGS H 10 29 48·3									
		38·7 S 72·4 W									
		Southern Chile									
		depth about 57 km									
	Lh	ePZ			13 18 30	27	Ch	ePZ			
	Wr	ePZ			36						
	Lh	ePZ			43 c						
	Qt	ePZ			19 06 c						
		epPZNE			18						
		eSNEN*			29 30						
		Mu Sec									
		PZ 0·4 1·5									
		Δ = 52°									
		USCGS H 21 01 04·8									
		16·0 N 121·6 E									
		Luzon,									
		Philippine Islands									
		depth about 32 km									
		Mag 6·1 (Qt)									
27	Qt	ePKPZ	01	26	38	27	Qt	ePKPZ	16	03	28
		USCGS H 01 07 51·3									
		6·7 N 73·0 W									
		Colombia									
		depth about 200 km									
27	Qt	ePKP ₂ Z	10	49	27	27	Qt	ePKP ₂ Z	16	59	34
		eXZ			38						
		epPKPZNE			44						
		ePKSE			53 10						
	Wr	ePKP ₂ Z			49 34						
		USCGS H 16 48 24·9									
		4·2 S 135·3 E									

Seismological Bulletin of Pakistan
Volume 7 No. 2, February 1961

Major Shocks

Date	Station	Phase	h	m	s
		Near coast of New Guinea depth about 100 km			
27	Wr	ePZ	17	54	59
		iSN		55	51
	Qt	ePZ		56	08
		eSNE		57	54
		USCGS H 17 53 35.9 38.4 N 74.7 E Tadzhik, S. S. R. depth about 48 km			
27	Qt	ePZ	18	46	59
27	Qt	ePZ	19	20	48
27	Qt	ePZ	21	46	44
27	Qt	ePZ	22	01	15
		USCGS H 21 54 30.6 36.2 N 26.9 E Aegean Sea depth about 32 km			
28	Qt	ePnZ	06	04	20 d
		ePgZNE			28
		eSnZN*			51
		eS*E			57
		eSgNEN*	05	03	
28	Lh	ePZ	12	43	42
	Qt	ePZ	44	20	c
		epPZE			31
		USCGS H 12 33 32.1 46.5 N 152.2 E Kurile Islands depth about 29 km			

Seismological Bulletin of Pakistan
Volume 7 No. 2, February 1961

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
	Quetta				7	eXZN	21	14	0
					7	ePZ	22	43	09
1	ePZ	07	43	06		e(S)N		44	15
	eSNE			31	8	ePZ	13	08	01
1	e(P)Z	14	42	10	8	ePgZ	17	33	41.2
	e(S)NE			42		eSgZ			49.0
2	ePgZ	00	33	57	9	eXZ	08	17	0
	eSgN			34 10	10	ePZ	09	32	07
2	ePgZ	00	38	57		eSEN			27
	eSgN			39 10	10	eXZ	10	11	0
2	eXZ	15	27	0	10	ePZ	12	55	58
3	eXZ	14	54	56		eSNE			57 45
3	ePZ	15	40	15	10	ePZ	17	36	14
4	ePZ	15	37	05		eSNE			40
4	ePgZ	21	48	38.5	10	ePZ	18	35	22
	eSgNE			48.8		eXZ			33
5	ePZ	00	38	39	10	ePZ	23	35	05
5	ePZ	14	45	24		eSNE			28
6	ePZ	08	53	46	11	ePgZ	01	34	05.6
	eSE			54 15		eSgZNE			10.3
6	ePZ	09	07	02	11	ePZ	05	02	25
	eSNE			08 04		eSN			51
6	eXZ	11	00	12	11	e(P)Z	06	57	52
6	eXZ	11	45	34	11	eXZ	07	02	0
6	ePZN	14	04	20	11	ePZ	17	02	03
	e(S)Z			06 05	11	eXE	21	17	04
7	ePZ	04	18	13	12	ePZ	03	02	09
	e(S)N			19 24		eXZ			04 01
7	ePgZ	06	04	09.1	12	eXZE	20	28	0
	eSgZN			12.1					
7	eXZ	08	02	0	13	iPgZ	05	57	02.4 d

Date	Phase	h m s	Date	Phase	h m s
	iSgZN	06.7	16	ePZ	18 22 28
	iSgN	07.7		eSNE	54
13	eXZ	09 41 07 ±	16	ePgZ	19 57 26
13	ePgZ	10 04 53		eSgN	37
	eSgNE	05 05	16	ePgZ	20 09 45
13	ePN	13 35 51		eSgN	57
	eSN	36 53	16	ePgZ	20 11 36
13	ePZ	18 46 05		eSgN	47
13	ePZ	19 29 38	17	ePZ	01 45 09
	eSNE	55		eSN	46 50
13	ePZ	23 31 31	17	ePZ	05 46 07
	eSNE	33 04		eSN	32
13	ePgZ	23 49 36	17	ePZ	09 44 23 d
	eSgNE	38		eSNE	46 07
14	eXE	04 07 47	17	ePZ	10 44 35
14	ePZ	04 51 50		eSN	45 50
14	ePNE	05 06 59	17	eXN	11 48.0
	eSNE	08 18	17	ePZ	14 56 00
14	ePgZ	05 23 10		eSN	26
	eSgZNE	24	17	ePZ	14 59 12
	eSNE	25		eSZN	39
14	eXE	06 00 13	17	ePZ	15 14 47
14	eXE	13 34 54	17	ePZ	16 39 37
	eXE	35 18		eSNE	40 03
14	eXZ	18 21 51	17	ePZ	18 47 50
15	ePZ	06 29 58		eSN	48 17
	eSNE	30 22	17	ePgZ	21 24 46.9
15	ePZ	20 47 20		iSgNE	47.9
16	ePZ	12 50 32	17	eXZ	22 36.0
	eSNE	58	18	eXZ	08 28.0

Date	Phase	h m s	Date	Phase	h m s
18	ePZ	09 50 18		e ^c gNE	13
	eSNE	51 20	21	eXZ	23 37.0
18	ePZ	10 13 06	22	eXZ	05 39.0
	eSN	25	22	ePZ	13 07 43
18	eXZ	16 54.0	23	ePgZ	07 44 13
18	ePgZ	21 33 43		eSgNE	23
	eSgNE	54	23	ePgZ	07 50 58
19	ePgZ	03 22 44 c		eSgNE	51 08
	eSgNE	54	23	ePgZ	07 57 00
19	ePgZ	03 27 00		eSgNE	09
19	ePgZ	03 58 43	23	ePZ	13 18 19
	eSgNE	53		eSN	19 00
19	ePgZ	12 52 33	23	ePZ	20 03 26
	eSgNE	43		eSZN	04 11
19	ePgZ	22 14 52	24	eXZ	20 36.0
19	ePZ	22 21 02	25	eXZ	02 51 51
19	ePZ	22 46 50	25	eXN	14 07.0
20	ePgZ	00 48 27	25	ePZ	15 47 39
	eSgN	30	25	ePZ	19 19 55
20	ePgZ	01 28 40.0		eSN	20 20
	eSgNE	42.0	26	ePgZ	04 36 46
20	ePZ	19 20 13		eSgZN	56
20	ePZ	21 50 45	26	ePgZ	04 55 36
	eSN	51 05		eSgZNE	46
20	eXZ	23 15 36	26	ePZ	09 46 18
21	ePZ	00 16 30		eSN	35
21	ePZ	02 52 09	26	eXNE	21 02 06
21	eXZ	09 06.0	27	ePZ	01 22 32
21	eXZ	19 16.0		eSZ	40
21	ePgZ	21 11 03			

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
27	e(P)Z	03 35 06	7	ePZ	22 42 39
	e(S)E	37 35	8	ePZ	09 57 00
28	ePZ	07 11 44	8	ePZ	13 24 43
28	ePZ	10 44 28 ±		iSZ	25 03
28	ePZ	12 41 39	8	ePZ	18 08 09
28	ePZ	13 35 55	9	ePZ	02 56 46
28	ePZ	17 41 10		iSZ	57 07
	eSZN	42 39	9	iPZ	20 00 59 c
28	ePgZ	18 17 07.0		iSZ	01 36
	eSgN	09.3	10	iPZ	01 10 50 d
	Warsak			iSZ	11 25
3	iPZ	18 21 24 d	10	ePZ	12 54 43
	iSZ	58		iSZ	55 36
3	ePZ	23 30 05	10	ePZ	17 25 14
4	ePZ	13 51 25		iSZ	56
	iSZ	48	10	ePZ	18 33 05
5	ePZ	15 37 35	11	ePZ	09 20 17
	iSZ	38 03		eSZ	21 27
5	ePZ	16 40 21	11	ePZ	09 56 14
5	ePZ	17 59 04	11	ePZ	09 56 46
6	ePZ	07 48 46	11	ePZ	11 26 00
	iSZ	49 31		iSZ	40
6	ePZ	09 06 37	11	ePZ	18 29 26
	iSZ	07 19	11	ePZ	21 16 31
6	iPZ	12 24 40 d	12	ePZ	06 01 12
6	ePZ	17 35 38	12	ePZ	06 25 24
7	ePZ	06 43 53		iSZ	52
	eSZ	44 34	12	ePZ	08 48 55
7	ePZ	14 14 38	12	iSZ	49 22
			12	ePZ	12 03 33

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	eSZ	04 07		eSZ	30
12	ePZ	12 35 00	15	ePZ	23 02 30
	iSZ	39		iSZ	03 01
12	ePZ	18 18 18	16	iPZ	01 45 45 d
	iSZ	48		iSZ	46 06
13	ePZ	06 59 50	16	ePZ	21 57 52
	iSZ	07 00 13	17	ePN	01 44 32
13	ePZ	09 40 10		iSN	55
	iSZ	57	17	iPZ	09 43 16 d
13	iPZ	10 13 33 d		iSZ	44 05
	iSZ	14 02	17	iPZ	10 43 35 d
13	iPZ	13 34 59 d		iSN	44 05
	iSZ	35 21	19	ePZ	02 31 28
13	iPZ	18 45 39 d	19	iPZ	17 41 36 c
	iSZ	46 06		iSZ	44
13	iPZ	21 48 23 d	19	ePZ	22 14 06
	iSZ	52		iSZ	33
13	iPZ	23 30 28 c	21	iPZ	09 05 44 c
	iSZ	31 05		iSZ	06 15
13	ePZ	23 52 41	21	iPZ	16 41 47 d
14	iPZ	05 06 00 c	21	ePZ	21 04 40
	iSZ	34	22	iPZ	03 20 46 d
14	iPZ	18 19 35 c	22	ePZ	13 06 35
	iSZ	20 07	22	ePZ	21 27 41
15	ePZ	01 21 40	23	ePZ	09 38 16
	iSZ	22 11		eSZ	49
15	ePZ	03 54 12	23	ePZ	13 18 28
	iSZ	55 09	24	iPZ	13 19 47
15	ePZ	08 09 26		iSZ	20 15
15	ePZ	08 20 00	24	ePZ	14 42 32

Seismological Bulletin of Pakistan
Volume 7 No. 2, February 1961

			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
	iSZ	43 03	11	ePZ	23 03 28 d
25	iPZ	12 05 42 c	19	ePnZ	21 28 12.6
	iSZ	06 07		eSnN	40.5
25	iPZ	15 45 17 d	20	ePZ	19 20 17.3
	iSZ	51		eSZ	21 14.2
25	ePZ	18 11 48	22	ePZ	00 37 59
	iSZ	12 26		eSNE	45 32
26	ePZ	03 44 31	22	ePZ	03 20 08
	iSZ	45 00		eSZ	33
26	iPZ	05 38 38	23	ePZ	05 37 48.3
	iSZ	39 14		eSNE	38 09.1
26	iPZ	22 16 02 d	27	ePZ	03 21 53.7
	iSZ	32		iSZNE	22 23.7
27	ePZ	03 22 31	27	ePZ	03 34 17
27	ePZ	03 34 56		eSN	49
	iSZ	35 40	27	ePZ	05 07 51
28	ePZ	17 39 58	27	ePZ	06 41 50
	Lahore		28	ePZ	06 05 55
2	ePZ	11 22 45 c	28	ePZ	17 40 31
2	ePZ	13 42 07 c		eSZN	41 41
2	ePZ	14 27 05 c		Karachi	
3	ePZ	15 41 06	7	ePZ	21 58 17
4	ePZ	01 32 21	10	ePZ	02 27 11
6	ePZ	09 06 33	10	ePZ	20 30 46
	eSZ	58	18	eXZ	09 49 25
6	ePZ	20 49 46	27	eXZ	17 59 30
7	e(P)Z	08 44 36	28	eXZ	06 04 29
10	ePZ	18 36 42 ±		i!SE	05 28
11	eXZ	11 47 17			

Seismological Bulletin of Pakistan
Volume 7 No. 2, February 1961

			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
	Chittagong				
2	eXZ	08 13 44			
3	eXN	03 04 39			
3	eXN	11 28 54			
5	eXZ	00 08 57			
6	ePZ	07 10 55			
6	eXN	19 48 03			
7	eXZ	04 01 45			
7	ePN	12 06 16			
7	ePZ	23 38 52			
9	eXN	02 31 20			
11	eXZ	21 15 54			
12	eXN	03 01 55			
12	eXN	15 35 52			
13	eXN	16 15 48			
13	eXN	16 26 52			
14	eXZ	02 08 15			
15	ePZ	20 43 43			
16	ePZ	03 54 14			
16	ePZ	09 03 10			
18	eXZ	16 03 22 ±			
19	eXZ	08 07 53			
20	eXZ	19 00 13			
22	eXZ	03 00 53			
23	eXZ	03 34 32			
23	eXZ	21 53 38			
25	eXZ	05 26 29			
26	eXZ	06 10 00			
27	eXZ	10 49 48			
28	eXZ	12 42 39 ±			

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 Meteorological Service
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Vol. 7 March 1961 No. 3

CONTENTS

1.	Particulars of Stations and Instruments ...	1
2.	Major shocks ...	3
3.	Local and Minor shocks ...	22

Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Quetta (Central Station)				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Countd.)

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore				
Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi				
Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong				
Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak				
Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Se =Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki) stand for seismological observatories Pasadena (U.S.A.),
 Berkley (U.S.A.), Uppsala (Sweden) and Kiruna (Sweden) respectively.
 All times are in Greenwich Mean Time.

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
1	Qt	ePZ	00	34	48						
		USCGS H	00	23	42.5						
		13.2 N	143.2	E							
		Mariana Islands region									
		depth about 221 km				1	Qt	ePZ	14	44	29
1	Lh	ePZ	02	53	29						
		iSN			53						
	Wr	ePN			56						
	Qt	ePZ	54	56	±						
		eSE	56	24							
		H 02 52 56				1	Ch	ePZ	19	35	04
		33 N 75 1/2 E					Lh	ePZ		37	10
		Near Jammu,					Qt	ePZ			47
		West Pakistan									
1	Wr	ePZ	13	22	49						
	Qt	ePZE			52						
		USCGS H 13 13 41.4				2	Qt	ePKPZ	00	23	09
		8.0 S 107.4 E									
		Near coast of Java									
		depth about 33 km									
1	Lh	ePZ	13	58	32						
	Wr	ePZ			49						
	Qt	ePZ	59	02		2	Qt	ePZ	01	46	49
		USCGS H 13 47 37.2				2	Qt	ePZ	12	01	46
		7.5 S 130.0 E									
		Banda Sea				2	Qt	ePKPZ	15	38	47
		depth about 25 km					Wr	ePKPZ			47
1	Wr	ePZ	14	15	14						
	Qt	ePZ			29						
		epPZNE			51						

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		depth about 25 km						Central Chile			
3	Qt	ePZ	05	26	09			depth about 25 km			
		USCGS H 05 15 55.8				4	Qt	ePZ	19	12	21
		42.3 N 143.9 E						USCGS H 18 59 58.2			
		Hokkaido, Japan						51.8 N 167.3 W			
		depth about 60 km						Fox Islands,			
3	Ch	ePZ	06	38	37			Aleutian Islands			
		eSN*	49	27				depth about 99 km			
	Qt	ePKPZ	44	19		4	Ch	ePZ	22	34	00
		eXN*	52	55			Qt	ePZ	36	17	
		USCGS H 06 25 37.9						USCGS H 22 26 01.2			
		22.9 S 171.4 E						37.8 N 141.6 E			
		Loyalty Islands region						Near coast of			
		depth about 27 km						Honshu, Japan			
3	Ch	ePZ	09	56	17			depth about 61 km			
		USCGS H 09 46 16.7				5	Qt	ePZ	01	40	00
		5.7 S 147.4 E						USCGS H 01 26 26.1			
		Near coast of						10.7 S 161.6 E			
		New Guinea						Solomon Islands region			
		depth about 25 km						depth about 99 km			
3	Qt	ePZ	17	51	48			Mag 6½ (Pas)			
3	Qt	ePKPZ	23	10	54	5	Ch	ePZ	19	51	26
		USCGS H 22 51 15.6					Wr	ePZ	53	35	
		44.1 S 74.8 W					Qt	ePZ	52		
		Near coast of southern						USCGS H 19 42 08.0			
		Chile						3.6 S 137.0 E			
		depth about 95 km						New Guinea			
4	Qt	ePKPZ	00	14	40			depth about 25 km			
		USCGS H 23 54 55.6				5	Qt	ePZ	20	25	42
		37.2 S 71.9 W				5	Qt	ePKPZ	21	44	48

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 21 25 55.6						eSN*	36	13	
		20.6 S 176.1 W						isSN*	29		
		Tonga Islands region					Lh	ePKPZ	29	29	
		depth about 58 km					Wr	ePKPZ	33		
6	Ch	ePZ	01	20	49		Kr	ePKPZ	35	d	
	Wr	ePZ	23	24			Qt	ePKPZ	40	d	
	Qt	ePZ	58					esPKPNE	30	08	
		Felt Rangpur						ePPZNE	31	39	
7	Ch	ePZ	02	55	34			epPPZ	32	04	
	Qt	ePZ	57	47				ePPPZ	34	30	
		USCGS H 02 47 25.8						eSKSE	36	51	
		28.8 N 139.1 E						ePSE	41	47	
		West of Bonin Islands						USCGS H 10 10 38.9			
		depth about 25 km						28.2 S 175.7 W			
7	Qt	ePZ	04	27	16			Kermadec Islands region			
		USCGS H 04 16 44.1						depth about 43 km			
		28.0 N 142.8 E						Mag 7¼-7½ (Pas), (Berk),			
		Bonin Islands region						7-7½ (Pal)			
		depth about 123 km				7	Ch	ePZN*	19	19	02
7	Qt	ePZ	05	55	09			epPZN*	12		
7	Qt	ePKPZ	07	02	49			esPZN*	16		
		esPKPZ	03	29				ePPN*	21	25	
		ePPZ	36	38				ePPPZ*	22	53	
		USCGS H 06 43 10.6						eSN*	27	27	
		43.3 S 80.4 W						esSN*	43		
		Off coast of Chile						ePSN*	53		
		depth about 60 km						ePPSN*	28	03	
7	Ch	ePN*	10	24	34			eSSN*	31	37	
		epPN*	47				Kr	ePZ	19	12	
		ePPN*	28	55			Qt	ePZ	45		
		eSKSN*	35	14				epPZN	53		

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		esPZ	20	00				Mu	Sec		
		ePPZNE	22	20				PZ 0.2	1.3		
		ePPPZE	24	00				$\Delta = 90^\circ \cdot 0$			
		iSNEN*	28	55				USCGS H 23 11 59.6			
		ePSNE	29	25				4.7 S 153.2 E			
		eSSN*	33	23				New Britain region			
		eLN*	37.2					depth about 90 km			
Lh		ePZ	19	47		8	Wr	ePZ	00	30	10
Wr		ePZ	20	05			Lh	ePZ			16
		USCGS H 19 08 33.1					Qt	ePZ			38
		38.2 S 78.1 E						USCGS H 00 17 58.4			
		Indian Ocean						52.2 N 165.2 W			
		depth about 30 km						Fox Islands,			
		Mag 6 (Pas)						Aleutian Islands			
7	Ch	iPZ	23	22	40 c	8	Ch	ePZ	03	36	33 c
		epPZ	23	05			Wr	iPZ			38 43 c
		ePcPZ	16				Qt	ePZ			39 01 c
		ePPZ	25	11				USCGS H 03 27 16.2			
		ePPPZN*	26	49				4.0 S 141.8 E			
		eSN*	31	19				New Guinea			
		esSN*	32	04				depth about 217 km			
		eScSN*	24			8	Qt	ePKPZ	13	12	03
Lh		ePZ	24	20	c			ePKP ₂ Z			14
Wr		iPZ	34		c			USCGS H 12 52 28.8			
Kr		ePZ	47		c			40.0 S 74.3 W			
		eSKSE	35	12				Near coast of Chile			
Qt		ePZ	24	50	c	8	Qt	ePZ	17	20	24
		eSKSNEN*	35	19		8	Wr	ePZ	19	55	26
		eSE	37				Qt	ePZ			44

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eXZ	56	36				Aleutian Islands			
		USCGS H 19 45 43.0						depth about 98 km			
		2.2 N 128.3 E				11	Ch	ePZN*	01	41	14 c
		Halmahera						epPZ			24
		depth about 370 km						esPZ			27
8	Qt	ePZ	23	12	20			ePcPZ			42 09
		USCGS H 23 01 55.9						ePPZN*			43 20
		32.5 N 141.7 E						ePPPZN*			44 35
		Off coast of Honshu,						eSN*			48 59
		Japan						esSN*			49 16
		depth about 37 km					Wr	ePZ			41 51
9	Qt	ePZ	02	49	29		Qt	ePZ			42 26 c
9	Kr	ePZ	08	27	45			esPNE			43
	Qt	ePZ	28	15				ePcPZ			54
	Wr	ePZ			42			ePPZN			44 51
9	Qt	ePZ	22	07	56			ePPPE			46 32
9	Qt	ePZ	23	01	16			eSN*			51 14
10	Qt	ePZ	15	46	49			ePSEN*			43
	Ch	ePZ	47	08				ePPSNN*			53
10	Qt	ePZ	16	04	39			ePKPPKPZ	02	10	48
10	Qt	ePKPZ	23	31	30		Kr	ePZ	01	42	52
		USCGS H 23 12 20.4						USCGS H 01 31 34.4			
		10.1 N 83.6 W						48.7 N 154.6 E			
		Near coast of Costa Rica						Kurile Islands			
		depth about 56 km						depth about 26 km			
11	Qt	ePZ	01	39	29	11	Ch	ePZ	07	30	26
		USCGS H 01 27 02.3						USCGS H 07 18 44.9			
		52.9 N 167.3 W						52.8 N 168.6 W			
		Fox Islands,						Fox Islands,			

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Aleutian Islands depth about 40 km						Mag 6.0 (Qt, Kr)			
11	Kr	ePZ	08	46	42 c	11	Qt	ePZ	19	09	44
		eSSE		52	24			eSNEN*		14	36
		Mu Sec					Lh	ePZ		10	39
		PZ 0.4		1.4				H 19 03 39			
		$\Delta = 26^{\circ} \cdot 5$						French Somaliland			
	Qt	ePZ	08	47	06 c	12	Qt	ePZ	10	29	05
		ePPZN			56	12	Wr	ePZ	16	56	33
		eSNEN*			51 57		Qt	ePZ		57	21
		eLN*			53.1	12	Qt	ePKPZ	23	40	38 d
		Mu Sec						USCGS H 23 21 42.5			
		PZ 0.4		1.5				28.4 S 176.0 W			
		$\Delta = 29^{\circ} \cdot 0$						Tonga Islands region depth about 113 km			
	Wr	ePZ	08	47	52			Mag 6.4-6.6 (Berk)			
	Lh	ePZ			59 c	13	Qt	ePZ	04	48	26
		eSE			53 27			USCGS H 04 37 13.4			
	Ch	ePN*			49 47			5.2 S 135.4 E			
		eXN*			51 03			Aroe Islands region depth about 229 km			
		ePPN*			40	13	Ch	ePZ	05	01	58
		ePPP*			52 32		Lh	ePZ		03	38
		eSN*			56 49		Qt	ePZ		04	08
		H 08 41 02						USCGS H 04 51 13.9			
		12 N 43 E						5.2 S 153.3 E			
		French Somaliland						New Britain depth about 25 km			
		Felt Djibouti				13	Wr	ePKPZ	08	22	41
		USCGS H 08 41 00.0									
		11.2 N 43.3 E									
		Near coast of									
		British Somaliland									
		depth about 18 km									

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Qt			52			USCGS H 01 05 06.2			
		ePPN			25 07			42.9 N 140.2 E			
		epPPE			20			Off west coast of			
		esPPEN*			36			Hokkaido, Japan			
		ePKSN			26 04			depth about 147 km			
		epPKSZN			20	14	Qt	ePZ	06	04	08
		esPKSEN*			37	14	Qt	ePZ		12	10 24
	Ch	ePKPN*			22 57			USCGS H 11 58 53.9			
		USCGS H 08 03 43.9						67.8 N 164.9 W			
		19.2 N 107.3 W						Bering Strait			
		Off west coast of Mexico						depth about 78 km			
		depth about 49 km				14	Qt	ePZ		13	57 04
		Mag 6.4-6.6 (Pas)				14	Qt	ePZ		22	23 00
13	Qt	ePZ	19	24	02	15	Qt	ePZ		01	04 39 c
		ePPE			25 19	15	Qt	ePZ		09	31 28 d
		eSN*			29 24			iSNE			45
		eLN*			31.4		Kr	ePZ			32 17 d
	Wr	ePZ			24 24		Wr	ePZ			48 ±
	Lh	ePZ			50			H 09 31 04			
		USCGS H 19 17 16.1						29.4 N 66 E			
		34.4 N 26.5 E						Baluchistan,			
		Crete						West Pakistan			
		depth about 25 km				15	Ch	ePN*		10	25 29
13	Qt	ePKPZ	20	53	56			ePcPN*			26 08
	Lh	ePKPZ			54 06			ePPP*			29 19
		USCGS H 20 35 15.4						eSN*			33 58
		56.2 S 27.2 W						ePSN*			34 16
		Sandwich Islands					Lh	ePZ			27 08
		depth about 56 km					Wr	ePZ			22
14	Ch	ePZ	01	13	25		Kr	ePZ			35
	Qt	ePZ			14 56						

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Major Shocks

Date	Station	Phase	h	m	s
		ePcPZ			38
		eSE		38	07
	Qt	ePZ		27	39
		ePcPZE			42
		ePPZE		30	55
		ePPPZ		32	58
		eSNEN*		38	12
		eScSNEN*			20
		eLN*			50.3
		USCGS H	10	14	55.5
		3.3 S			150.7 E
		New Ireland region			
		depth about			21 km
		Mag 6 (Pas)			
15	Lh	ePZ		13	13 21
	Qt	ePZ			48
		eSKSNEN*			24 14
		USCGS H	13	01	02.2
		4.4 S			152.5 E
		New Britain			
		depth about			99 km
15	Lh	ePZ		16	27 11
	Wr	ePZ			20
	Qt	ePZ			54
		USCGS H	16	17	16.8
		27.5 N			142.9 E
		Bonin Islands			
		depth about			100 km
15	Qt	ePZ		22	26 00

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Major Shocks

Date	Station	Phase	h	m	s
	Kr	ePZ			45 c
	Qt	iPZ			58 c
		epPE		31	12
		esPE			21
		ePPE		33	37
		epPPE			51
		eSNEN*		40	04
		ePPSN*			41 00
		Mu			Sec
		PZ	0.6		1.5
		$\Delta = 70^\circ$			
		USCGS H	11	19	43.5
		6.4 S			130.7 E
		Banda sea			
		depth about			77 km
		Mag 6.3 (Qt)			
16	Ch	ePZN*		13	53 30
		esPZ			55
		ePPZN*		55	15
		ePPPZN*			54
		eSN*		59	52
	Kr	ePZ		55	55
	Wr	ePZ		56	03
	Qt	ePZ			11 c
		epPZNE			26
		esPZN			36
		ePPZNE		58	39
		epPPZN			58
		ePPPNE		14	00 12

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Major Shocks

Date	Station	Phase	h	m	s
	USCGS H	18 21	12.2		
	8.1 S	122.0 E			
	Flores Island				
					depth about 43 km
16	Qt	ePZ	19	00	36
16	Qt	ePZ	19	23	55
16	Qt	ePKPZ	20	24	19
	USCGS H	20 05	27.2		
	23.6 S	176.0 W			
	Tonga Islands region				
					depth about 101 km
16	Qt	ePZ	23	44	20
17	Ch	ePZ	04	59	00
	Qt	ePZ	05	01	42
		ePPSN*	11	01	
	USCGS H	04 51	10.4		
	8.3 S	122.1 E			
	Flores Island				
					depth about 93 km
17	Qt	ePZ	06	20	23
	USCGS H	06 09	46.7		
	8.4 S	121.3 E			
	Near Flores Island				
					depth about 60 km
17	Qt	ePKPZ	10	37	12
		ePKP ₂ ZN			28
	USCGS H	10 17	35.4		
	36.9 S	74.8 W			
	Off coast of Central Chile				
					depth about 70 km

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Major Shocks

Date	Station	Phase	h	m	s
		ePPZE	21	45	
		eSN*	28	00	
		eLN*	35.7		
	USCGS H	02 08	38.5		
	8.2 S	122.0 E			
	Flores Island				
					depth about 35 km
18	Qt	ePZ	06	32	07
18	Qt	ePZ	07	20	08 d
		iSNEN*			34
	Wr	ePZ			45
	H	07 19	33		
	Southern Afghanistan				
18	Qt	ePZ	08	00	37
	USCGS H	07 47	51.2		
	4.8 S	153.8 E			
	New Britain region				
					depth about 157 km
18	Qt	ePKPZ	08	45	47
	USCGS H	03 26	49.0		
	24.3 S	174.2 W			
	Tonga Islands region				
					depth about 25 km
18	Qt	ePZ	10	26	20
	USCGS H	10 16	48.5		
	29.5 N	138.6 E			
	Bonin Islands region				
					depth about 500 km
18	Wr	ePKPZ	15	13	41

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Major Shocks

Date	Station	Phase	h	m	s	
19	Wr	iPZ	05	01	31 c	
	Qt	ePZ	02	07	c	
		ePcPZ		47		
		ePPZE	04	22		
		USCGS H	04	51	52.2	
			40.5 N	142.9 E		
			North of Honshu, Japan			
			depth about 14 km			
19	Wr	iPZ	05	08	16 c	
	Qt	ePZ		19	c	
		eXZNE		34		
		epPZE		54		
		ePPZ	10	19		
		eSNN*	15	34		
		eLN*	21	1		
			USCGS H	04	59	19.3
			6.4 S	105.5 E		
			Soenda Strait			
			depth about 120 km			
19	Qt	ePKPZ	07	33	23	
		eSKSN*	40	01		
			USCGS H	07	14	57.4
				16.0 S	168.2 E	
			New Hebrides Islands			
			depth about 90 km			
19	Ch	ePZ	07	59	08	
	Wr	iPZ	08	01	40 c	
	Qt	ePZ		57	c	
		epPE	02	26		
		ePcPZ		36		

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Major Shocks

Date	Station	Phase	h	m	s
		ePPZ	04	21	
		USCGS H	07	51	35.0
			2.3 N	127.4 E	
			Molucca Passage		
			depth about 83 km		
19	Wr	ePZ	09	28	21
	Qt	ePZ		56	c
		USCGS H	09	18	53.4
			37.2 N	140.7 E	
			Honshu, Japan		
			depth about 115 km		
19	Qt	ePKPZ	10	32	52
		USCGS H	10	13	19.3
			36.7 S	76.2 W	
			Off coast of central Chile		
			depth about 100 km		
19	Ch	ePZ	12	55	13
	Qt	ePZ		57	58
		USCGS H	12	47	17.5
			8.1 S	121.9 E	
			Flores Island		
			depth about 25 km		
19	Qt	ePKPZ	20	52	57
		USCGS H	20	33	55.7
			24.1 S	176.1 W	
			Tonga Islands region		
			depth about 39 km		
20	Ch	ePZ	02	26	22
	Qt	ePZ		28	40

Date	Station	Phase	h	m	s
		USCGS H	02	17	34.5
			21.6 N	145.8 E	
			Mariana Islands		
			depth about 101 km		
20	Qt	iPZ	03	32	15 d
		eXZ		41	
		esPZE		49	
		iSNEN*		37	
			Mu	Sec	
		PZ	0.4	0.8	
			$\Delta = 7^{\circ}3$		
	Kr	ePZ	03	33	17
	Ch	ePZN*		35	32
		epPZN*		36	00
		ePPZN*		14	
		esPZN*		20	
		ePPPZ		27	
		eSN*	39	35	
		esSN*	40	32	
		H	03	30	30
			36.3 N	70.3 E	
			Hindukush		
			depth about 150 km		
			Felt Warsak		
		USCGS H	03	30	27.4
			36.6 N	71.1 E	
			Hindukush		
			depth about 121 km		
			Mag 6.0 (Qt)		
20	Wr	ePKPZ	06	35	27

Date	Station	Phase	h	m	s
	Qt	ePKPZ			30
		ePKSZN*			38 54
		USCGS H	06	16	23.9
			11.5 N	86.3 W	
			Off west coast of Nicaragua		
			depth about 122 km		
			Mag 6-6.4 (Pas)		
20	Ch	ePZ	11	32	57
	Qt	ePZ		36	18
		USCGS H	11	27	05.4
			16.4 N	121.5 E	
			Luzon, Philippine Islands		
			depth about 30 km		
20	Ch	ePZ	11	46	54
	Wr	ePZ		47	34
Qt	ePZ		48	11	
	ePcPZ			55	
		eSNEN*		55	54
		USCGS H	11	38	39.3
			46.3 N	142.7 E	
			Sakhalin Island		
			depth about 354 km		
20	Wr	iPZ	14	01	50
	Qt	ePZ		02	59
		esPZNE		03	31
		eSNE		04	48
Kr	ePZ		03	48	
	eSE			06	14
		H	14	00	38
			35.3 N	77 E	

Major Shocks

Date	Station	Phase	h	m	s
		Northern Kashmir depth about 100 km USCGS H 14 00 29.5 35.5 N 77.9 E Northern India depth about 74 km			
20	Wr	ePKPZ	16	11	43
	Kr	ePKPZ			52
		eXZ		13	23
		eSKSE		18	37
	Qt	ePKPZ		11	52 d
		epPKPZE		12	45
		eXZEN*		13	24
		ePPZ			49
		eSKSN*		18	39
		USCGS H 15 53 09.9 18.4 S 175.2 W Tonga Islands depth about 175 km Mag $6\frac{1}{2}$ - $6\frac{3}{4}$ (Pas), (Berk)			
21	Wr	ePKPZ	00	01	30
	Qt	ePKPZ			37
		USCGS H 23 42 33.9 24.2 S 175.9 W Tonga Islands region depth about 25 km Mag $6\frac{1}{4}$ (Pas), $6\frac{1}{2}$ (Pal)			
21	Wr	iPZ	09	30	01 d
		iSN			47
	Qt	ePZNE		31	10 d

Major Shocks

Date	Station	Phase	h	m	s
		6.5 S 154.7 E Solomon Islands depth about 143 km			
24	Qt	ePZE	11	13	57
		eSNE		15	56
24	Ch	ePZ	19	17	26
	Qt	ePZ		20	32
		USCGS H 19 10 40.6 9.8 N 128.4 E Off northeast coast of Mindanao, Philippine Islands depth about 236 km			
24	Ch	ePZN*	23	05	23 c
		epPZ			38
		esPZ			52
		ePPZN*		07	08
		ePPPZN*			58
		eSN*		11	49
		esSN*		12	36
	Lh	ePZ		06	38 c
		eSE		14	13
	Wr	iPZ		06	47 c
	Qt	iPZ		07	22 c
		epPZE			45
		esPZN			55
		eXNE		09	30
		ePPZ			38
		eSNEN*		15	40
		esSN*		16	15

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Date	Station	Phase	h	m	s
		USCGS H 20 58 41.9 37.1 S 51.6 E Indian Ocean about 800 miles south of Malagasy Republic depth about 137 km			
25	Wr	iPZ	23	38	45 c
	Qt	ePZ	39	50	
		eSNE	41	11	
		H 23 38 04 Hindukush			
26	Wr	ePZ	01	30	34
	Qt	ePZ	31	00	
		USCGS H 01 21 53.3 16.2 N 121.2 E Luzon, Philippine Islands depth about 70 km			
26	Ch	ePZ	14	36	19
		eSN*	41	57	
	Wr	iPZ	39	06	c
	Kr	ePZ	17	c	
	Qt	ePZ	25	c	
		eXE	38		
		ePcPN	40	05	
		ePPE	41	44	
		eSNEN*	47	32	
		ePSN*	48	06	
		esSN*	28		
		eScSN*	52		
		eSSN*	51	28	

Major Shocks

Date	Station	Phase	h	m	s
		eLN* Mu Sec PZ 0.5 1.5 $\Delta = 61^{\circ}5$ USCGS H 14 29 23.8 5.7 N 126.4 E Mindanao, Philippine Islands depth about 147 km Mag 6.2 (Qt)			54
26	Wr	iPZ	19	42	44
		iSZ	43	31	
	Qt	ePZ	50		
		eSNE	45	30	
		H 19 41 40 Tadzhikistan, S.S.R.			
26	Wr	ePZ	20	41	09
	Qt	ePZ	25		
		eSN*	51	34	
		esSN*	53		
		USCGS H 20 29 05.7 3.1 S 146.2 E Bismarck Sea depth about 25 km			
26	Wr	ePZ	23	14	25
	Qt	ePZ	15	12	
		eSNN*	17	57	
		USCGS H 23 11 38.9 30.6 N 84.4 E			

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Date	Station	Phase	h	m	s
		Southern Tibet depth about 24 km			
27	Qt	ePZ	04	33	30
		USCGS H 04 22 48.3 4.8 S 125.1 E Banda Sea depth about 43 km			
28	Ch	ePN*	09	43	19
		epPN*	40		
		esPN*	50		
		ePPN*	44	52	
		ePPP*	45	16	
		eSN*	49	07	
	Lh	iPZ	45	30	c
		eSE	53	09	
	Wr	iPZ	45	54	c
	Kr	iPZ	56	c	
	Qt	ePZ	46	08	c
		ipPZNE	34		
		iPcPZN	49		
		ePPZE	48	25	
		iSNN*	54	21	
		ePSE	50		
		esSNE	55	00	
		eScSNE	45		
		eLNE	10	01.5	
		Mu Sec PZ 3.0 2.0 $\Delta = 62^{\circ}0$			
		USCGS H 09 35 55.4 0.2 N 123.6 E			

Major Shocks

Date	Station	Phase	h	m	s
		Northern Celebes depth about 83 km Mag $6\frac{3}{4}$ (Pas), 7.0 (Qt), (Pal)			
28	Ch	ePN*	12	40	54 \pm
		ePcPN*	41	06	
		esPN*	17		
		eSN*	50	18	
		eSKSN*	50		
	Wr	ePN	40	57	
	Qt	ePZ	41	28	c
		ePcPZN	35		
		epPNE	44		
		ePPZNE	44	38	
		eSZNEN*	51	34	
		esSEN*	58		
		ePSN*	52	32	
		Mu Sec PZ 0.5 1.5 $\Delta = 82^{\circ}0$			
	Kr	iPZ	12	41	49 c
		USCGS H 12 29 12.7 51.7 N 176.2 W Andreanof Islands, Aleutian Islands depth about 60 km Mag $6\frac{1}{4}$ (Pas), (Qt), $5\frac{1}{2}$ (Pal)			
28	Qt	ePZ	14	11	16
		USCGS H 13 59 03.7 52.0 N 176.3 W			

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
28	Qt	Andreas of Islands, Aleutian Islands depth about 89 km ePZ	21	05	14	28	Qt	ePZ	53	52	
		USCGS H 20 54 40.3 8.7 S 121.9 E Flores Island depth about 76 km						USCGS H 06 43 43.3 33.5 N 140.9 E Near east coast of Honshu, Japan depth about 116 km			
28	Qt	ePKPZ	21	21	18 d	29	Wr	ePZ	09	45	00
		eXZ	24	12			Qt	ePZ			14
		ePPZNE	41					USCGS H 09 35 02.1 0.2 N 123.9 E Northern Celebes depth about 84 km			
		ePKSN*	25	08		29	Lh	ePZ	18	19	48
	Lh	ePKPZ	21	26	d		Wr	ePZ			54
		ePKSZ	25	15			Qt	ePZ	20	30	
	Ch	ePKPZ	21	34				USCGS H 18 10 24.4 37.1 N 141.3 E Near east coast of Honshu, Japan depth about 127 km			
		USCGS H 21 01 56.2 22.0 S 68.0 W Chile-Bolivia border region depth about 125 km Mag 6 (Pas)				30	Qt	ePZ	00	27	05
29	Wr	iPZ	00	09	49 c	30	Wr	ePZ	01	32	09
		iSN	10	22			Qt	ePZ			24
	Lh	ePZ		26				USCGS H 01 22 19.1 0.3 N 123.9 E Northern Celebes depth about 159 km			
		eSZ	11	29		30	Qt	ePKPZ	09	08	46
	Qt	ePZ	10	45				USCGS H 08 49 45.6 15.2 S 172.8 W			
		eSNE	12	00							
		H 00 09 07									
29	Ch	Hindukush ePZ	06	51	39						

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
30	Wr	Samoa Islands region depth about 25 km Mag 5 $\frac{3}{4}$ -6 (Pas), 5 $\frac{3}{4}$ (Pal) ePZ	12	05	53	30	Qt	ePZ	06	32	
		USCGS H 12 00 12.8 32.4 N 103.8 E Szechwan Province, China depth about 81 km				31	Ch	ePN*	11	07	47
							Wr	ePZ			57
							Qt	ePZ	08	45	
								USCGS H 11 02 34.9 43.5 N 101.3 E Outer Mongolia depth about 79 km			

Minor Shocks

Minor Shocks

Date	Phase	h m s
	Quetta	
1	ePZ	15 34 01
1	eXZ	15 40 56
1	ePZ	19 01 58
	eSNE	03 43
1	ePZ	22 43 57
2	ePZ	00 35 01
	eSN	28
2	ePZ	07 35 02
	eSN	31
2	ePZ	13 59 08
2	ePZ	14 52 04
	eSN	33
2	ePZ	18 56 51
	eXZ	55
3	eXZ	07 37 50
3	ePZ	08 08 15
	eSN	41
3	ePZ	08 24 45
	eSNE	25 01
3	ePZ	16 49 29
	eSN	43
4	ePZ	10 06 22
4	ePZ	12 43 05
	eSNE	30
4	ePZ	23 44 22
	eSNE	46
5	ePZ	08 11 01
	eSNE	27
5	ePgZ	18 23 18
	eSgN	33

Date	Phase	h m s
5	ePZ	23 01 40
	eSN	02 05
6	ePZ	04 13 36
	eSE	14 46
6	eXN	13 36
6	ePgZ	17 26 36
	eSNE	47
6	ePZ	18 43 19
	eSNE	44 38
6	ePgZ	21 14 06
	eSgNE	19
6	ePgNE	21 47 15.7
	eSgNE	18.7
6	ePgNE	21 48 06.4
	eSgNE	09.0
7	ePZ	01 20 54
7	eXE	03 44
7	eXE	06 01
7	eXE	06 45
7	eXZ	10 27 28
7	eXZ	12 56
7	ePZ	18 55 46
	eSNE	56 14
7	ePZ	19 03 11
	eSN	41
7	ePZ	19 08 07
	eXN	25
7	ePZ	22 38 15
	eSNE	31
7	eXZ	23 00
8	ePZ	03 55 10
	eSNE	40

Date	Phase	h m s
8	ePZ	06 16 26
	eSNE	18 13
8	eXZ	06 53 17
8	ePgZ	16 58 47
	eSgZEN	54
8	ePZ	21 53 11
	eSNE	32
8	eXE	23 42 40
9	eXE	00 15 56
9	ePZ	03 16 01
	eSNE	27
9	eXZ	04 11
9	e(P)Z	04 17 00
9	eXZ	08 53
9	eXZ	09 39
9	ePZE	12 08 14
	eSNE	09 33
9	eXZ	15 30
9	eXE	16 40
9	eXE	17 24
9	eXE	21 03
9	eXE	21 26
9	ePgZE	23 07 06.4
	eSgZE	08 08.7
10	ePZ	03 42 12
	eSNE	38
10	ePZ	06 09 28
	eSE	11 18
10	ePZ	10 45 10
	eSNE	35
10	ePZ	18 24 50

Date	Phase	h m s
	eSN	26 14
12	eXZ	03 08 58
12	ePgZ	05 09 24
	eSgNE	38
12	ePgZ	11 55 41
	eSgN	52
12	ePZ	12 23 32
	eSN	58
12	eXZ	15 35 48
13	ePgZ	06 03 55.2
	eSgNE	59.0
13	ePZ	07 10 24
	eXZ	28
14	e(P)Z	01 42 47 ±
14	ePgZ	06 30 32.4
	eSgNE	48
14	ePZ	07 13 01
14	ePZ	07 14 14
	eSNE	49
14	ePZ	12 24 22
14	ePgE	13 18 46.6
	iSgE	49.2
14	ePZ	13 23 53
	eSZNE	25 57
14	eXZ	15 13 03
14	ePZ	16 34 56
	eSNE	36 14
15	eXZ	02 19

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Minor Shocks

Date	Phase	h	m	s
15	ePgZ	18	04	04
	eSgN			12
15	ePZ	23	18	35
	eSNE			55
15	ePZ	23	31	32
16	ePZ	00	22	13
	eSN			37
16	ePZ	01	47	47
	e(S)NE		48	04
	eSNE			07
16	ePZ	04	50	22
	e(S)NE			36
	eSNE			43
16	eXE	07	25	
16	ePZ	16	38	25
	eSE		39	37
16	eXZ	17	09	
16	eXZ	18	29	58
16	eXZ	18	45	31
16	ePZ	22	31	49
16	eXZ	23	00	
17	ePZ	03	59	19
	eSNE			37
17	ePE	05	13	33
	eSE			58
17	eXZNE	23	10	12
18	ePZ	02	03	04
18	ePZE	05	21	16
	eSNE		22	23
18	ePZ	06	27	16
	eSNE			49

Seismological Bulletin of Pakistan
Volume 7 No. 3, March 1961

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
	eSNE		39	50		eXZ			17 05
22	ePZ	16	16	16	28	ePZ	06	12	23
	eSNE			37	28	ePZ	20	44	51
23	ePZ	00	58	46		eXN			45 42
	eSNE		59	12	29	ePZ	02	55	48
23	ePgE	08	43	22		eXN			57 48
	eSgE			38	29	ePgZ	03	25	17.2
24	ePZ	04	18	33		eSgN			18.9
24	ePE	07	26	08±	29	ePZ	16	27	54
	eSZNE			27 24		eSEN			17
24	ePZE	09	04	32	29	ePZ	16	30	21
	eSE			58		eSEN			47
24	ePE	12	15	56±	29	ePZ	21	37	06
	eSE			17 42		eSN			30
25	ePZ	04	07	13±	30	e(P)Z	07	00	37
	eSE			08 33	31	eXZ	23	38	33
25	ePZ	09	04	38					
	eSNE			05 11					
25	ePgZ	12	37	41.2	1	ePZ	06	35	19
	iSgNE			43.3		eSZ			51
25	ePZ	13	24	04	1	ePZ	08	13	18
26	ePZ	02	01	48		iSZ			54
26	ePZ	04	18	37	1	iPZ	19	00	50 d
	e(S)NE			19 28		iSZ			01 41
26	ePgZ	17	42	58.2	2	iPZ	15	15	15 d
	eSgNE			43 14.6	3	ePZ	17	23	45
27	e(P)Z	00	33	42		iSZ			24 19
27	eXZ	13	27	10	3	ePZ	23	11	52
27	ePgZ	19	15	17.2	6	iPZ	04	12	40 d
	iSgN			30.2		iSZ			13 01
27	ePZ	21	16	59	6	ePZ	17	45	19

Warsak

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
6	iSZ	54		iSZ	29
	iPZ	18 42 22 c	13	iPZ	18 29 51 d
	iSZ	55		iSZ	30 21
7	ePZ	03 33 49	14	ePZ	08 41 42
	iSZ	34 37		iSZ	42 16
7	iPZ	06 42 49 d	14	ePZ	13 22 37
	iSZ	43 17	14	iPZ	16 33 56 d
7	ePZ	07 03 17		iSZ	34 28
8	ePZ	06 15 17	16	ePZ	09 40 47
	iSZ	16 08	16	ePZ	23 44 22
8	iPZ	20 31 17 d	17	ePZ	01 23 27
	iSZ	52	17	eXZ	14 16 49
8	ePZ	21 53 51	18	ePZ	05 20 04
8	ePZ	22 32 04		iSZ	32
9	iPZ	12 07 15 d	18	ePZ	13 48 26
	iSZ	46		iSZ	59
9	ePZ	18 07 19	18	ePZ	18 29 15
9	ePZ	22 07 46		iSZ	38
10	ePZ	06 08 15	18	ePZ	18 52 25
	eSZ	09 15	18	iPZ	20 52 43 d
10	ePZ	09 15 55		iSZ	53 13
	iSZ	16 45	18	iPZ	21 56 56 d
10	iPZ	18 23 47 d		iSZ	57 31
	iSZ	24 41	19	iPZ	18 14 24
11	ePZ	07 15 16		iSZ	15 00
11	iPZ	14 21 49 c	20	iPZ	22 10 29 d
	iSZ	22 24	20	ePZ	23 19 13
12	ePZ	00 47 06	21	ePZ	01 15 41
	iSZ	43		iSZ	16 07
12	ePZ	13 30 20	21	ePZ	03 36 19
12	iPZ	18 16 00 c		iSZ	52

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
21	ePZ	06 16 19		iSZ	38 17
	eSZ	59	30	ePZ	03 34 17
21	ePZ	06 19 04		iSZ	43
	eSZ	44	30	iPZ	05 38 36 d
22	iPZ	07 39 07 c		iSZ	39 01
	iSZ	41	30	ePZ	16 01 29
22	iPZ	14 37 28		iSZ	02 01
	iSN	57	31	ePZ	07 38 02
23	ePZ	11 09 29		iSZ	37
	iSZ	10 03			
24	iPZ	07 24 56 d		Lahore	
	iSZ	25 30	1	eXZ	14 14 46
24	ePZ	12 15 10	1	eXZ	19 01 18
24	iPZ	17 24 11 d		eSZ	02 30
	iSZ	36	2	eXZ	21 00 45 d
24	ePZ	20 26 54	12	eXZ	16 57 52
	iSZ	27 23	14	eXZ	01 14 02
25	iPZ	04 06 14 c	15	ePNZ	21 08 26.3
	iSZ	46		eSZ	49.7
25	iPZ	22 48 45 d	18	eXZ	15 15 02±
26	iPZ	13 40 31 c		eXE	16 37±
	iSZ	41 02	24	ePZ	18 51 45.7 c
26	ePZ	14 31 12		iSZNE	52 14
26	iPZ	15 43 45 d	19	ePN	05 00 30±
	eSZ	44 13	28	ePZ	12 40 55 c
27	ePZ	00 32 24		eSE	50 31
27	ePZ	00 50 37			
28	ePZ	20 45 05		Karachi	
28	ePZ	21 21 47	7	ePZ	10 05 40
29	ePZ	06 53 49		eSE	58
29	iPZ	12 37 49 d	7	eXE	07 18 05

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
9	ePZ	07	30	03	16	eXZ	15	36	01
	eSE			24	17	eXN	10	40	35
9	eXE	12	43	32	17	eXN	14	14	08
	eXE		47	14	17	eXZ	14	23	28±
13	eXZ	19	24	31	17	eXN	20	27	09
14	eXE	07	15	53	18	ePZ	02	16	24
16	eXE	18	31	56		e(S)N		22	59
19	eXZ	05	07	58	18	eXN	15	08	42
21	eXE	10	57	24	19	ePZN	05	01	02
26	eXZ	23	21	43	20	eXZ	16	06	43
28	ePZ	21	24	13	20	ePZ	16	09	37
	eXZ			42	21	eXN	00	07	07
29	eXE	02	56	48	23	eXZ	01	54	19
	Chittagong				26	eXZ	20	39	48±
1	eXN	13	22	34	26	eXZ	23	14	32
2	ePZ	00	22	28	27	eXZ	04	31	15
3	ePZ	05	24	01	30	eXZ	01	28	51
4	eXN	11	21	52	30	eXN	12	04	34
4	eXN	13	10	58					
5	eXN	21	43	32					
7	eXZ	04	26	27					
8	ePZ	00	29	46±					
8	eXZ	05	43	09					
9	eXZ	13	03	34					
10	eXN	16	05	10					
11	eXZ	20	35	19					
12	eXZ	10	29	36					
12	eXZ	23	40	06					
13	ePZ	09	29	26±					
15	eXN	16	25	10					
15	eXN	21	16	01					

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Vol. 7

April 1961

No. 4

CONTENTS

1.	Particulars of Stations and Instruments	1
2.	Major shocks ...	...	3
3.	Local and Minor shocks ...	...	24

Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Quetta (Central Station)				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Countd.)

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore				
Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi				
Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong				
Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak				
Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds
 (Pas), (Berk), (Up), (Ki) stand for seismological observatories Pasadena (U.S.A.),
 Berkley (U.S.A.), Uppsala (Sweden) and Kiruna (Sweden) respectively.
 All times are in Greenwich Mean Time.

Seismological Bulletin of Pakistan
 Volume 7 No. 4, April 1961

				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
1	Qt	ePZ	02 50 53				
		USCGS H	02 40 43.8			USCGS H	18 47 21.0
		30.5 N	139.7 E			0.3 S	133.1 E
		South of Honshu, Japan				Near east coast of	
		depth about 135 km				New Guinea	
						depth about 85 km	
1	Qt	ePZ	08 19 24	3	Qt	ePZ	03 54 54
		USCGS H	08 08 19.4			USCGS H	02 43 48.9
		50.6 N	159.9 E			53.6 N	161.1 E
		Off east coast of				Near east coast of	
		Kamchatka				Kamchatka	
		depth about 38 km				depth about 25 km	
1	Wr	ePZ	15 20 19	3	Qt	ePZ	16 43 00
	Qt	ePZ	21 31 c			ePcPZ	27
		iPPZE	39			USCGS H	16 32 04.3
		iSNEN*	23 51			52.5 N	158.9 E
		Mu Sec				Near east coast of	
		PZ 2.0 1.8				Kamchatka	
		Δ = 12° .4				depth about 38 km	
	Kr	ePZ	15 22 24±	4	Wr	iPZ	01 19 51 d
		eSE	25 39			iSN	21 23
		H 15 18 31				Qt	ePZ
		38 1/4 N 78 E				esPZE	33
		Western Sinkiang				eSNE	23 28
		Province, China				eXNN*	45
		USCGS H	15 18 22.8			USCGS H	01 17 59.3
		39.6 N	77.7 E			39.7 N	78.1 E
		Sinkiang Province, China				Sinkiang Province, China	
		depth about 21 km				depth about 81 km	
		Mag 6 (Pal), 7.3 (Qt)					
2	Qt	ePZ	18 58 24	4	Wr	ePZ	01 28 02
						eSN	29 32

Seismological Bulletin of Pakistan
Volume 7 No. 4, April 1961

Major Shocks

Date	Station	Phase	h	m	s
	Qt	ePZ		13	
		eSNE		31	38
		USCGS H 01 26 07.9			
		39.6 N 78.0 E			
		Sinkiang Province, China			
		depth about 64 km			
4	Wr	iPZ	09	48	33
	Lh	ePZ		47	
		iSN		50	22
	Qt	ePZ	49	44	d
		eXZE		49	
		ePPZ		53	
		eSNEN*		52	05
		eSSNE		19	
		eLNN*		52.5	
		Mu Sec			
		PZ 0.6 2.0			
		$\Delta = 12^{\circ} 5$			
	Kr	ePZ	09	50	44
		eSE		53	56
		H 09 46 42			
		39 N 77.8 E			
		Western Sinkiang			
		Province, China			
		USCGS H 09 46 36.6			
		40.1 N 77.8 E			
		Sinkiang Province, China			
		depth about 16 km			
		Mag 6.8 (Qt)			
4	Qt	ePZ	10	48	07

4

Seismological Bulletin of Pakistan
Volume 7 No. 4, April 1961

Major Shocks

Date	Station	Phase	h	m	s
		eSNE	20	48	
	Qt	ePZ		11	d
		eSNEN*		22	33
		H 18 17 10			
		39.5 N 78 E			
		Western Sinkiang			
		Province, China			
		depth about 100 km			
6	Wr	iPZ	01	35	42
	Lh	ePZ		56	c
		eSZE		37	30
	Qt	ePZ	36	51	c
		eSNEN*		39	11
		eLNN*		39.7	
	Kr	ePZ	37	53	
		eSE		41	03
		H 01 33 51			
		39.5 N 77.5 E			
		Western Sinkiang			
		Province, China			
		USCGS H 01 33 46.9			
		39.6 N 77.8 E			
		Sinkiang Province, China			
		depth about 33 km			
6	Wr	ePZ	11	05	59
	Lh	ePZ		06	15
		eSN		07	50
	Qt	ePZ		10	
		eSNE		09	30

5

Seismological Bulletin of Pakistan
Volume 7 No. 4, April 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Near Lar, Southern Iran USCGS H 18 12 40.7 27.8 N 56.7 E Southern Iran depth about 109 km Mag 6.6 (Qt, Kr)						36 N 70½ E Hindukush depth about 170 km USCGS H 04 40 37.0 36.2 N 70.8 E Hindukush depth about 73 km			
6	Wr	iPZ	19	15	57	7	Wr	iPZ	04	53	22
	Lh	ePZ	16	11				iSN		47	
	Qt	ePZ	17	06			Lh	ePZ	54	05	
6	Qt	ePZ	21	28	22			eSN	55	04	
6	Lh	ePZ	22	33	18		Qt	ePZ	54	21 d	
	Wr	ePZ	34	01				esPE		57	
	Qt	ePZ		04 d				eSZE	55	35	
		ePPZNEN*	35	39				H 04 52 45			
		eLN*	43	0				36 N 70½ E Hindukush depth about 200 km USCGS H 04 52 40.0 36.1 N 70.7 E Hindukush region depth about 60 km			
		USCGS H 22 26 29.6 1.9 N 96.5 E Near coast of Sumatra depth about 25 km				7	Qt	ePZ	06	51	51
7	Qt	ePZ	02	23	47	7	Qt	ePZ	10	14	40
7	Wr	iPZ	04	41	17 d			USCGS H 10 06 49.5 0.3 S 97.0 E Near coast of Sumatra depth about 25 km			
	Lh	ePZ	42	01							
		eSNE	59			7	Lh	ePZ	20	05	24
	Qt	iPZ	17 d				Qt	ePZ			56
		esPNE	53								
		eSNE	43	32							
	Kr	ePZ	33 ±								
		eSE	45	33							
		H 04 40 41									

Seismological Bulletin of Pakistan
Volume 7 No. 4, April 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPZ	08	34				Wr	ePKPZ	19	31 c
		eSN*	14	58				Lh	ePKPZ		33
		USCGS H 19 54 51.9 57.2 N 163.3 E Near east coast of Kamchatka depth about 20 km							USCGS H 17 59 46.7 38.2 S 72.7 W Chile depth about 60 km Mag 6½ (Pas), 5½-6 (Pal)		
7	Wr	ePZ	21	19	11	8	Wr	iPZ	19	28	10
	Lh	ePZ		42			Qt	ePZ			46
		iSNE	21	09				USCGS H 19 18 54.8 37.6 N 140.3 E Honshu, Japan depth about 189 km			
	Qt	ePZ	20	16 c							
		esPZN		29							
		iSNEN*	22	14							
		H 21 17 44 39½ N 73 E Kirghiz, S. S. R. depth about 50 km USCGS H 21 17 43.8 39.3 N 73.0 E Kirghiz-Tadzhik border depth about 44 km				8	Ch	ePN*	21	45	27
								epPN*			58
								ePPN*	47	26	
								ePPPN*	48	25	
								eSN*	52	32	
							Lh	ePE	47	23	
								eSE	56	00	
							Qt	ePZ	48	03 d	
								epPZ			30
								ePPZN*	50	43	
								e!SN*	57	20	
								e!sSN*	58	03	
								eSSN*	22	02	05
								Mu	Sec		
								PZ 0.8	1.8		
								Δ = 73°			

Seismological Bulletin of Pakistan
Volume 7 No. 4, April 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Kr	ePZ	21	48	07			ePPPZE	46	45	
		epPZ			29			iSNN*	51	03	
		USCGS H	21	36	41.6			eScSNE	53	48	
		14.8 N	145.1 E					eSSEN*	54	38	
		Mariana Islands region						iLN*	55.8		
		depth about 105 km						Mu	Sec		
		Mag 6½ (Pas), 6.3 (Qt)						PZ	1.2	2.0	
9	Qt	ePKPZ	09	39	14 d			△ = 49° 1			
		USCGS H	09	21	29.0		Kr	ePZ	15	44	04 c
		26.0 S	178.4 E					eSE	51	05	
		South of Fiji Islands						USCGS H	15	35	05.4
		depth about 655 km						24.1 N	122.2 E		
9	Qt	ePZ	13	30	28			Near coast of Formosa			
		USCGS H	13	20	49.0			depth about 13 km			
		29.7 S	138.2 E					Mag 6 (Pas), 6.5 (Qt)			
		South of Honshu, Japan				9	Qt	ePKPZ	17	37	21
		depth about 352 km						ePPZ	40	36	
9	Ch	ePZ	15	41	02 c		Lh	ePKPZ	37	31	
		ePPZN*			50			USCGS H	17	17	47.6
		ePPPZN*	42	03				18.2 S	70.2 W		
		eSZN*	45	45				Chile-Peru border			
	Lh	ePZ	43	05	c			depth about 29 km			
		ePPE	44	53		9	Lh	ePZ	20	07	08
		eSE	49	31			Qt	ePZ			47
	Wr	iPZ	43	21	c			USCGS H	19	56	19.0
	Qt	ePZ			57 c			18.6 N	147.7 E		
		eXZ	44	09				Mariana Islands region			
		ePcPZ	45	22				depth about 65 km			
		ePPZEN*	53			10	Ch	ePZ	07	03	08

Seismological Bulletin of Pakistan
Volume 7 No. 4, April 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	ePZ	06	05				H	02	42	30
		USCGS H	06	57	13.6			Kirghiz, S. S. R.			
		24.1 N	122.3 E			11	Wr	iPZ	10	14	43 c
		Near coast of Formosa						iSZ	16	11	
		depth about 22 km					Qt	ePZ	15	57	
10	Qt	ePZ	17	26	02			esPZN	16	11	
		USCGS H	17	15	47.7			eSNE	18	24	
		36.2 N	141.7 E					H	10	12	48
		Near coast of Honshu,						Sinkiang Province, China			
		Japan				11	Qt	ePZ	17	40	55
		depth about 60 km						eSNE	41	20	
10	Wr	ePZ	19	51	08		Wr	iPZ			31
	Qt	ePZ			28			iSZ			23
		eSN*	20	00	32			H	17	40	21
		USCGS H	19	40	15.9			Eastern Baluchistan			
		0.2 S	132.9 E			11	Qt	ePZ	18	42	50 c
		Near coast of						USCGS H	18	32	45.0
		New Guinea						8.8 S	117.4 E		
		depth about 36 km						Near south coast of			
10	Qt	ePZ	20	53	00			Soembawa Island			
11	Qt	ePZ	00	39	56			depth about 182 km			
		USCGS H	00	29	49.2			ePZ	07	58	22
		36.7 N	141.6 E			12	Ch	USCGS H	07	51	40.8
		Off east coast of Honshu,						0.2 N	123.7 E		
		Japan						Northern Celebes			
		depth about 100 km						depth about 89 km			
11	Wr	ePN	02	44	34			ePZ	09	03	57 c
		eSN	46	06		12	Qt	ePPZE	06	20	
	Qt	ePZ	45	42				ePPPZ	07	56	
		eSNE	48	11							

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSNN*	12	06			Qt	ePZ			52
		USCGS H 08 53 50.1						USCGS H 17 52 02.0			
		8.2 S 119.7 E						23.2 N 142.4 E			
		Near Flores Islands						Mariana Islands region			
		depth about 242 km						depth about 64 km			
12	Qt	ePZ	15	12	34 c	12	Wr	ePKPZ	22	39	32
		USCGS H 15 02 00.1					Qt	ePKPZ			37
		45.9 N 149.4 E						ePPZN*	41	50	
		Kurile Islands						e!PKSZNE	42	54	
		depth about 25 km						epPKSZN	43	22	
12	Qt	ePZ	17	17	07			e!sPKSN*	37		
	Wr	ePZ			52			eSKSNN*	46	43	
	Lh	ePZ			18 08			eSKSPN*	51	49	
12	Ch	ePZ	17	24	55		Lh	eXZ	39	49	
	Lh	ePZ			27 23		Ch	ePKPZ	40	06	
	Wr	ePZ			48			USCGS H 22 20 33.6			
	Qt	ePZ			28 02			13.1 N 88.9 W			
		epPZE			37			El Salvador			
		eSNN*			36 11			depth about 122 km			
		USCGS H 17 17 55.3						Mag 5 $\frac{3}{4}$ -6 (Pas)			
		0.3 N 123.8 E				13	Ch	ePZ	04	26	43
		Northern Celebes						iSZN*			27 17
		depth about 122 km					Wr	iPZ			31 03
							Qt	ePZ			26
12	Lh	ePZ	17	37	56			H 04 25 58			
	Qt	ePZ			38 34			23 N 94 $\frac{3}{4}$ E			
		USCGS H 17 27 46.5						Central Burma			
		48.1 N 154.7 E						USCGS H 04 25 58.1			
		Kurile Islands						22.9 N 94.7 E			
		depth about 42 km						Central Burma			
12	Lh	ePZ	18	02	08			depth about 100 km			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
13	Qt	ePZ	15	35	08			USCGS H 16 34 39.1				
		USCGS H 15 26 11.0						40.1 N 77.8 E				
		27.0 N 128.3 E						Sinkiang Province,				
		Ryukyu Islands						China				
		depth about 197 km						depth about 19 km				
13	Wr	iPZ	16	36	33 c	13	Wr	ePN	17	12	54	
		iSN			38 04		Lh	ePZ			13 06	
	Lh	ePZ			36 46 c			eSE			14 40	
		eSZ			38 19		Qt	ePZ			03	
	Qt	ePZ			37 44 c			esPZNE			20	
		ePPZNE			53			eSNE			16 21	
		eXZNE			38 07			H 17 11 08				
		iSZNEN*			40 07			39 N 77 $\frac{3}{4}$ E				
		eLN*			40.5			Western Sinkiang				
		Mu Sec						Province, China				
		PZ 4.8 2.5						depth about 100 km				
		PN 5.0 2.5										
		PE 3.9 2.5					13	Qt	ePZ	17	21	13
		$\Delta = 12^{\circ} 6$						eSN			23 31	
	Kr	ePZ	16	38	38 c			Sinkiang aftershock				
		iSE			41 54		13	Wr	ePN	18	08	36
	Ch	ePZN*			39 29		Qt	ePZ			09 47	
		ePPZN*			50			esPZ			10 04	
		ePPPZN*			40 00			eSZN			12 05	
		eSZN*			43 22			H 18 06 49				
		eSSZN*			53			Sinkiang Province, China				
		H 16 34 39					13	Wr	ePN	20	15	14
		39 $\frac{1}{2}$ N 77 $\frac{3}{4}$ E					Lh	ePZ			23	
		Western Sinkiang					Qt	ePZ			16 24	
		Province, China						esPZ			39	
								eSNE			44	

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		South of Honshu, Japan depth about 141 km				18	Wr	ePZ	13	55	14
17	Qt	ePKPZ	20	54	19		Qt	ePZ			28
		ePPZE		57	48			USCGS H	13	44	08.7
	Lh	ePKPZ		54	35			6.3 S	131.5	E	
		USCGS H	20	35	15.4			Banda Sea			
		20.8 S		68.5	W			depth about 67 km			
		Chile-Bolivia border				18	Wr	iPZ	16	11	07 d
		depth about 200 km					Lh	ePZ			22
17	Qt	ePKPZ	21	06	07		Qt	ePZ			12 19
		USCGS H	20	48	12.5			eSNE			14 40
		21.3 S		178.6	E			H	16	09	18
		Tonga Islands region						39½ N	77	E	
		depth about 549 km						Western Sinkiang			
17	Lh	ePZ	23	28	51	18	Qt	ePZ	17	04	48
		eSZ		30	28			ePKPZ	19	09	03
	Qt	ePZ		29	46			ePKP ₂ Z			15
		eSN		32	07		Lh	ePKP ₂ Z			29
		H	23	26	44			USCGS H	18	49	25.1
		Western Sinkiang						38.5 S	73.3	W	
		Province, China						Near coast of southern			
18	Qt	ePZ	04	25	54			Chile			
		USCGS H	04	14	13.0			depth about 30 km			
		13.1 N		146.8	E	18	Lh	ePZ	22	12	01
		Mariana Islands						USCGS H	22	04	21.5
		depth about 38 km						1.5 S	99.5	E	
18	Ch	ePZ	08	36	12			Off coast of Sumatra			
		USCGS H	08	26	54.8			depth about 39 km			
		44.6 N		150.1	E	19	Qt	ePZ	03	54	04
		Kurile Islands						USCGS H	03	43	10.1
		depth about 25 km						8.7 S	123.6	E	

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Sawoe Sea						USCGS H	16	12	28.7
		depth about 25 km						44.2 N	148.0	E	
19	Qt	iPnZNE	06	58	14 c			Kurile Islands			
		i!PgZNE		25				depth about 51 km			
		iSnNN*		51		19	Ch	ePZ	18	24	01
		iS*N*		58			Wr	iPZ		24	26
		iSgEN*		59	02		Qt	ePZ		25	01
		Mu	Sec					USCGS H	18	13	51.8
		PZ	0.5	1.3				55.1 N	163.6	E	
		$\Delta = 2^\circ.7$						Kamchatka			
	Lh	ePnZ	06	58	27			depth about 21 km			
		eSnE		59	09	19	Ch	ePZ	20	29	03
	Wr	ePZ		58	31		Wr	ePZ			53
	Kr	ePZ		59	00		Qt	ePZ		30	29 c
		eSE		07	00	07		eSNN*		39	08
		H	06	57	28			USCGS H	20	19	46.4
		30½ N		70	E			44.6 N	150.2	E	
		Suleman Range						Kurile Islands			
		West Pakistan						depth about 27 km			
		Mag 5½ (Qt)				19	Qt	ePZ	22	18	30
19	Qt	ePZ	07	37	24			USCGS H	22	07	51.2
19	Qt	ePZ	16	16	23 d			44.9 N	149.5	E	
19	Lh	ePZ	16	22	18			Kurile Islands			
		eSE		30	09			depth about 34 km			
	Wr	iPZ		22	23 c	19	Qt	ePZ	22	31	10
	Qt	ePZ		23	00 c			eSNE			46
		epPZ		12		20	Qt	ePKPZ	21	58	17
		eXZE		24	56			USCGS H	21	39	07.0
		eSZNEN*		31	30			15.2 S	173.7	W	
		esSN*		55				South of Samoa Islands			
								depth about 25 km			

Seismological Bulletin of Pakistan
Volume 7 No. 4, April 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
21	Ch	Mag 6—6½ (Pas)						ePcPZE			12
	Qt	ePZ	02	58	55			epPZE			19
		USCGS H 02 50 41.7						eSNEN*	49	21	
		6.9 S 129.0 E						eScSN*			38
		Banda Sea						USCGS H 21 26 42.1			
		depth about 118 km						51.7 N 173.9 W			
21	Qt	ePZ	06	46	35			Andreanof Islands,			
21	Qt	ePZ	19	41	31			Aleutian Islands			
		USCGS H 19 30 36.9						depth about 36 km			
		48.1 N 154.6 E						Mag 5½—5¾ (Pal)			
		Kurile Islands				22	Qt	ePZ	00	43	00
		depth about 23 km						eSNEN*			53 20
21	Lh	ePZ	20	20	56	22	Wr	iPZ	16	57	31
	Qt	ePZ	21	33	c		Qt	ePZ			58 29
		epPZ			43			eSZNE			59 49
		esPZ			50			H 16 56 44			
		ePPZN	24	01				Hindukush			
		eSN*	30	22		22	Wr	iPZ	19	06	56
		esSNE			37		Lh	ePZ			07 12
		ePPSNE			59			eSE			08 47
		eScSNEN*	31	31			Qt	ePZ			04
		eSSN*	34	55				esPZNE			31
		eLN*	38.1					eSNE			10 21
		USCGS H 20 10 38.3						H 19 05 07			
		47.7 N 154.6 E						40 N 77 E			
		Kurile Islands						Western Sinkiang			
		depth about 27 km						Province, China			
21	Wr	iPZ	21	38	35 c	23	Ch	ePZ	05	21	17
	Lh	ePZ			40			epPZ			47
	Qt	ePZ	39	06	c						

Seismological Bulletin of Pakistan
Volume 7 No. 4, April 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPZ	22	46				ePSN*			42
		ePPPZ	23	08				esSN*			47
		eSN*	26	47			Lh	ePE	11	43	
	Lh	ePZ	23	08				eSE	19	44	
		eSE	29	58			Wr	iPZ	11	41 ±	
	Wr	iPZ	23	23 d				eSN	19	54	
	Qt	ePZ			56 d		Qt	iPZ	12	22 o	
		epPZ	24	20				epPZ			32
		ePcPZN	25	03				ePPZN*	14	37	
		ePPN*	26	01				ePPP*	16	13	
		eSZNN*	31	39				iSZEN*	21	01	
		ePSNN*			56			ePSNE	22	23	
		ePPSNEN*	32	05				ePPSNE			33
		esSN*			20			eSSN			25 07
		eScSN*	33	31				ePKPPKPZNE	41	09	
		eSSN*	35	12				Mu Sec			
								PZ 1.0 1.6			
								PPZ 1.1 2.5			
								Δ = 65° 3			
								Kr	ePZ	09	12 44
								esSE			22 02
								USCGS H 09 01 41.8			
								44.6 N 150.2 E			
								Kurile Islands			
								depth about 44 km			
								Mag 6½ (Pas), 6½ (Berk)			
								(Pal), 6.6 (Qt)			
						23	Ch	ePZ	12	27	10
							Lh	ePZ			56
							Wr	ePZ			59

Seismological Bulletin of Pakistan
Volume 7 No. 4, April 1961

Major Shocks

Date	Station	Phase	h	m	s
	Qt	ePZ	28	35	c
		USCGS H 12 17 59.7			
		44.8 N 150.6 E			
		Kurile Islands			
		depth about 78 km			
23	Lh	ePZ	15	05	23
	Qt	ePZ	06	02	
23	Ch	ePN*	17	00	04±
		ePPN*	02	04	
	Wr	iPZ	01	05	c
	Qt	ePZ	41		c
		epPZNE	02	01	
		ePcPZNE	12		
		ePPZEN*	04	01	
		eSNE	10	23	
		eXN*	28		
		esSN*	11	00	
		eScSEN*	39		
		eSSN*	14	30	
		eLN*	19.0		
		Mu Sec			
		PZ 0.2 1.7			
		$\Delta = 65^\circ.3$			
	Kr	ePZ	17	02	06±
		USCGS H 16 51 03.6			
		44.5 N 150.1 E			
		Kurile Islands			
		depth about 76 km			
		Mag 5.8 (Qt)			
23	Wr	iPZ	18	02	08 c

Seismological Bulletin of Pakistan
Volume 7 No. 4, April 1961

Major Shocks

Date	Station	Phase	h	m	s
24	Lh	ePZ	12	37	37
	Wr	iPZ	38		c
	Qt	ePZ	38	16	c
		ePPZ	40	37	
		e(S)N*	47	07	
		USCGS H 12 27 39.5			
		44.5 N 150.2 E			
		Kurile Islands			
		depth about 76 km			
25	Qt	ePZ	00	38	53
		USCGS H 00 28 15.4			
		44.6 N 150.0 E			
		Kurile Islands			
		depth about 72 km			
25	Ch	ePZ	01	26	52
		epPZ	27	18	
		ePPZ	28	55	d
		ePPP*	30	08	
		eSN*	34	14	
		ePSN*	42		
		esSN*	59		
	Wr	iPZ	27	41	
	Qt	ePZ	28	18	c
		epPZ	33		
		eXZE	30	34	
		eSNEN*	37	01	
		iXEN*	08		
		esSN*	21		
		ePSN*	33		
		eSSN*	41	00	

Seismological Bulletin of Pakistan
Volume 7 No. 4, April 1961

Major Shocks

Date	Station	Phase	h	m	s
		esPZNE			39
		eSNE	19	34	
		H 02 14 04			
		Sinkiang Province, China			
26	Qt	ePZ	02	30	10
		USCGS H 02 21 10.5			
		5.6 S 105.6 E			
		Southern Sumatra depth about 93 km			
26	Wr	iPZ	05	24	09 d
		iSN			41
	Lh	ePZ			47±
	Qt	iPZ	25	08	d
		isPZE			48
		iSNEN*	26	30	
	Kr	ePZ			11
		eSE	28	21	
		H 05 23 23			
		36½ N 70½ E			
		Hindukush depth about 200 km			
26	Ch	ePZ	07	48	11
		epPZ			19
		ePPN*	50	10	
		ePPPZ	51	14	
		eSN*	55	34	
		ePSN*			45
		esSN*			48

Seismological Bulletin of Pakistan
Volume 7 No. 4, April 1961

Major Shocks

Date	Station	Phase	h	m	s
	Lh	ePE	48	59	
	Wr	ePZ			59
	Qt	ePZ	49	38	
		ePcPZN	50	10	
		eXZ			27
		ePPZNNEN*	51	59	
		ePPPNNEN*	53	39	
		eSEN*	58	12	
		iXN*			28
		ePPSN*			55
		eSSEN*	08	02	33
		eLN*			06.9
		ePKPPKPZ	18	23	
		Mu Sec			
		PZ 0.3 1.6			
		Δ = 64° · 1			
	Kr	ePZ	07	50	00
		USCGS H 07 38 54.1			
		44.6 N 149.9 E			
		Kurile Islands depth about 20 km			
		Mag 6 (Berk), 5½-6 (Pal), 6.2 (Qt)			
26	Qt	ePZ	11	51	55
		USCGS H 11 46 46.8			
		25.2 N 95.4 E			
		India - Burma border region depth about 217 km			
26	Qt	ePZ	12	08	46 c

Date	Station	Phase	h	m	s
		eXZ	09	54	
		e(S)NE	12	00	
		iXN*	13	00	
		Mu Sec			
		PZ 0.4 1.5			
	Lh	ePZ	12	09	33
26	Wr	ePZ	17	03	18
	Qt	ePZ			35
		USCGS H 16 53 29.4			
		0.2 N 124.1 E			
		Northern Celebes depth about 135 km			
26	Lh	ePE	19	42	37
	Wr	iPZ			37 c
	Qt	ePZ	43	14	c
		epPZ			26
		ePPZ	45	40	
		eSNEN*	51	55	
		eLN*	59.8		
		USCGS H 19 32 34.2			
		44.6 N 150.1 E			
		Kurile Islands depth about 51 km			
26	Wr	iPZ	23	51	23
	Qt	ePZ			52 33
		esPZN	53	00	
		eSZNE	54	51	
		H 23 49 35			
		Western Sinkiang Province, China			

Date	Station	Phase	h	m	s
27	Wr	iPZ	00	46	11 c
		iSZ			47 40
	Lh	ePE			46 26
	Qt	ePZ			47 21
		esPZN			51
		eSNEN*	49	42	
		H 00 44 22			
		39½ N 77½ E			
		Western Sinkiang Province, China depth about 100 km			
27	Qt	ePZ	04	15	27
27	Wr	iPZ	10	58	07 d
		iSZ			36
	Qt	ePZ			59 07
		eSNE	11	00	23
		H 10 57 27			
		Hindukush			
28	Qt	ePZ	06	58	31
		eSNE	07	00	09
	Wt	ePZ	06	59	35
		H 06 56 23			
		29½ N 57 E			
		Southern Iran			
82	Qr	ePZ	09	01	50
		eSNE			03 54
	Wr	ePZ			02 02
		H 08 59 10			
		Iran - Turkmen S. S. R. border region			

Seismological Bulletin of Pakistan
Volume 7 No 4, April 1961

Major Shocks

Date	Station	Phase	h	m	s
28	Qt	ePZ	13	23	46
29	Qt	iPgZNE	03	36	59.6
		iSgZNE	37	01	.3
		Epicentre about 14 km northwest of Quetta Felt Quetta			
29	Qt	ePKPZ	09	38	08
		USCGS H 09 19 28.3 40.6 N 127.5 W Off coast of northern California depth about 26 km Mag 5½ (Berk), 5½-5¾ (Pas, Pal)			
29	Wr	iPZ	09	38	43 d
	Qt	ePZ			59 d
		ePPZNN*	41	00	
		eSNEN*	46	53	
		ePPSNE	47	10	
		eSSN*	50	53	
		Mu	Sec		
		PZ	0.8	2.0	
		Δ = 57° 0			
	Lh	ePZ	09	39	09
	Ch	ePZN*	40	41	
		ePPN*	43	24	
		ePPPN*	45	08	
		eSN*	50	05	
		USCGS H 09 29 09.5 71.3 N 7.4 W			

Seismological Bulletin of Pakistan
Volume 7 No. 4, April 1961

Major Shocks

Date	Station	Phase	h	m	s
		Jan Mayen Islands region			
		depth about 14 km			
		Mag 6.4 (Qt)			
29	Wr	ePZ	10	51	29
	Qt	ePZ	52	12	
		USCGS H 10 45 39.1 41.8 N 104.5 E Outer Mangolia depth about 25 km			
29	Qt	ePZ	13	13	26
29	Qt	ePZ	17	57	38
30	Wr	iPZ	07	45	12
	Qt	ePZ			15
		ePPZN	47	58	
		USCGS H 07 33 53.5 52.0 N 31.9 W North Atlantic Ocean depth about 38 km Mag 5½-5¾ (Pal)			
30	Ch	ePZ	11	09	43
	Qt	ePZ			11 15
		USCGS H 11 00 46.8 45.8 N 150.2 E Kurile Islands depth about 100 km			
30	Wr	iPZ	11	25	19
	Qt	ePZ			56
		epPZ	26	14	
		ePPZE	28	14	
		eSNEN*	34	36	
		iXEN*			52

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	Quetta		10	ePgZ	23 27 57.9
1	e(P)Z	08 59 03		eSgN	28 00.2
	e(S)EN	01 33	11	eXZ	04 41 39
1	ePZ	15 03 27	11	ePgZ	11 23 00
	eSEN	51		eSgNE	11
1	ePZ	19 46 27	11	ePZ	13 57 21
	iSN	55		eSN	58 40
2	eXZ	12 55.0	11	ePZ	23 59 20
3	ePZ	07 52 07	12	eXZ	07 51.0
	eSNE	53 26	12	ePZ	08 11 55
4	ePZ	13 51 13		eSN	12 20
	eXZ	29	12	ePZ	08 12 22
5	ePZ	06 24 49		eSZN	40
	eSNE	25 50	12	eXZ	08 16.0
5	ePZ	07 35 31	12	ePZ	14 43 21
5	ePZ	19 52 48		eSN	44
6	ePZ	21 16 06	12	ePZ	18 01 11
7	ePgZ	13 15 44.6	12	eXZ	18 15.0
	iSgZN	48.2	12	eXZ	22 54.0
7	ePZ	18 38 00 d	12	ePZ	23 56 53
	eSNE	24		eSN	57 20
7	eXZ	18 59 58	13	ePgZ	07 39 43
7	ePZ	20 21 39		eSgN	44
8	ePZ	00 47 17	13	iPZ	07 48 04 d
8	eXZ	02 15 04		iSNE	14
8	eXZ	03 06 15	13	ePZ	07 51 56
8	ePZ	06 02 55		eSNE	52 32
9	e(P)Z	06 32 15	13	ePgZ	09 26 21.6
10	ePZ	23 05 18		eSgN	23.2
	eSN	36	13	ePZ	09 56 41

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
13	ePgZ	12 34 50.2	20	ePZ	05 56 16
	eSgZN	51.8		eSN	58 33
13	ePgZ	22 59 43.2	20	eXN	06 18 56
	eSgZN	44.9	20	eXZ	16 23 02
14	ePZ	01 14 44	20	ePgN	18 38 41
	eSgN	57		eSgZNE	51
14	eXZ	01 29.0	21	ePgZN	06 39 00.0
14	eXN	02 46.0		eSgN	14.6
14	ePZ	23 50 31	21	eXZ	14 56 52
	eSNE	49	21	ePgZ	16 11 43.6
15	ePZ	12 02 31 ±		eSgZN	53.6
15	eXZN	11 16.0	21	ePgZ	16 42 44.9
15	eXN	11 40.0		eSgZN	55.1
16	ePZ	04 13 47	22	ePE	00 41 55
	eSZN	14 46	22	ePgZ	04 32 27
16	ePZ	14 38 31		eSgZN	35
	eSE	39 38	22	ePgZ	13 50 04.1
16	ePgE	22 48 19		eSgNE	03.3
	eSgE	30	22	ePZ	13 57 43
17	eXZ	10 12.0		eSNE	58 08
17	eXZ	20 42.0	22	ePZ	18 36 32
17	eXZ	21 25.0		eSNE	57
18	ePZ	05 15 07	22	ePZ	18 38 24
18	eXZ	05 37.0		eSNE	49
18	ePZ	08 00 20	22	ePZ	18 42 14 d
18	eXZ	16 49.0		eSEN	40
19	eXZ	07 04.0	22	ePgZ	23 33 34.3
19	ePZ	07 53 52		eSgNE	36.3
	eSNE	33	23	ePZ	03 47 26
19	ePZ	11 40 19	23	ePZ	05 16 05
19	ePZ	13 45 46		eSN	31

Seismological Bulletin of Pakistan
Volume 7 No. 4, April 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
24	ePgZ	06 35 23.0	27	eSN	05 18 24
	eSgZN	34.8	27	ePZ	05 18 24
24	ePgZ	11 28 10.4		eSNE	45
	eSgNE	18.3	27	eXZ	06 41.0
24	eXZ	18 28 53	27	eXZ	07 42.0
25	eXZ	00 25 44	27	eXZ	08 26.0
25	ePgZ	00 40 18.5	27	ePgZ	09 34 06
	eSgN	32.7		eSgZN	07
25	ePZ	01 03 30	27	ePZ	12 19 05
	eSNE	55	27	eXZ	17 03.0
25	ePZ	02 42 13	27	e(P)Z	19 11 37
25	ePZ	03 45 13	27	ePZ	23 09 14
	eSNE	46 10		eSN	10 32
25	ePZ	09 18 48	28	ePZ	06 11 00
	eSN	19 14		eSNE	12 17
25	ePZ	14 34 16	28	ePZ	07 21 00
	eSNE	36		eSN	33
25	ePgZ	14 52 40	28	ePgZ	08 54 48
	eSgZNE	54		eSgNE	55 01
25	iPgZNE	14 46 09.0	28	ePZ	14 36 31
	iSgZNE	10.6	28	ePZ	17 23 17
25	ePZ	17 55 11		eSN	25 27
	eSN	56 37	28	ePZ	19 24 27
25	ePgZ	18 07 08.5	28	ePgZ	19 47 35
	eSgZN	11.2		eSgN	39
26	eXZ	01 55 48	28	ePgZ	21 52 51
26	ePZ	12 21 38		eSgN	53 07
26	eXZ	22 27.0	28	ePgZ	22 39 30
27	ePZ	00 12 39		eSgN	46
	eSE	56	29	ePgZ	07 28 12
27	ePZ	03 12 29		eSgNE	20

Seismological Bulletin of Pakistan
Volume 7 No. 4, April 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
29	ePZ	15 15 44		iSZ	50 37
29	ePZ	16 03 19	4	ePZ	17 03 41
29	ePZ	19 53 15		eSZ	04 07
	eSE	54 39	4	iPZ	22 26 49 c
30	ePgZ	13 06 54		iSZ	27 23
	eSgNE	07 08	5	ePZ	04 32 23
	Warsak		5	iPZ	07 34 53 d
1	iPgZ	00 32 01 d	5	iPZ	08 34 31 d
	iSgZ	02	5	ePZ	14 58 50 c
1	ePZ	08 58 35	5	iPZ	18 03 20
	iSZ	59 12	5	iPZ	18 19 00 d
2	ePZ	05 30 28	5	ePZ	19 09 40 c
2	ePZ	07 18 04	5	ePZ	23 47 58
2	ePZ	11 40 29	6	iSZ	48 28
2	iPZ	13 08 42 d	6	ePZ	16 10 27
2	ePZ	17 41 11	6	ePZ	18 29 42
2	iPZ	19 22 32 c		iSZ	30 09
	iSZ	49	6	ePZ	23 14 12
2	iPZ	19 58 08 d	7	iPZ	04 41 17 d
2	ePZ	22 25 28		iSN	42
3	iPZ	07 51 15 c	7	iPZ	19 47 40 d
	iSZ	48		iSZ	48 21
3	ePZ	15 31 00	8	ePN	01 01 04
3	iPZ	17 55 23 c	8	ePN	02 13 53
4	ePZ	04 05 33	8	ePZ	05 00 23
4	iPZ	05 37 11 d	8	iPZ	07 35 44 d
	iSZ	38 38	8	iPZ	09 08 34 c
4	ePZ	08 01 58		iSZ	09 01
4	ePZ	09 39 32	8	ePZ	11 36 28
4	iPZ	14 49 59 d		eSZ	37 01

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
8	iPZ	11 57 46 c	14	ePZ	20 00 33
8	iPZ	14 21 26 d	14	iPZ	22 55 31 c
8	iPZ	15 28 36 c	15	ePZ	05 11 28
8	iPZ	17 11 56 d		iSZ	48
8	iXZ	21 47 06 c	16	ePZ	07 29 43
9	iPZ	06 00 54 d	16	iPZ	08 20 46
9	iPZ	06 30 36 c	16	ePZ	17 50 27
9	iPZ	09 23 24 d	17	iPZ	00 38 14 d
9	iPZ	09 34 10 c	17	ePN	04 49 52
9	iPZ	13 12 00 d		eSN	50 18
9	iPZ	15 43 21 c	18	ePZ	07 27 49
9	ePZ	16 59 08		iSZ	28 27
9	iPZ	17 47 38 c	18	iPZ	09 20 35 c
9	ePZ	19 01 04	19	iPZ	05 23 20 c
9	ePZ	20 07 16	19	ePZ	17 13 28
10	ePZ	14 40 37	19	ePZ	19 53 44
	iSZ	41 06		iSZ	54 21
11	ePZ	10 02 44	19	iPZ	22 25 33 d
11	iPZ	13 56 03 d		iSZ	26 03
	iSN	44	20	iPZ	05 54 15 c
12	ePZ	11 10 49	20	iPZ	07 15 32 c
	iSZ	11 36	20	ePZ	11 12 25
12	iPZ	22 51 50 c	20	iPZ	13 09 50 c
	iSZ	52 31	20	iPZ	16 19 28 d
13	iPZ	05 47 33 c	21	ePZ	08 48 01
13	ePZ	07 52 11	21	ePZ	10 51 37
13	ePZ	09 55 27		eSZ	57
13	ePN	17 55 19	22	ePZ	16 03 51
13	ePN	19 54 17	22	iPZ	16 42 49 d
14	iPZ	18 34 31 c	23	iPZ	00 46 48 c

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	iSZ	42 29		iSZ	58
23	iPZ	02 15 33 d	29	iPZ	19 52 29 c
23	ePZ	20 49 25	30	ePZ	14 44 48
23	ePZ	22 13 17		iSZ	45 37
24	ePZ	04 39 11	30	iPZ	15 40 02 d
24	ePZ	11 28 01		iSZ	27
24	ePZ	15 19 52			
	eSZ	20 10		Lahore	
24	ePZ	15 58 07	1	eXE	15 19 49 ±
24	ePZ	21 02 04	2	ePZ	17 42 04
25	ePZ	00 38 52	4	ePZ	05 38 51
25	iPZ	03 44 25 c		eXZ	39 54
25	iPZ	09 07 01 d	4	eXZ	13 51 48
25	iPZ	10 56 24 d	4	iXZ	21 02 45
25	iPZ	12 19 41 d	5	ePZ	04 31 51
25	ePZ	14 53 45	5	ePZ	04 31 51
25	iPZ	17 54 07 d		iSZE	32 22
	iSZ	39	5	ePZ	09 49 47
25	ePZ	18 58 22		iSEN	50 43
26	ePZ	13 12 03	11	eXZ	02 45 24
27	ePZ	10 07 18	11	eXZ	10 16 17
27	iPZ	12 51 14 d	11	eXZ	13 56 58
27	iPZ	16 46 06 c	13	eXZ	18 08 43
27	ePZ	23 08 15	17	eXZ	05 03 38
	eSZ	42		eSE	52
28	iPZ	06 39 24 d	18	iPZ	09 20 30
	iSZ	40 06		iSE	52
28	ePZ	08 55 54	18	eXZ	13 51 06
29	iPZ	16 30 25 d	27	eXE	18 11 40
	iSZ	31 26		Karachi	
29	iPZ	19 40 19 d	7	eXE	04 59 40

Mnior Shocks

Date	Phase	h m s	Date	Phase	h m s
22	ePZ	01 28 44	21	eXZ	20 19 44
	eXZ	57	21	eXZ	21 38 44±
22	eXZ	18 44 35	22	eXN	00 45 02
22	eXE	19 11 59	22	eXZ	19 10 18
24	eXZ	21 39 22	26	eXN	11 43 00
25	eXZ	14 53 38	27	eXN	00 50 22
	eSE	54 37	28	eXN	07 00 00
26	ePZ	07 50 00±	28	eXN	19 22 08
26	eXZ	12 08 01	29	eXN	10 54 00
26	eXZ	12 25 02			
	eSE	08			
27	eXZ	09 25 53			
	eSE	26 46			
Chittagong					
8	ePN	18 19 23			
10	eXN	19 55 24			
11	eXZ	10 14 54			
12	eXN	09 05 58			
12	ePZ	17 36 48			
13	ePZ	05 46 40			
13	eXN	10 05 02			
13	eXZ	15 32 53			
13	eXZ	17 15 07			
14	eXZ	23 14 56			
15	eXN	12 02 08			
16	eXN	12 24 47			
17	eXN	18 17 52			
18	eXZ	04 23 00			
20	eXN	22 02 00			
21	ePZ	19 39 59			

Bull. Pakistan, Quetta. Vol. 7. No. 5, May, 1961

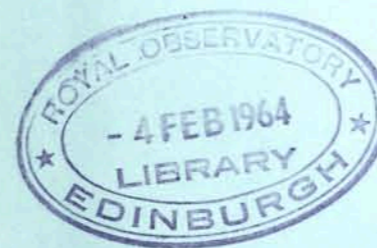
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Pakistan Meteorological Service

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Meteorological Service

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.....

Abdul Qadir Khan

— : —

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Vol. 7 May 1961 No. 5

CONTENTS

1.	Particulars of Stations and Instruments ...	1
2.	Major shocks ...	3
3.	Local and Minor shocks ...	24

Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Quetta (Central Station)				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Countd.)

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore				
Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi				
Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong				
Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak				
Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki) stand for seismological observatories Pasadena (U.S.A.),
 Berkley (U.S.A.), Uppsala (Sweden) and Kiruna (Sweden) respectively.
 All times are in Greenwich Mean Time.

Seismological Bulletin of Pakistan
 Volume 7 No. 5, May 1961

Seismological Bulletin of Pakistan					Major Shocks						
Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
1	Qt	ePZ	00	52	21						
		USCGS H	00	42	16.0						
		36.2 N	141.1	E							
		Near coast of Honshu, Japan									
		depth about 36 km									
1	Qt	ePZ	01	39	45						
	Wr	ePZ	40	48							
1	Qt	ePKPZ	19	03	46						
		USCGS H	18	45	28.9						
		40.7 N	127.3	W							
		Off coast of northern California									
		depth about 69 km									
2	Qt	ePZ	03	21	34						
		USCGS H	03	11	45.7						
		71.2 N	6.9	W							
		Jan Mayen Island region									
		depth about 22 km									
2	Qt	ePKPZ	19	09	52						
		USCGS H	18	50	57.5						
		15.2 S	173.1	W							
		Samoa Islands region									
		depth about 71 km									
2	Qt	ePKPZ	19	57	13						
		USCGS H	19	38	13.5						
		27.8 S	176.4	W							
		Kermadec Islands region									
		depth about 53 km									
2	Qt	ePKPZ	19	58	35						

Seismological Bulletin of Pakistan
Volume 7 No. 5, May 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
3	Qt	USCGS H 13 10 04.0 18.4 N 122.2 E Near coast of Luzon, Philippine Islands depth about 25 km	17	13	13	5	Qt	depth about 25 km ePKPZ 06 58 04 USCGS H 06 39 07.9 27.7 S 176.4 W Kermadec Islands region depth about 84 km	09	03	16
3	Qt	USCGS H 16 54 11.4 27.8 S 176.1 W Kermadec Islands region depth about 49 km	19	19	42	5	Qt	USCGS H 08 44 15.7 27.3 S 176.4 W Kermadec Islands region depth about 42 km	14	01	10
3	Lh	USCGS H 19 00 40.7 27.7 S 176.0 W Kermadec Islands region depth about 44 km	20	14	28	5	Ch	ePPN* 02 19	02	19	
3	Qt	ePZ 28 d				5	Qt	ePKPZ 09 21	09	21	
4	Qt	ePZ 33 06				5	Qt	eSKSN* 21 46	21	46	
4	Qt	USCGS H 15 23 17.3 0.6 S 98.8 E Near coast of Sumatra depth about 41 km	15	31	18	5	Qt	eSSN* 21 46	21	46	
4	Qt	USCGS H 17 46 25.4 5.0 N 127.6 E Off coast of Mindanao, Philippine Islands	17	56	50	5	Qt	USCGS H 13 43 21.1 27.8 S 176.1 W Kermadec Islands region depth about 84 km Mag 6½ (Pas)	15	47	51
						5	Wr	USCGS H 15 28 50.7 27.3 S 176.1 W Kermadec Islands region depth about 60 km	19	33	08

4

Seismological Bulletin of Pakistan
Volume 7 No. 5, May 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Lh	eSN 34 48				6	Lh	USCGS H 21 16 34.3 6.3 N 126.4 E Near coast of Mindanao, Philippine Islands depth about 93 km	22	42	09
	Qt	ePZ 33 19				6	Wr	ePN 25			
		eSZ 35 06				6	Qt	ePZ 53			
		ePPZE 31						epPNE 43 17			
		eSNE 36 55						esPE 27			
		H 19 30 58				6	Qt	ePPE 45 10			
		40½ N 79½ E						eSEN* 50 56			
		Western Sinkiang Province, China depth about 100 km						eLN* 57.8			
		USCGS H 16 04 33.1 37.4 N 11.2 E Mediterranean Sea, Off coast of Tunisia depth about 30 km	16	13	03	6	Qt	USCGS H 22 32 49.7 6.3 N 126.3 E Near coast of Mindanao, Philippine Islands depth about 110 km	00	38	04
			19	50	39			eSE 48 20			
			20	01	00	7	Lh	ePN 38 21			
			13.3				Wr	ePZ 36			
	Wr	ePN 19 51 01					Qt	epPN 39 02			
	Lh	ePZ 05						ePPN 42 20			
		USCGS H 19 38 04.6 1.2 S 15.5 W Atlantic Ocean, north of Ascension Island depth about 24 km	19	51	01			eSKSN* 49 05			
			21	25	55			eSNE 27			
	Lh	ePZ 26 40				6	Lh	ePSN* 50 49			
	Qt	ePZ 26 40					Qt	eLN* 01 03.8			

5

Seismological Bulletin of Pakistan
Volume 7 No. 5, May 1961

Major Shocks

Seismological Bulletin of Pakistan
Volume 7 No. 5, May 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 00 25 40.8 6.1 S 154.4 E Solomon Islands region depth about 123 km Mag $6\frac{1}{2}$ - $6\frac{3}{4}$ (Pas)						Near coast of Java depth about 113 km			
7	Lh	ePZ	01	09	01	7	Ch	epPN*	10	30	15
	Wr	ePN			13±			ePPN*		31	29
	Qt	ePZ			44			ePcPN*		32	10
		esPZ			57			eSN*		35	36
								esSN*		36	09
		USCGS H 00 59 06.3 44.3 N 149.4 E Kurile Islands depth about 37 km					Wr	ePN		32	29
							Kr	ePZ			48
7	Ch	ePZ	04	39	11			esSE		41	34
		esPZ			50		Qt	ePZE		32	53
		e(PP)Z			40 47			epPE		33	11
		iXZ			41 36			esPZNE			24
		eSN*			44 44			iSNEN*		41	05
	Kr	iPZ			41 38 c			isSEN*			47
	Wr	ePN			51			eScSN*		42	35
	Qt	ePZNE			55			eSSN*		45	09
		esPNE			42 25			eLN*		48.2	
		ePPE			44 06			ePKPPKPNE	11	02	02
		eSNEN*			49 42			USCGS H 10 22 43.7 5.8 N 126.8 E Off coast of Mindanao, Philippine Islands depth about 89 km			
		ePSN*			50 10		7	Qt	ePZ	12	23 56
		esSN*			21			USCGS H 12 14 15.5 35.2 N 134.5 E Honshu, Japan depth about 25 km			
		esSN*			53 36						
		USCGS H 04 32 14.5 8.6 S 111.4 E									

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
7	Qt	ePZ	15	50	36			depth about 41 km			
		e(S)N*			58 38						
	Lh	ePZ			50 45						
		USCGS H 15 40 52.5 71.2 N 7.1 W Jan Mayen Islands region depth about 66 km									
7	Wr	ePZ	18	03	13						
		iSN			39						
	Lh	ePZ			56						
		eSZ			04 54						
	Qt	ePZE			13						
		esPE			50						
		iSNE			05 25						
		H 18 02 40 35.2 N 70.2 E Hindukush depth about 160 km									
7	Qt	ePZ	22	53	39						
		USCGS H 22 40 44.2 7.0 S 154.8 E Solomon Islands region depth about 171 km									
8	Qt	ePZ	08	22	53						
8	Qt	ePZ	08	36	19						
		USCGS H 08 24 45.7 3.4 S 135.6 E Near coast of New Guinea									

Date	Station	Phase	h	m	s
		depth about 110 km			
9	Qt	ePZ	17	36	50
11	Wr	ePN	01	01	13
		eSN	08	59	
	Qt	ePZ	01	18	
		eSNE	09	08	
		USCGS H 00 51 24.2			
		8.4 S 112.5 E			
		Near coast of Java			
		depth about 39 km			
11	Qt	ePZ	07	24	12
		USCGS H 07 11 47.9			
		6.4 S 146.5 E			
		Near coast of			
		New Guinea			
		depth about 122 km			
11	Qt	ePKPZ	08	58	07 c
		ePKP ₂ ZN		18	
		epPKPZN		26	
		ePPZN	09	01	47
	Wr	ePKP ₂ N	08	58	21
	Lh	ePKPZ		16	
	Ch	ePKPN*		25	
		USCGS H 08 38 27.1			
		37.2 S 73.6 W			
		Near coast of			
		southern Chile			
		depth about 47 km			
11	Wr	ePN	13	03	05
		eSN		43	

Date	Station	Phase	h	m	s
		depth about 110 km			
12	Wr	ePN	20	10	46
		eSN		11	55
	Lh	ePZ		12	
	Qt	ePZ		52	
		eSZNE	13	57	
		H 20 09 11			
		Tadzhikistan -			
		Sinkiang border			
13	Qt	ePKPZ	14	00	53
		USCGS H 13 41 48			
		27.8 S 176.2 W			
		Kermadec Islands			
		region			
		depth about 32 km			
13	Qt	ePKPZ	14	37	47
		ePKSN*		41	17
		eSKSN*		44	53
		USCGS H 14 18 42.4			
		27.9 S 176.0 W			
		Kermadec Islands			
		region			
		depth about 25 km			
13	Qt	ePKPZ	15	10	47
		USCGS H 14 52 55.3			
		17.5 S 178.8 W			
		Fiji Islands region			
		depth about 556 km			
13	Lh	ePZ	15	59	23
		epPZ		34	
		esSE	16	07	35

Date	Station	Phase	h	m	s
14	Qt	ePZ	15	18	17
USCGS H 02 43 22.7 27.9 S 176.3 W Kermadec Islands region depth about 47 km					
14	Qt	ePZ	15	48	22
USCGS H 15 08 04.2 67.7 N 18.4 W North of Iceland depth about 47 km					
15	Wr	iPZ	05	00	22 d
USCGS H 15 38 07.5 67.7 N 18.4 W North of Iceland depth about 23 km					
15	Lh	eSE	02	06	
15	Qt	ePZ	01	28	
eSZNE 02 56 H 04 59 35 37 N 71½ E Afghanistan - Tadzhikistan border depth about 150 km					
15	Qt	ePKPZ	21	11	46
USCGS H 23 53 05.3 20.0 S 177.2 W Tonga Islands region depth about 89 km					

Date	Station	Phase	h	m	s
15	Wr	iPZ	22	24	15
iSZ 54					
15	Lh	ePZ	25	59	
eSZ 21					
15	Qt	ePZ	26	49	
eSNE 26 49 H 22 23 28 37 N 71½ E Afghanistan - Tadzhikistan border depth about 150 km					
16	Lh	ePZ	03	44	15
16	Qt	ePZ	47	53	
ePPZNE 47 53 USCGS H 03 32 11.7 51.8 N 171.3 W Fox Islands, Aleutian Islands depth about 38 km					
16	Qt	ePZ	04	05	08
USCGS H 02 53 43.7 52.0 N 171.5 W Fox Islands, Aleutian Islands depth about 62 km					
16	Wr	iPZ	17	06	16
iSZ 07 20					
16	Qt	ePZ	09	03	
eSZNE 09 03					

Date	Station	Phase	h	m	s
16	Qt	ePKPZ	17	46	33
USCGS H 17 27 34.1 27.9 S 176.4 W Kermadec Islands region depth about 53 km					
16	Ch	ePN*	21	52	30
epPN* 38 ePPN* 54 05 eSN* 58 11 eSSN* 22 00 39					
16	Wr	ePZ	21	54	27
16	Qt	ePZ	55	01	
epPZE 10 esPNE 18 ePcPZ 58 ePPZNE 57 07 ePPPZ 58 23 eSNEN* 22 02 39 esSNN* 03 04 eSSN* 06 28 eLN* 08.9					
Mu Sec PZ 0.5 1.8 Δ = 55° 0					
16	Kr	ePZ	21	55	13
USCGS H 21 45 24.0 30.0 N 132.0 E Ryukyu Islands					

Date	Station	Phase	h	m	s
depth about 25 km Mag 5¼-5½ (Pal), 6.2 (Qt)					
17	Qt	ePZ	14	29	22
17	Wr	iPZ	17	45	19 d
iSZ 46 51 Lh ePZ 45 34 eSZ 47 17 Qt ePZ 46 30 eSNE 48 55 H 17 43 21 40 N 78½ E Western Sinkiang Province, China depth about 100 km					
17	Ch	ePN*	19	40	21
ePPN* 42 45 ePPPZ* 44 22 iSN* 49 20 eScSN* 50 11 Wr ePZ 40 36 Lh ePZ 40 c Qt ePZ 41 10 c epPNE 19 ePcPZNE 33 ePPZNE 44 00 ePPPZE 45 55 eSNEN* 50 51 esSNE 51 12 ePSN* 36					

Seismological Bulletin of Pakistan
Volume 7 No. 5, May 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPSN*			55			Western Sinkiang			
		eSSN*			55 57			Province, China			
		eLN*	20	01	5	18	Ch	eSN*	20	50	39
		Mu Sec					Wr	ePZ	47	44	d
	PZ	0.6	1.4					epPZ	48	24	
		$\Delta = 76^\circ 4$					Qt	ePZ		02	d
18	Kr	ePZ	19	41	34			epPZ		41	
		USCGS H	19	29	19.3			esPZ		59	
		52.0 N	173.9	E				eSN*	56	03	
		Near Islands,						esSNEN*	57	13	
		Aleutian Islands						USCGS H	20	37	57.0
		depth about 21 km						4.6 N	125.7	E	
		Mag 6 (Pas), 6 $\frac{1}{4}$ -6 $\frac{1}{2}$ (Pal),						Near south coast of			
		6.4 (Qt)						Mindanao,			
18	Lh	ePZ	00	28	38			Philippine Islands			
	Wr	ePZ			53			depth about 126 km			
	Qt	ePZ	29	35		18	Qt	ePKPZ	22	27	53
		USCGS H	00	23	45.2			USCGS H	22	08	00.4
		33.3 N	99.3	E				3.3 S	103.3	W	
		Sinkiang Province,						Southwest of			
		China						Galapagos Islands			
		depth about 27 km						depth about 36 km			
18	Wr	iPZ	06	37	11	18	Qt	ePKPZ	23	29	57 e
	Lh	ePZ			28			ePKP ₂ Z	30	07	
	Qt	ePZ	38	22				USCGS H	23	10	13.7
		eSNE	40	46				38.2 S	73.4	W	
		40 N	77	E				Near coast of Chile			
		H	06	35	17			depth about 25 km			
						19	Qt	ePZ	01	00	34

Seismological Bulletin of Pakistan
Volume 7 No. 5, May 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H	00	50	20.8			iPZ	21	31	29
		3.8 N	125.7	E				iSN		32	13
		Off south coast of					Lh	ePZ			00
		Mindanao,						eSZE		33	02
		Philippine Islands					Qt	ePZ		32	36 c
		depth about 77 km						eSZNEN*		34	14
19	Qt	ePKPZ	02	39	22		Kr	ePZ		33	36
		USCGS H	02	21	31.8			H	21	30	30
		22.5 S	179.2	E				37 $\frac{1}{2}$ N	73	E	
		Fiji Islands region						Tadzhikistan, S. S. R.			
		depth about 600 km						depth about 230 km			
19	Qt	ePKPZ	09	44	47			USCGS H	21	30	16.8
		epPKPZ			45 01			38.3 N	72.6	E	
		USCGS H	09	25	26.6			Tadzhik, S. S. R.			
		11.3 N	88.3	W				depth about 37 km			
		Off coast of Nicaragua				20	Wr	ePN	02	22	17
		depth about 34 km						ePZ		23	27
19	Lh	ePZ	16	45	32	20	Lh	ePZ	12	00	54
		eSE			52 00		Qt	ePZ			01 34
	Wr	ePZ			45 51			USCGS H	11	51	01.2
	Qt	ePZ			46 22 d			44.0 N	148.8	E	
		epPZE			36			Kurile Islands			
		esPE			49			depth about 59 km			
		eSNEN*			53 35	20	Qt	ePZ	18	00	57
		eSSN*			57 13			eSN*			08 08
		eLN*			58.2			eLN*			13.2
		USCGS H	16	37	28.9			USCGS H	17	52	04.6
		24.1 N	123.4	E				6.5 S	31.7	E	
		Ryukyu Islands						Tanganyika			
		depth about 71 km						depth about 58 km			
						21	Qt	ePZ	10	22	41

Seismological Bulletin of Pakistan
Volume 7 No. 5, May 1961

Major Shocks

Date	Station	Phase	h	m	s
	USCGS H		10	13	47.7
			23.7 N	123.5 E	
			Ryukyu Islands		
			depth about 63 km		
21	Qt	ePZ	19	46	25
		eSZNEN*	48	25	
21	Lh	ePZ	21	19	58
	Qt	ePZ	20	28	
	USCGS H		21	10	01.6
			2.0 N	127.0 E	
			Molucca Passage		
			depth about 103 km		
22	Qt	ePKPZ	14	03	31 c
		ePPZNE	05	10	
		ePKSZNE	06	47	
	USCGS H		13	44	35.8
			21.3 S	174.4 W	
			Tonga Islands		
			depth about 27 km		
22	Lh	ePKPZ	17	51	07
	Qt	ePKPZ	19		
		ePPZNE	53	09	
		eSKSN*	58	26	
		eSSN*	18	09	53
	USCGS H		17	32	21.6
			22.8 S	176.1 W	
			Tonga Islands region		
			depth about 35 km		
			Mag 6½-6¾ (Pas)		

Seismological Bulletin of Pakistan
Volume 7 No. 5, May 1961

Major Shocks

Date	Station	Phase	h	m	s
	USCGS H		03	40	26.1
			9.8 N	84.0 W	
			Costa Rica		
			depth about 136 km		
23	Lh	ePZ	05	27	02
	Qt	ePZ	54		
23	Qt	ePKPZ	17	03	53
		ePKSZNEN*	07	15	
	Lh	ePKPZ	04	02	
	USCGS H		16	44	59.4
			12.6 N	87.3 W	
			Near coast of		
			Nicaragua		
			depth about 138 km		
24	Qt	ePZ	17	28	58
		eSN*	37	34	
		eLN*	45	5	
	USCGS H		17	18	17.6
			8.2 S	121.8 E	
			Flores Sea		
			depth about 36 km		
24	Wr	ePN	21	57	02
		eSN	34		
	Lh	ePZ	38		
		eSE	58	39	
	Qt	ePZ	01	d	
		eSNE	59	19	
	H		21	56	21
			36 N	71½ E	
			Hindukush		

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 22 49 49.4						depth about 156 km			
		38.4 N 142.9 E				27	Wr	ePN	10	17	37
		Near east coast of						eSN		18	06
		Honshu, Japan					Qt	ePZE			41
		depth about 60 km						eSNE		19	59
27	Wr	ePN	05	15	39		H	10 16 59			
		eSN		16	08			Hindukush			
	Lh	ePZ		17		27	Wr	ePN	10	38	13
		eSZ		17	13			eSN			41
	Qt	iPZNE	16	35	d		Lh	ePZ	39	00	
		esPZNE	17	18			Qt	ePZ			06
		iSZNEN*		52				eSNEN*	40	10	
		Mu Sec					H	10 37 42			
		PZ 0.8 1.2						35 N 69.4 E			
		$\Delta = 6^{\circ} 8$						Eastern Afghanistan			
		H 05 14 57						USCGS H 10 37 39.6			
		36 N 70.4 E						35.2 N 70.0 E			
		Hindukush						Hindukush			
		depth about 230 km						depth about 32 km			
		USCGS H 05 14 43.7				27	Qt	ePZ	17	00	08
		36.8 N 70.9 E						epPZNE			16
		Hindukush						ePPZE		01	44
		depth about 92 km						eSN*		06	16
		Mag 5.6 (Qt)						eLN*		10	6
27	Qt	ePZ	07	28	10 c			USCGS H 16 52 19.3			
		epPNE			48			0.8 N 98.5 E			
		USCGS H 07 18 12.2						Near coast of			
		41.0 N 142.1 E						northern Sumatra			
		Near north coast of						depth about 39 km			
		Honshu, Japan				27	Qt	ePZ	17	34	19

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 17 26 32.2						depth about 25 km			
		1.2 N 98.4 E				29	Qt	ePZ	00	35	27
		Near northwest coast						esPZNE			56
		of Sumatra						eSN*		45	59
		depth about 36 km						USCGS H 00 22 55.6			
27	Qt	ePZ	22	47	26			52.1 N 166.6 W			
		USCGS H 22 38 35.5						Fox Islands,			
		15.8 N 119.2 E						Aleutian Islands			
		Near coast of Luzon,						depth about 67 km			
		Philippine Islands				29	Qt	ePZ	04	05	47
		depth about 92 km				29	Qt	ePZ	05	06	09
28	Qt	ePZ	01	23	57			e!XN*			11 38
28	Qt	ePZ	02	42	41 c	29	Qt	ePKPZ	07	47	55
		USCGS H 02 30 20.8						ePKP ₂ Z			48 06
		4.9 S 145.0 E					Wr	ePKP ₂ N			19
		Near north coast of						USCGS H 07 28 11.7			
		New Guinea						39.0 S 73.4 W			
		depth about 59 km						Near coast of southern			
28	Qt	ePZ	04	08	38			Chile			
		ePPZ			10 30			depth about 13 km			
		eSN*			15 41	29	Qt	ePZ	10	40	07
		USCGS H 03 59 53.5						USCGS H 10 29 27.8			
		5.4 S 102.4 E						27.7 N 141.7 E			
		Off coast of southern						Bonin Islands			
		Sumatra						depth about 25 km			
		depth about 74 km				29	Qt	ePZ	10	58	32
28	Qt	ePZ	13	39	56			USCGS H 10 52 01.2			
		USCGS H 13 29 25.7						10.6 N 39.4 E			
		8.2 S 119.2 E						Ethiopia			
		Flores Islands region						depth about 25 km			

Date	Station	Phase	h	m	s
29	Qt	ePZ	17	00	47
		USCGS H 16 51 34.8			
		16.2 N 122.4 E			
		Near coast of Luzon, Philippine Islands			
		depth about 25 km			
29	Qt	ePZ	17	58	53
		USCGS H 17 48 21.6			
		2.5 N 128.4 E			
		Halmahera region			
		depth about 25 km			
29	Qt	ePZ	19	30	33
29	Qt	ePZ	19	46	56
29	Qt	ePZ	20	59	28
30	Qt	ePZ	13	17	46
		eSEN*		23	07
		eSSN*		25	17
31	Qt	ePZ	14	50	10
		esPZ			39
		USCGS H 14 39 20.4			
		48.9 N 154.5 E			
		Kurile Islands			
		depth about 50 km			
31	Qt	ePZ	16	50	29
31	Lh	ePZ	19	28	05
	Qt	ePZ			44
		eSN*		39	40
		ePSN*		40	40
		USCGS H 19 15 57.0			
		5.3 S 151.6 E			

Date	Station	Phase	h	m	s
		New Britain			
		depth about 56 km			
		Mag $5\frac{1}{2}$ - $5\frac{3}{4}$ (Pas)			
31	Qt	ePZ	21	13	25
		USCGS H 21 02 09.6			
		12.8 N 143.5 E			
		Mariana Islands			
		depth about 138 km			

Date	Phase	h	m	s
	Quetta			
1	ePZ	05	38	05
1	iPgZ	10	18	23 d
	iSgNE			38
1	eXZ	20	30	0
2	ePZ	02	13	41
	eXZ		14	56
2	eXZ	08	40	0
2	eXZ	08	54	0
2	eXZ	09	19	08
2	ePgZ	10	36	40
	eSgNE			54
2	eXZ	15	52	0
2	ePgZ	18	53	34.1
	eSgZN			46.1
2	ePZ	19	45	38
	eSN		46	04
2	ePZ	20	12	30
	eXZ			38
2	ePZ	21	08	30
3	eXZ	10	10	18
3	ePgZ	18	46	45
	eSgN			47
3	ePZ	19	09	57
	eSN		11	17
4	e(P)Z	04	12	04
	e(S)N			13 01
4	ePZE	04	49	54
	eSNE			51 23

Date	Phase	h	m	s
4	ePZ	10	09	59
	eSNE			11 16
4	ePZ	11	09	53
	e(S)NE			10 06
	eSNE			09
4	ePgZ	12	51	25.5
	iSgNE			39.6
4	ePgZ	12	53	27.8
	eSgNE			40.2
4	e(P)Z	22	24	21
	eSN			51
5	ePgZ	07	46	46.4
	eSgZNE			48.2
5	ePgZ	09	38	23.8
	eSgZN			25.7
5	ePgE	14	34	28.7
	eSgE			40.1
6	eXZ	08	35	11
6	ePZ	09	58	03
	eSNE			59 41
7	ePZE	19	55	01
8	ePZ	09	37	27 d
	iSNE			44
8	ePZ	10	41	51
	eSN			42 07
8	eXZ	11	02	0
8	ePgZ	18	08	27.7
	eSgN			36.2
9	eXZ			53 44
9	ePZ	16	47	10

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
10	eSZNE	31	14	ePZ	07 16 17
	ePgZ	03 47 12.6 d		eSNE	17 36
	eSgNE	23.5	14	eXZ	10 10 26
10	ePgZ	06 26 01.2		ePgZNE	30
	eSgN	02.9	14	ePZ	12 28 17
10	eXZ	07 46 31		e(S)E	40
10	ePZ	07 48 40	14	ePZ	19 20 36
	eSN	49 06		e(S)N	21 04
10	ePZ	12 22 35	15	ePZ	03 58 07
	eSNE	24 00		eSN	37
10	ePgZ	21 06 30	15	ePZ	06 59 12
	eSgN	54		eSZNE	07 00 31
11	eXZ	11 46 54	15	ePgZ	18 48 35.3
	eXZ	48 09		eSgNE	40
11	eXZ	12 10 48	15	ePE	19 29 31
11	eXZ	13 11 37		eSE	30 57
11	ePgZ	19 21 00.1	15	ePE	23 02 26
	eSgZN	03	15	ePE	23 07 08
11	ePZ	20 55 55	15	ePZ	23 46 02
	eSNE	57 25		eXE	47 12
11	eXZ	22 23 00	16	eXZN	05 07 51
11	ePgZ	22 39 50	16	ePgZ	12 51 10.8
	eSgN	56		iSgNE	21.8
13	ePZ	00 43 07	16	ePgZ	22 22 01
	eSN	44 27		eSgN	13.0
13	eXZ	11 01 20	17	ePZ	12 06 08
13	eXZ	14 00 56		eSZNE	47
13	ePgZ	16 23 52.6	17	ePZ	20 40 01
	eSgNE	24 03.0	18	ePZN	01 50 49
13	ePZ	19 51 13		eSEN	53 04
	e(S)N	52 04			

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
18	ePZ	18 22 06	25	ePZ	01 05 53
	eSN	23 27	25	ePZ	12 36 55
18	ePZ	22 03 55		eSN	38 41
	eSN	05 16	25	ePZ	19 19 23
19	ePZ	21 25 06	26	ePgZ	12 06 23
	e(S)N	38		eSgNE	33
20	ePZ	07 11 46	26	eXZ	12 09.0
	eSN	13 16	26	ePZ	12 41 28
20	ePgZ	10 04 27.4		eSE	47
	eSgN	38.8	26	e(P)E	14 07 52
20	ePZ	12 39 32		eSNE	09 51
	eSN	59	26	iPgZ	15 23 34.4
20	ePgZ	16 14 00.7		iSgN	36.4
	eSgNE	11.9	26	ePZ	17 43 23
20	eXZ	17 08	26	ePZ	17 50 02
20	ePgZ	17 53 32.0	26	ePZ	18 59 37
	eSgZN	42.9	26	ePZ	20 58 40
21	ePZ	06 07 37		eSN	59 03
	eSN	08 12	27	eXZ	05 29 21
21	ePZ	12 09 58	27	eXE	07 13 52
	eXZ	10 23		eXZE	16 11
21	eXZ	19 34 43	27	ePZ	10 33 11
21	ePZ	21 19 45		e(S)E	34 33
	eSN	20 54	27	ePgZ	23 52 34
22	eXZ	14 33 24		eSgZN	44
23	eXZ	09 18.0	28	eXZN	06 38 24
24	ePZ	05 15 47	28	ePZ	13 18 38
24	eXN	06 16.0		eSNE	19 03
24	eXZ	08 08 49	28	ePZ	15 22 52
25	ePZ	00 10 32		eSNE	23 24

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
29	ePZ	08 26 29	8	ePN	03 39 51
	eSN	48	8	ePN	11 00 12
31	ePZ	20 05 57	9	ePN	05 05 57
	eSZNE	06 17	10	ePN	06 27 32
	Warsak		10	ePN	10 29 31
				eSN	30 08
1	iPZ	06 01 17 c	10	ePN	12 21 38
1	iPZ	20 29 27 d		eSN	22 06
2	iPZ	02 12 35 d	10	ePN	19 58 41
	iSZ	13 02		eSN	59 12
2	iPZ	09 51 26 c	11	ePN	01 08 59
	iSZ	52 08	11	ePN	02 33 08
2	iPZ	10 48 14 d	11	ePN	22 10 47
	iSZ	49 05		eSN	11 22
2	ePZ	15 51 18	12	ePN	00 40 41
3	ePN	19 08 54		eSN	41 24
	eSN	09 33	12	ePN	19 25 41
4	iPN	10 08 53	13	ePN	00 42 08
	eSN	09 26		eSN	39
5	ePN	05 23 17	13	ePN	20 49 38
	eSN	47		eSN	51 11
5	ePgN	07 34 38.0	13	ePN	22 47 18
	eSgN	49.4		eSN	48
5	ePN	16 51 14	14	iPZ	07 15 12 d
	eSN	48	15	iPZ	06 58 12 d
6	ePN	09 57 10		iSZ	43
	eSN	38	15	iPZ	23 45 45 d
6	ePN	19 12 16	16	iPZ	19 24 27 d
8	ePZ	01 57 01	18	iPZ	01 49 33 d
	eSN	27		iSZ	50 58

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
18	ePZ	07 45 37		Lahore	
	iSZ	46 17	2	ePZ	20 12 02
18	ePZ	18 21 06	2	ePZ	23 03 28 ±
	iSZ	37	10	ePZ	19 59 03
18	iPZ	22 02 50	11	ePZ	13 04 46
	iSZ	03 19	16	ePZ	04 04 43
19	iPZ	08 03 29 d	20	ePZ	02 22 23
20	ePZ	07 10 44	25	ePZ	19 40 14
	iSZ	11 20	29	ePZ	07 47 49 c
20	ePZ	09 27 56	29	eXZ	17 57 51
21	ePN	19 41 01	29	ePZ	19 31 03
21	ePN	21 19 29		Karachi	
	eSN	20 01	9	eXE	10 39 06
22	ePN	06 15 28		Chittagong	
22	ePN	07 07 33	1	e(L)N	21 49 28
	eSN	08 34		eXN	54 33
23	ePN	22 20 59	2	eXN	22 57 50
	eSN	21 26		e(P)N	58 54
26	ePN	19 21 31	4	eXZ	02 43.0
26	ePN	20 15 10	4	eXN	05 13 30
27	ePN	02 20 51	4	eSN	14 27
28	ePN	05 21 34	5	e(L)N	13 59 38
	eSN	58		eXN	14 01 10
28	ePN	06 36 24	6	eXN	21 09 05
	eSN	51	12	e(L)N	03 44 40
28	ePN	15 13 01		eXN	45 44
30	ePN	00 03 24	15	ePZ	22 58 19
30	ePN	04 04 09		e(S)Z	35
	eSN	25	18	eSN	00 30 22
31	ePgN	01 56 20	19	eXN	31 14
	eSgN	30		eXN	16 48 52
				eSN	49 54

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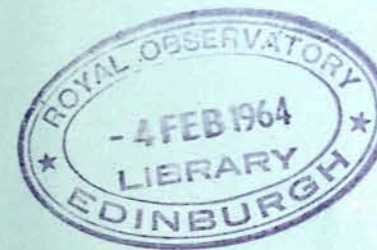
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CONTENTS

1.	Particulars of Stations and Instruments	1
2.	Major shocks	3
3.	Local and Minor shocks	22

Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Quetta (Central Station)				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Contd.)

Seismological Bulletin of Pakistan
Volume 7 No. 6, June 1961

Major Shocks

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
c=compression, d=dilatation, X=unidentified phase.
Mu=Actual ground motion of the indicated phase in microns.
Sec=Period of the indicated phase in seconds.
(Pas), (Berk), (Up), (Ki), (Pal) stand for seismological observatories Pasadena (U.S.A.),
Berkley (U.S.A.), Uppsala (Sweden), Kiruna (Sweden) & Palisade (U.S.A.) respectively.
All times are in Greenwich Mean Time.

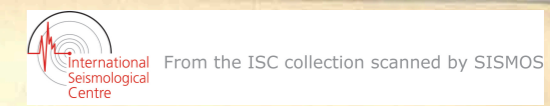
Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
1	Qt	ePZ	12	50	03		Lh	ePE		16	17	
1	Qt	ePZ	18	56	18			ePPE		17	44	
		USCGS H 18 46 31.2						USCGS H 00 08 59.8				
		6.7 N 123.1 E						10.3 N 39.6 E				
		Celebes Sea						Ethiopia				
		depth about 87 km						depth about 64 km				
1	Qt	ePZE	21	13	49							
1	Kr	ePZ	23	35	27							
	Qt	ePZ			47	2	Qt	ePZ		00	27	51
		ePPZEN*			36	2	Qt	ePZ		01	04	35
		iSEN*			41	2	Qt	ePZ		01	22	43
		eLE			43.0			USCGS H 01 16 10.6				
	Lh	ePZ			36			9.7 N 39.7 E				
		esPZ			37			Ethiopia				
		ePPZ			38			depth about 60 km				
		eSZE			42							
		USCGS H 23 29 21.1				2	Kr	ePZ		04	57	26
		10.6 N 39.3 E					Qt	ePZ				42
		Ethiopia						ePPE				58
		depth about 51 km						esSE				05
		Mag 6 1/2 - 6 3/4 (Pas)					Wr	ePN				04
2	Qt	ePZ			00		Lh	ePZ				04
		USCGS H 23 56 48.6						USCGS H 04 51 10.4				
		10.0 N 39.6 E						9.8 N 40.0 E				
		Ethiopia						Ethiopia				
		depth about 60 km						depth about 41 km				
2	Qt	ePZ			00			Mag 6 1/4 - 6 1/2 (Pas)				
		USCGS H 00 01 45.4										
		10.5 N 39.5 E				2	Qt	ePZ		05	29	05
		Ethiopia					Wr	ePN				46
		depth about 29 km						USCGS H 05 22 29.1				
2	Qt	ePZ			00			10.3 N 39.6 E				

Date	Station	Phase	h	m	s
2	Qt Wr	Ethiopia depth about 26 km ePZ	05	51	23
		ePZ		52	05
2	Qta	USCGS H 05 44 52.4 10.3 N 39.8 E Ethiopia depth about 36 km ePZ	06	23	45
		USCGS H 06 17 13.3 10.5 N 39.7 E Ethiopia depth about 36 km ePZ	07	09	19
2	Qt Wr	ePN	10	04	
		USCGS H 07 02 52.4 10.3 N 40.0 E Ethiopia depth about 54 km ePZ	07	28	16
2	Lh	ePZ	18	19	55
2	Wr Qt	ePN	20	10	
		ePZ			40
3	Lh Qt	USCGS H 18 09 25.9 21.3 N 145.9 E Mariana Islands region depth about 42 km ePZ	01	24	01
		ePNE			36
3	Kr	USCGS H 01 13 25.4 56.1 N 164.8 E Off east coast of Kamchatka depth about 29 km			
		H 07 33 09 33½ N 82 E			

4

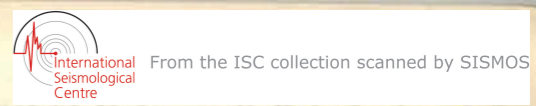
Date	Station	Phase	h	m	s
4	Lh Wr Qt	Western Tibet depth about 50 km USCGS H 07 33 05.4 33.8 N 81.8 E Tibet depth about 46 km Mag 6½ (Pas)			
		ePZ	07	45	27
4	Lh Qt	ePZ	46	52	
		USCGS H 07 43 43.6 34.2 N 82.2 E Tibet depth about 30 km ePZ	08	51	35
4	Wr Qt	ePN	11	19	22
		eSN			59
4	Lh Qt	ePZ			59
		eSE	21	04	
5	Qt Lh	ePZ	03	33	34
		eSNE			35 34
5	Qt Lh	ePZ	06	14	07
		eSE			16 08
5	Qt Lh	ePZ	17	42	20
		eSE			

5



Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
6	Qt	ePZ			50	7	Qt	ePZ	19	29	45
	Wr	ePN	20	58	07			USCGS H	19	18	28.5
		eSN			59 30			1.0 S	134.1	E	
	Lh	ePZ			58 23			Western New Guinea			
		eSE			59 55			depth about 59 km			
	Qt	ePZ			18	8	Qt	ePZ	01	11	05
		eSNE	21	01	40	8	Wr	ePN	04	00	06
								eSN			35
	H	20 56 15					Lh	ePZ			39
		39½ N 78½ E						eSE			01 44
		Western Sinkiang					Qt	ePZ			06 c
		Province, China						eSNE			02 25
		depth about 60 km									
		USCGS H 20 56 14.7						H	03 59 25		
		39.3 N 77.9 E						35½ N 71½ E			
		Sinking Province, China						Hindukush			
		depth about 38 km						depth about 250 km			
7	Qt	ePZ	13	14	31			USCGS H	03 59 21.3		
								36.2 N 71.0 E			
		USCGS H	13 05 51.2					Hindukush			
		42.8 N 130.5 E						depth about 264 km			
		Korea - China border									
		depth about 300 km									
7	Qt	ePZ	14	27	47	8	Qt	ePZ	16	36	00
		eXZ			28 09	9	Wr	ePN	03	56	23
		eSN*			38 10			iSN			52
	Wr	ePN			28 08		Lh	ePZ			36
								eSE			57 18
	Lh	ePZ			18		Qt	ePZ			35 d
								eSN			59 00
		USCGS H	14 15 18.9					H	03 55 44		
		5.4 S 11.6 W						34½ N 74 E			
		Ascension Islands region						Kashmir - Pakistan			
		depth about 17 km						border			
		Mag 5½ - 5½ (Pal)									

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H	03 55 51.4					USCGS H	22 05 50.0		
		34.5 N 73.8 E						7.6 S 122.3 E			
		Northern India						Flores Sea			
		depth about 110 km						depth about 25 km			
9	Qt	ePZ	09	40	50 c	10	Qt	ePZ	11	44	26
		ePPZ			41 07			USCGS H	11 32 13.5		
		eSNE			44 03			51.2 N 179.0 W			
	Wr	ePN			41 01			Andreanof Islands,			
	Lh	ePZ			31 ±			Aleutian Islands			
		H	09 36 49.45					depth about 28 km			
		41 N 50 E									
		Caspian Sea									
		USCGS H	09 36 49.2								
		depth about 17 km									
9	Qt	ePZ	14	33	01 d	10	Qt	ePKPZ	12	04	22
		USCGS H	14 73 25.1				Wr	ePKPN			29
		29.3 N 139.4 E						USCGS H	11 44 49.8		
		South of Honshu, Japan						32.0 S 70.3 W			
		depth about 466 km						Sanjuan Province,			
								Argentina			
								depth about 83 km			
9	Lh	ePZ	15	24	15	10	Kr	iPnZ	13	06	35 d
	Qt	ePZ			53 c			iSnE			07 08
		USCGS H	15 17 50.7				Qt	ePnZ			06 47 c
		5.5 N 95.8 E						ePgZE			07 00
		Near coast of Sumatra						eSnNE			29
		depth about 100 km						iSgNE			44
9	Qt	ePZ	15	53	10			H	13 05 51		
		USCGS H	15 43 03.1					Mekran Range			
		30.0 N 140.1 E						West Pakistan			
		South of Honshu, Japan									
		depth about 170 km									
9	Qt	ePZ	22	16	33	10	Qt	ePKPZ	20	52	02
								ePPZNEN*			57 25
								eiXN*			58 02
								USCGS H	20 31 50.9		

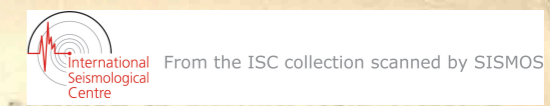


Seismological Bulletin of Pakistan
Volume 7 No. 6, June 1961

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		24.1 S 112.1 W						USCGS H 05 10 26.0			
		Easter Islands region						28.9 N 54.6 E			
		depth about 47 km						Southern Iran			
		Mag 5½ - 5¾ (Pal),						depth about 38 km			
		6 (Pas)						Mag 6½ - 6¾ (Pal),			
11	Qt	ePZ	04	13	44	11	Qt	ePZ	05	32	49
		USCGS H 04 02 41.3					Lh	ePZ		34	12
		51.4 N 159.2 E						USCGS H 05 30 05.9			
		Kamchatka						27.3 N 54.5 E			
		depth about 24 km						Southern Iran			
11	Qt	ePZ	05	13	04 c			depth about 25 km			
		iPPZNE			12	11	Qt	ePZ	05	44	40
		iSNE			15 06	11	Qt	ePZ		05	51 59
		Mu Sec				11	Qt	ePZ		05	56 21
		PZ 2.3 1.0				11	Qt	ePZ		06	03 58
		PE 1.7 1.0						USCGS H 05 52 51.7			
		PE 1.2 1.0						51.4 N 159.3 E			
		Δ = 10°·5						Near south coast of			
								Kamchatka			
Kr		ePZ	05	13	12±			depth about 18 km			
		ePPPZ			30	11	Qt	ePZ		06	05 19
Wr		ePN			14 06	11	Qt	ePZ		06	13 17
Lh		ePZ			27	11	Qt	ePZ		06	22 02
		ePPZ			40	11	Qt	ePZ		06	29 31
		eSE			17 36	11	Qt	ePZ		06	34 38
Ch		ePZ			13	11	Qt	ePZ		06	42 05
		ePPPZ			18 41	11	Qt	ePZ		06	49 22
		eSSN*			24 46		Wr	ePN		50	27
		H 05 10 29					Lh	ePZ			46
		28 N 54¾ E						USCGS H 06 46 54.1			
		Southern Iran						29.3 N 55.2 E			

Seismological Bulletin of Pakistan
Volume 7 No. 6, June 1961

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Iran				11	Qt	ePZ	12	33	03
		depth about 25 km					Wr	ePZ		34	07
11	Qt	ePZ	06	53	51		Lh	ePZ			27
		USCGS H 06 51 29.0						USCGS H 12 30 21.3			
		28.1 N 54.7 E						27.5 N 54.4 E			
		Southern Iran						Iran			
		depth about 42 km						depth about 56 km			
11	Qt	ePZ	07	08	57	11	Qt	ePZ	12	34	06
11	Qt	ePZ			07 32 09		Kr	ePZ			12
11	Qt	ePZ			08 06 40		Wr	ePZ			35 07
		USCGS H 08 04 13.5					Lh	ePZ			30
		29.3 N 55.6 E						USCGS H 12 31 26.8			
		Iran						28.2 N 54.6 E			
		depth about 25 km						Iran			
11	Qt	ePZ	08	41	16			depth about 36 km			
11	Qt	ePZ			09 18 01			depth about 36 km			
11	Qt	ePZ			09 24 14	11	Qt	ePZ			12 45 22
	Wr	ePZ			25 18			USCGS H 12 42 58.7			
	Lh	ePZ			37			30.2 N 55.3 E			
		USCGS H 09 21 42.3						Iran			
		29.0 N 55.1 E						depth about 61 km			
		Iran				11	Qt	ePZ			14 00 36
		depth about 19 km					Wr	ePN			01 47
11	Qt	ePZ	09	53	04		Lh	ePZ			58
11	Qt	ePZ			10 05 41			USCGS H 13 57 58.6			
11	Qt	ePZ			11 26 4. c			27.6 N 54.6 E			
	Lh	ePZ			28 11			Southern Iran			
		USCGS H 11 24 10.9						depth about 42 km			
		28.5 N 54.6 E				11	Qt	ePZ			15 08 58 d
		Iran					Lh	ePZ			10 19
		depth about 31 km						USCGS H 15 06 17.3			



Seismological Bulletin of Pakistan
Volume 7 No. 6, June 1961

Major Shocks

Date	Station	Phase	h	m	s
		27.8 N 54.6 E			
		Southern Iran			
		depth about 63 km			
11	Qt	ePZ	15	36	32
11	Ch	ePZ	17	17	11±
		eSN*	18	22	
	Lh	ePZ	20	31	
	Qt	ePZ	21	29	c
		epPZ	39		
		ePPZNE	22	26	
		eSN*	26	18	
		esSNEN*	34		
		eLN*	27	5	
		USCGS H 17 15 30.0			
		24.3 N 98.4 E			
		Burma - China			
		border region			
		depth about 38 km			
11	Qt	ePZ	21	00	10
11	Qt	ePZ	22	11	32
		USCGS H 22 00 28.1			
		22.1 N 141.8 E			
		Volcano Islands			
		depth about 100 km			
11	Qt	ePZ	23	15	43
		eSNE	17	41	
		USCGS H 23 13 07.7			
		28.5 N 54.6 E			
		Iran			
		depth about 25 km			

10

Seismological Bulletin of Pakistan
Volume 7 No. 6, June 1961

Major Shocks

Date	Station	Phase	h	m	s
		USCGS H 21 02 47.5			
		28.8 N 54.8 E			
		Iran			
		depth about 60 km			
12	Qt	ePZ	21	51	06
		eSNE	53	02	
	Lh	ePZ	52	28	
		USCGS H 21 48 34.8			
		28.6 N 55.1 E			
		Iran			
		depth about 35 km			
12	Qt	ePZ	23	19	47
12	Qt	ePZ	23	43	14
13	Qt	ePZ	01	12	49
13	Qt	ePZ	02	36	41
		USCGS H 02 24 25.9			
		51.9 N 176.5 W			
		Andreanof Islands,			
		Aleutian Islands			
		depth about 56 km			
13	Qt	ePZ	03	16	48
13	Qt	ePZ	04	29	19
13	Qt	ePZ	06	06	20
13	Qt	ePZ	09	49	31
13	Qt	ePZ	10	30	55
13	Qt	ePZ	11	45	47
13	Qt	ePZ	12	05	17
	Qt	ePZ	53		
		USCGS H 11 55 44.1			
		0.0 121.5 E			

11

Celebes
depth about 20 km

Date	Station	Phase	h	m	s
13	Qt	ePZ	12	16	50
		eSNE	18	47	
13	Qt	ePZ	17	48	50
13	Lh	ePKPZ	21	56	25
	Wr	ePKPN	31		
	Qt	ePKPZ	39	d	
		USCGS H 21 37 55.0			
		21.4 S 176.4 W			
		Tonga Islands region			
		depth about 146 km			
14	Qt	ePZ	00	27	03 d
		eSNE	28	58	
		USCGS H 00 24 30.8			
		28.3 N 54.9 E			
		Iran			
		depth about 62 km			
14	Ch	ePZ	00	42	05
		eSN*	45		
	Lh	ePZ	45	34	
		eSE	48	55	
	Wr	ePZ	46	09	
		eSN	50	05	
	Qt	ePZ	46	36	
		eXZ	50		
		ePPZNEN*	47	06	
		eLN*	51	3	
		H 00 41 19			
		24½ N 94 E			

Seismological Bulletin of Pakistan
Volume 7 No. 6, June 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Assam - Burma border						ePPZ	41	11	
		USCGS H 00 41 10.3						eSE	45	36	
		24.5 N 95.0 E						USCGS H 20 32 24.0			
		Northern Burma						10.8 N 40.1 E			
		depth about 52 km						Ethiopia			
14	Qt	ePZ	04	45	34			depth about 56 km			
14	Qt	ePZ	06	08	47	15	Qt	ePZ	06	24	13 d
14	Qt	ePZ	06	52	00			esPZ		39	
14	Qt	ePZ	09	06	12			eSNEN*	26	07	
	Wr	ePZ	07	15				eLN*	26	6	
	Lh	ePZ		36			Wr	ePZ	25	14	
		USCGS H 09 03 40.0					Lh	ePZ		36	
		28.7 N 55.3 E						H 06 21 44			
		Iran						28 N 54.5 E			
		depth about 60 km						Southern Iran			
14	Qt	ePZ	09	16	36			depth about 100 km			
		USCGS H 09 07 34.7						USCGS H 06 21 40.1			
		20.1 N 121.5 E						27.8 N 54.8 E			
		Off north coast of						Southern Iran			
		Luzon,						depth about 113 km			
		Philippine Islands				15	Wr	ePZ	20	51	01
		depth about 25 km					Lh	ePZ		42	
14	Qt	ePZ	19	00	46			eSN	53	15	
14	Qt	ePZ	20	38	48		Qt	ePZ	51	55	
		ePPZN*	39	57				eSN	53	35	
		iISSN*	44	07				H 20 49 45			
		iISSN*	45	57				38.5 N 70 E			
		eLN*	47	9				Tadzhik, S. S. R.			
	Wr	ePZ	39	33				USCGS H 20 49 42.3			
	Lh	ePZ		42				38.9 N 70.0 E			

12

Seismological Bulletin of Pakistan
Volume 7 No. 6, June 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Tadzhik, S. S. R.						41.1 S 74.5 W			
		depth about 45 km						Off coast of southern			
15	Lh	ePZ	23	34	44			Chile			
	Wr	ePZ		48				depth about 17 km			
	Qt	ePZ	35	25	c	16	Qt	ePZ	08	48	12
		epPZ		34				eSNE	50	10	
		eSN*	44	05				USCGS H 08 45 37.8			
		Mu Sec						28.7 N 55.1 E			
		PZ 0.4 1.3						Iran			
		$\Delta = 65^\circ \cdot 8$						depth about 25 km			
		USCGS H 23 24 40.5				16	Wr	ePKPZ	10	50	50
		45.4 N 151.3 E					Qt	ePKPZ		50	d
		Kurile Islands						epPKPZ	51	21	
		depth about 38 km						ePPZN	52	41	
		Mag 6.2 (Qt)						ePKSZE	53	52	
16	Qt	ePZ	03	28	42		Lh	ePKPZ	50	54	
		USCGS H 03 17 56.5						ePKSE	54	08	
		45.6 N 151.3 E						USCGS H 10 31 56.2			
		Kurile Islands						8.8 N 73.4 W			
		depth about 25 km						Northern Colombia			
16	Qt	ePZ	06	43	46	16	Qt	ePZ	16	19	49
		USCGS H 06 31 43.4						USCGS H 16 10 06.3			
		51.4 N 173.2 W						11.1 N 125.0 E			
		Andreanof Islands,						Near north coast of			
		Aleutian Islands						Mindanao,			
		depth about 25 km						Philippine Islands			
16	Qt	ePKPZ	07	28	03 d			depth about 63 km			
		ePKSZNE	31	37							
	Wr	ePKPZ	28	13		17	Wr	iPN	01	48	43
		USCGS H 07 08 16.5						iSN	49	14	
							Qt	ePZ		42	

13

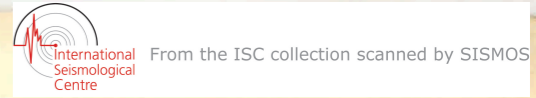
Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSNE	50	58				border			
		H 01 48 03						depth about 147 km			
		Hindukush						Mag 6 (Pas)			
17	Qt	ePZ	08	08	29 d	17	Wr	ePZ	15	35	38
		eSNE	10	27			Qt	ePZ			54
	Wr	ePN	09	32				USCGS H 15 24 17.8			
	Lh	ePZ		51				3.7 S 138.2 E			
		H 08 05 58						Central New Guinea			
		27½ N 55½ E						depth about 139 km			
		Southern Iran				17	Qt	ePKPZ	18	58	57
		USCGS H 08 05 54.5						USCGS H 18 39 51.4			
		28.7 N 55.3 E						14.5 N 92.1 W			
		Southern Iran						Near coast of			
		depth about 25 km						Guatemala			
17	Qt	ePZ	08	56	38			depth about 120 km			
		eSNE		58	38	18	Lh	ePZ	03	20	55
17	Qt	ePKPZ	11	16	02		Wr	ePZ		21	19
	Lh	ePKPZ			09		Qt	ePZ			26
		USCGS H 10 56 30.3						eSN*		23	31
		11.9 S 75.3 W						USCGS H 03 12 35.7			
		Peru						5.9 S 113.0 E			
		depth about 29 km						Java Sea			
		Mag 5 (Pal)						depth about 641 km			
17	Wr	ePKPZ	15	26	37	18	Lh	ePZ	03	35	22
	Qt	ePKPZ			39		Wr	ePZ			51
		ePPN*			29 00		Qt	ePZ			36 40
		ePKSZNN*			30 07	18	Lh	ePZ	06	27	48
		e!XZE			21		Wr	ePN		28	14
		USCGS H 15 07 36.1					Qt	ePZ		29	12
		14.2 N 92.2 W						eSN		31	39
		Mexico - Guatemala						H 06 26 05			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		33½ N 82½ E						Qt	ePKPZ	33	03
		Tibet						Wr	ePKPZ		07
		depth about 50 km						USCGS H 22 13 30.0			
		USCGS H 06 26 05.3						56.7 S 141.1 W			
		33.8 N 82.0 E						South of Pacific Ocean			
		Tibet						depth about 92 km			
		depth about 45 km				18	Qt	ePZ		00	26 49
18	Qt	ePZ	10	12	41	19	Qt	ePZ		01	54 44 d
		eSNE		14	37			USCGS H 01 45 29.9			
	Wr	ePN		13	45			12.6 N 121.9 E			
		USCGS H 10 10 13.8						Luzon,			
		29.0 N 55.0 E						Philippine Islands			
		Iran						depth about 120 km			
		depth about 21 km				19	Qt	ePZ		02	32 13
18	Qt	ePZ	10	54	43 d			USCGS H 02 22 48.3			
		eSNE		56	42			12.5 N 122.2 E			
	Lh	ePZ			06			Near south coast of			
		USCGS H 10 52 07.5						Luzon,			
		28.3 N 54.6 E						Philippine Islands			
		Iran						depth about 20 km			
		depth about 25 km				19	Wr	ePZ		02	55 34
18	Qt	ePZ	13	32	05		Qt	ePZ		56	14 e
		USCGS H 13 21 55.9						USCGSH 02 46 03.6			
		0.2 N 123.9 E						39.3 N 142.9 E			
		Clebes						Off east coast of			
		depth about 91 km						Honshu, Japan			
18	Qt	ePZ	14	13	27 d			depth about 85 km			
18	Qt	ePZ	14	54	08	19	Qt	ePZ		04	40 41
		eSNE		56	07	19	Lh	ePZ		07	47 59
18	Lh	ePKPZ	22	32	55		Wr	ePZ		48	05

Date	Station	Phase	h	m	s
	Qt	ePZ			40
		ePPZ		50	57
		eSNE		56	50
		esSN*		57	24
		USCGS H 07 38 29.6			
		39.2 N 142.9 E			
		Off east coast of Honshu, Japan			
		depth about 98 km			
19	Lh	ePZ	08	09	12
	Wr				18
	Qt	ePZ			54
		USCGS H 07 59 38.1			
		39.7 N 142.6 E			
		Near east coast of Honshu, Japan			
		depth about 23 km			
19	Wr	iPN	17	05	21.1
	Lh	iPZ			59 d
		isPZ		06	41
		eSE			58
	Qt	iPZ			19 d
		esPZE		07	07
		eSZNEN*			35
		Mu Sec			
		PZ 7.3 1.3			
		$\Delta = 6^{\circ}.7$			
	Kr	iPZ	17	07	21 d
		isPZ		08	10
		eSE		09	26
		Mu Sec			
		PZ 4.8 1.2			

Date	Station	Phase	h	m	s
		ePPZ		31	51
		USCGS H 03 21 26.5			
		11.5 N 44.5 E			
		Gulf of Aden			
		depth about 30 km			
20	Qt	ePKP ₂ Z	04	41	50
		USCGS H 04 22 02.1			
		38.3 S 74.1 W			
		Off coast of southern Chile			
		depth about 25 km			
20	Qt	ePZ	10	18	33
		eSNE		20	35
20	Qt	ePKPZ	14	45	24
		USCGS H 14 27 02.6			
		21.8 S 169.3 E			
		Loyalty Islands			
		depth about 64 km			
21	Qt	ePZ	06	42	00
		ePPPZE			16
		eSZNE		43	59
		eLN*			44.3
	Kr	ePZ		42	04
		eSE		44	07
	Wr	ePN		43	03
	Lh	ePZ			23
	Ch	ePZ		46	07
		H 06 39 25			
		27.5 N 55 E			
		Southern Iran			
		USCGS H 06 39 22.8			

Date	Station	Phase	h	m	s
		27.9 N 55.0 E			
		Iran			
		depth about 48 km			
21	Qt	ePZ	07	46	13
		USCGS H 07 33 34.4			
		7.7 S 146.7 E			
		Eastern New Guinea			
		depth about 25 km			
21	Qt	ePZ	09	13	19
		USCGS H 09 04 19.4			
		8.4 N 124.4 E			
		Near north coast of Mindanao			
		Philippine Islands			
		depth about 615 km			
21	Qt	ePZ	14	18	34
21	Qt	ePZ	15	44	36
21	Qt	ePZ	16	11	18
21	Qt	ePZ	16	48	07
		USCGS H 16 37 37.1			
		5.9 S 128.5 E			
		Banda Sea			
		depth about 389 km			
21	Qt	ePZ	19	17	13
		ePPPZE			28
		eSZN			19 12
		eLN*			19.6
	Kr	ePZ			17 21
	Wr	ePZ			18 16
	Lh	ePZ			35



Seismological Bulletin of Pakistan
Volume 7 No. 6, June 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		H 19 14 40						eSKSN*	20	44	
		28 N 55½ E						e!XN*	23	29	
		Southern Iran						USCGS H 08 55 55.2			
		USCGS H 21 14 41.9						43.9 N 128.9 W			
		28.6 N 55.2 E						Off coast of Oregon			
		Iran						depth about 56 km			
		depth about 89 km						Mag 5¼ - 5½ (Berk),			
21	Lh	ePZ	20	33	54			5½ - 6 (Pal)			
	Wr	ePZ	34	21		23	Lh	ePZ	11	14	15
	Qt	ePZ		24			Qt	ePZ		15	00
		e!XZ		39	13			USCGS H 11 04 59.1			
		eSNEN*		41	58			35.2 N 140.0 E			
		e!ScSNEN*		44	03			Honshu, Japan			
		USCGS H 20 25 00.9						depth about 138 km			
		7.6 S 110.0 E				23	Qt	ePZ	13	31	00
		Near north coast of						USCGS H 13 20 13.4			
		Java						46.9 N 153.9 E			
		depth about 163 km						Kurile Islands			
22	Qt	ePZ	01	03	34			depth about 35 km			
		USCGS H 00 56 04.7				23	Qt	ePZ	15	38	40
		42.4 N 19.6 E				23	Qt	ePZ	16	38	50
		North Albania -						esPZ		39	10
		Yugoslavia border						eSNEN*		40	50
		depth about 53 km						eLN*		41.4	
22	Qt	ePZ	09	07	50		Wr	ePZ	40	00	
		eSNE		09	48		Lh	ePZ		20	
	Wr	ePN		08	52			H 16 36 27			
		H 09 05 16						27 N 55½ E			
		Southern Iran						Southern Iran			
23	Qt	ePKPZ	09	14	20			depth about 60 km			

Seismological Bulletin of Pakistan
Volume 7 No. 6, June 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 16 36 28.0						Wr	ePZ	44	10
		28.5 N 55.5 E						USCGS H 12 40 31.8			
		Iran						29.0 N 54.2 E			
		depth about 54 km						Iran			
24	Lh	ePZ	09	42	48			depth about 90 km			
	Qt	ePZ		43	21	25	Qt	ePZ	16	30	39
		eXNE		49	32			USCGS H 16 21 53.0			
		USCGS H 09 36 08.8						18.9 N 121.3 E			
		4.1 N 97.5 E						Near north coast of			
		Sumatra						Luzon,			
		depth about 188 km						Philippine Islands			
24	Lh	ePZ	16	30	43			depth about 143 km			
	Wr	ePZ		31	10	25	Lh	ePZ	16	56	58
	Qt	ePZ		25			Wr	ePZ		57	10
		USCGS H 16 19 23.7					Qt	ePZ		40	
		4.6 S 144.9 E						eSN*		17	06
		Near north coast of						eScSN*		07	36
		New Guinea						eSSN*		11	16
		depth about 212 km						eLN*		14.6	
24	Lh	ePZ	19	45	05			USCGS H 16 46 32.9			
	Wr	ePZ		25				21.7 N 143.1 E			
	Qt	ePZ		41				North of Mariana Islands			
25	Lh	ePZ	02	39	07			depth about 13 km			
	Qt	ePZ		48				Mag 5¼ (Berk)			
		USCGS H 02 29 29.9				25	Qt	ePZ	19	51	47
		40.8 N 144.1 E					Lh	ePZ		52	01
		Near north coast of				26	Ch	ePZ	14	58	23
		Honshu, Japan					Wr	ePN		43	
		depth about 57 km					Lh	ePZ		46	00
25	Qt	ePZ	12	43	09 d		Qt	ePZ		59	15

Date	Station	Phase	h	m	s
		ePcPZ			25
		ePPZNE	15	02	01
		ePPPZN		04	00
		eSN*		08	59
		ePSN*		09	44
		eLN*		19	6
	USCGS H		14	47	26.1
			52.4 N	174.5 E	
			Near Islands		
			Aleutian Islands		
			depth about 60 km		
			Mag $5\frac{1}{2}$ - $5\frac{3}{4}$ (Pal)		
27	Qt	ePZ		00	51 49
27	Qt	ePZ		03	34 44
	USCGS H		03	22	09.2
			53.6 N	163.4 W	
			Unimak Islands region		
			depth about 93 km		
27	Ch	ePZ		07	05 56
		ePPZ		06	02
		iPPPZ			12
		eSZ		07	36
		eS ₂ Z		08	03
	Lh	ePZ			33
		iSZ		12	36
	Wr	ePN		09	05
		eSN		13	33
	Qt	ePZ		09	38 ^c
		ePPZNE*		10	33
		ePPPZEN*			44

Date	Station	Phase	h	m	s
27	Lh	ePZ	22	01	00
	Wr	ePN			26
	Qt	ePZ		02	00
	USCGS H		21	56	01.8
			27.5 N	99.6 E	
			Yunan Province		
			China		
			depth about 38 km		
28	Lh	ePZ	04	27	21
	Wr	ePN			42
	Qt	ePZ		28	19
	USCGS H		04	21	53.8
			31.2 N	104.0 E	
			Szechwan Province		
			China		
			depth about 34 km		
28	Lh	ePZ	13	23	38 ^c
	Wr	ePN		24	01
	Qt	ePZ			05 ^c
	USCGS H		13	15	31.0
			4.7 S	102.7 E	
			Near south coast of		
			Sumatra		
			depth about 142 km		
29	Wr	ePZ	01	23	27
	Qt	ePZ			43
29	Qt	eXZ	09	40	24
		ePPZ		41	25
		e!SKSN*		47	48
		eSKKSN*		48	23

Date	Phase	h m s
Quetta		
1	ePZ	13 03 58
	eSNE	05 16
2	ePZ	04 21 01
	eSNE	22 29
2	ePZ	06 23 45
2	ePgZ	11 06 3.8
	eSgZN	48.8
3	ePgZ	17 19 23.0
	iSgZNE	27.3
4	ePgZ	08 24 38.3
	eSgN	46.3
4	ePgZ	20 00 32.1
	iSgNE	40.8
5	ePZ	02 42 47
	e(S)Z	44 45
5	ePZ	08 40 54
	eSNE	41 20
5	ePgZ	12 02 14
	eSgNE	26
5	ePZ	22 28 21
	eSNE	29 38
6	eXE	05 51.0
6	eXE	13 56 52
	eSE	57 03
6	ePZ	17 13 53
	eSNE	14 14
6	ePZE	22 28 01
	eSNE	29 16

22

Date	Phase	h m s
7	ePZ	03 25 35
	eSNE	27 35
8	ePZ	12 34 35
8	ePZ	15 52 53
8	e(P)Z	16 23 25
8	ePZ	23 09 09
9	ePZ	11 41 54
	eSN	42 23
9	ePZ	15 32 39
	eSE	58
9	ePZ	16 08 56
	e(S)N	10 24
10	ePZ	02 16 51
	eSNE	17 33
10	ePgZ	08 17 50±
	eSgNE	18 00
10	ePgZ	12 59 54
	eSgNE	13 00 04
10	eXE	14 56.0
11	eXZ	07 16 05
11	ePZ	07 19 46
11	ePZ	07 21 09
11	ePZ	07 26 46
11	eXZ	07 27 57
11	ePZ	07 41 31
11	ePZ	08 41 54
11	ePZ	08 43 36
11	ePZ	09 06 20
11	ePZ	09 13 16
11	ePZ	10 03 17

Date	Phase	h m s
11	eXZ	12 51 19
11	ePZ	13 37 08
	eSNE	35
11	eXZ	14 45.0
11	eXZ	14 50 13
11	ePgZ	14 53 06.2
	iSgZ	07.4
11	ePZ	16 11 08
11	ePZ	16 33 45
11	ePZ	16 55 48
11	ePZ	17 26 17
11	ePZ	17 34 40
11	ePZ	18 58 57
11	ePZ	19 25 13
11	ePZ	20 36 00
11	eXZ	20 40.0
11	ePZ	22 13 19
11	ePZ	22 15 07
	e(S)NE	17 06
11	ePZ	22 34 28
11	ePZ	23 43 57
12	ePZ	01 37 38
	eSNE	39 37
12	ePZ	03 19 50
12	ePZ	04 21 29
12	ePZ	05 11 49
	eSN	12 09
12	ePZ	07 06 08
12	ePZ	08 08 37
12	eXZ	08 17 34

23

Date	Phase	h m s
12	ePZ	10 22 32
	eXN	24 55
12	ePZ	10 58 14
12	ePZ	15 57 53
12	ePZ	17 20 15
12	ePZ	22 58 25
13	ePZ	01 46 46
13	ePZ	03 12 37
13	ePZ	04 05 00
13	ePZ	06 21 24
13	ePZ	09 54 01
13	eXZ	11 39.0
13	ePZ	12 37 59
	e(S)NE	40 00
14	ePZ	09 38 16
	eSNE	40 15
14	ePZ	13 02 21
	eSNE	03 45
14	ePZ	14 52 34
14	e(P)Z	17 33 40
	eXZ	34 24
14	ePZ	19 26 12
14	ePgZ	19 30 11
	eSgN	21
15	ePE	04 22 00
15	ePgZE	08 17 07.4
	eSgNE	16.6
15	ePgZ	10 34 33
	eSgE	46
15	ePE	11 46 16

Date	Phase	h m s	Date	Phase	h m s
	eSE	47 33		eSN	11 00 13
15	ePZ	19 59 26	24	ePE	04 00 09
16	ePZ	01 31 04		eSE	01 22
	eSNE	32 25	24	eXZ	15 26 01
17	ePgZ	10 33 06.7	25	ePgZ	09 30 26.7
	eSgNE	18.8		eSgE	40.3
17	ePZ	17 56 50	25	ePgE	09 33 39.1
	eSN	57 18		eSgE	52.3
17	eXZ	17 59 58	25	ePgE	09 40 38.8
17	ePZ	21 38 12		eSgE	51.1
17	ePZ	22 32 11	25	ePgE	11 49 30.1
18	ePZ	03 27 10		eSgE	41.1
18	ePZ	07 23 12	25	ePZE	11 52 22
	eSN	31		eSZNE	41
19	ePgZ	20 03 43.8	25	ePgZE	14 16 38.6
	eSgNE	45.0		eSgE	52.9
20	ePZ	18 20 17	25	ePgZE	15 00 46.8
	eXE	21 00		eSgE	01 01.5
20	ePZ	19 28 16	25	ePE	17 07 05
	eSNE	52		eSE	23
21	ePZ	00 33 50	25	ePZE	18 28 46
	e(S)N	35 27		eSE	30 14
21	ePZ	12 05 54	26	ePZ	14 43 22
	eSNE	06 19	26	ePZ	16 41 40
21	ePZ	18 14 20	26	ePgZ	19 49 24.1
22	ePZ	00 41 14		eSgZNE	34.5
	eSNE	43 10	27	ePZ	00 54 26
22	ePgZE	14 13 28.2		eSNE	55 05
	eSgNE	39.2	27	ePZ	01 52 34
23	ePZ	10 58 52		eSNE	54 52

Date	Phase	h m s	Date	Phase	h m s
27	ePgZ	03 48 01.8	3	ePN	01 45 01
	eSgNE	05.0		eSN	32
27	ePZ	11 59 26	3	ePN	05 32 31
27	ePgZ	12 31 16.5		eSN	51
	eSgN	19.9	3	ePN	10 26 15
28	ePZ	02 44 16	3	ePN	22 47 46
28	ePZ	03 09 46.7	4	ePN	11 36 21
	eSE	10 04.2	4	ePN	20 42 43
28	ePgZ	20 18 41.0	5	ePN	02 41 21
	ePgZNE	55.1		eSN	42 12
28	ePgZ	22 34 14	5	ePN	05 30 46
	eSgNE	29	5	ePgN	08 57 33.8
29	ePZ	03 39 46.4		eSgN	47.3
	eSNE	40 05	5	ePN	13 31 48
30	ePZ	16 37 01	5	ePN	13 47 50
	eSN	17.3	5	ePN	15 53 11
30	eXZ	20 08.0	5	ePN	16 41 01
30	ePZ	20 29 00		eSN	27
			5	ePN	22 27 51
				eSN	28 01
1	ePN	05 51 46	6	ePN	05 26 59
1	ePN	08 18 56		eSN	27 25
	eSN	19 35	6	ePN	22 26 58
1	ePN	13 03 00		eSN	27 26
	eSN	31	7	ePN	07 22 07
1	ePN	16 40 10	7	ePN	10 17 12
	eSN	49	7	ePN	10 38 47
2	ePN	04 58 27	8	ePN	15 52 55
2	ePN	21 02 07		eSN	53 29
	eSN	33	8	ePN	18 09 37

Date	Phase	h m s
	eSN	10 06
9	ePN	00 30 06
9	ePN	15 03 11
9	ePN	16 08 29
10	ePN	13 09 26
11	ePN	11 26 20
12	ePN	10 24 27
12	eSN	25 10
12	ePN	17 26 50
13	ePN	04 04 38
14	ePN	00 28 06
14	ePN	13 11 19
14	ePN	14 05 28
	eSN	52 15
14	ePZ	17 32 58
15	ePN	02 21 51
15	ePN	04 05 29
	eSN	55
15	ePN	11 45 12
	iSN	38
15	ePN	11 53 44
16	ePN	06 08 36
	eSN	58
16	iPN	10 30 03
	eSN	34
17	ePN	18 41 37
	eSN	42 07
18	ePN	03 28 17
18	ePN	10 51 40
18	ePN	11 57 16

26

Date	Phase	h m s
19	ePN	01 04 20
19	ePN	21 56 20
	eSN	55
20	ePN	05 56 32
	eSN	57 06
20	ePN	14 45 37
20	ePN	18 21 00
21	ePN	00 32 58
21	ePN	20 41 52
	eSN	43 57
22	ePN	08 36 38
22	ePN	17 57 57
	eSN	58 23
22	ePN	19 37 11
	eSN	34
23	ePN	10 16 58
23	ePN	10 57 15
	eSN	49
23	ePN	17 27 05
	eSN	34
24	ePN	03 59 00
	eSN	29
24	ePN	09 43 44
25	ePN	06 22 58
	eSN	23 15
25	ePgN	06 25 15.4
	eSgN	30.4
25	ePN	07 47 46
25	ePN	17 27 41
	eSN	28 19

Date	Phase	h m s
26	ePN	00 39 36
26	ePN	14 05 18
26	ePN	14 37 43
	eSN	38 09
26	ePN	19 18 29
27	ePN	01 51 24
27	ePN	02 04 06
27	ePN	08 02 39
27	ePN	11 58 50
27	ePN	18 51 00
	eSN	31
28	ePN	21 40 42
	eSN	41 14
28	ePN	23 21 07
29	ePN	08 19 13
	eSN	36
29	ePN	12 22 41
29	ePN	13 14 18
30	ePN	04 30 26
	Lahore	
2	eXZ	05 51 09
4	eXZ	20 40 56
8	eXZ	15 53 38
11	eXZ	06 55 28
12	ePZE	10 22 36
	eSE	23 14
12	eXZ	17 06 50
14	eXE	00 28 20
14	eXE	13 01 55

27

Date	Phase	h m s
	eSE	03 03
14	ePZ	17 33 30
	eSE	34 59
15	ePZ	11 46 50
16	ePZ	16 05 32
16	ePZ	16 19 04
17	eXZ	15 26 39
17	ePZ	18 41 48
	e(S)ZE	42 11
19	ePZ	08 09 12
20	ePZ	05 55 47
	iSE	56 14
20	ePZ	18 20 14
21	iXZ	20 38 54
22	ePZ	17 58 06
	eSE	38
23	ePZ	10 59 34
25	ePZ	18 28 17
26	ePZ	00 10 05
27	iPZ	01 53 14
30	eXZ	19 01 37
	Karachi	
4	eXZ	13 55 20
	eSE	58 08
5	eXE	03 33 39
	eXE	36 43
21	eXZ	20 34 07
	eXE	51

Date	Phase	h m s	Date	Phase	h m s
	Chittagong				
1	eXZ	23 51.0	20	eXZ	01 28.0
2	eXZ	05 01.0	20	eXZ	01 47.0
3	eXE	01 10.0	22	eXZ	00 01.0
4	e(S)N	13 57 23	24	eXZ	03 41.0
	eXN	58 03	24	eXZ	05 20.0
7	eXZ	13 09 00	25	eXZ	03 07.0
7	e(P)Z	14 27 28	25	eXZ	03 40.0
8	eXZ	06 24.0	25	eXZ	05 06.0
8	eXZ	07 26.0	27	eXZ	00 27.0
8	eXZ	07 52.0	29	eXZ	00 01.0
9	eXZ	10 59.0	29	eXZ	03 28.0
9	eXZ	16 02 50	30	eXZ	01 50.0
10	eXN	06 06 19			
10	eXZ	16 51.0			
11	eXN	07 40.0			
11	eXZ	12 38 03			
11	eXN	12 45 14			
12	eXZ	02 06.0			
12	eXZ	14 37.0			
16	eXZ	00 06.0			
16	eXZ	01 14.0			
16	eXZ	02 02.0			
16	eXZ	06 48.0			
16	eXZ	16 21 50			
17	eXZ	04 08.0			
17	eXZ	06 07.0			
18	eXZ	03 19.0			
18	eXZ	03 45.0			
18	eXZ	04 15.0			

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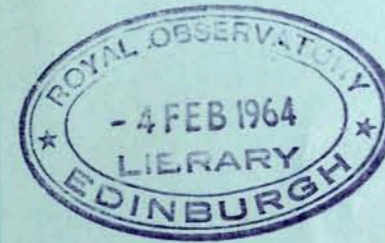
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QUETTA.

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Meteorological Service

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CONTENTS

1.	Particulars of Stations and Instruments	1
2.	Major shocks	3
3.	Local and Minor shocks	18

Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
<u>Quetta (Central Station)</u>				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Countd.)

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Major Shocks

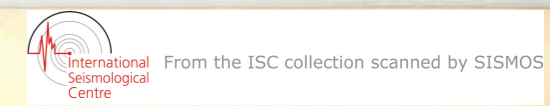
Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
c=compression, d=dilatation, X=unidentified phase.
Mu=Actual ground motion of the indicated phase in microns.
Sec=Period of the indicated phase in seconds.
(Pas), (Berk), (Up), (Ki), (Pal) stand for seismological observatories Pasadena (U.S.A.),
Berkley (U.S.A.), Uppsala (Sweden), Kiruna (Sweden) & Palisade (U.S.A.) respectively,
All times are in Greenwich Mean Time.

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
1	Qt	ePZ	00	15	17	2	Qt	ePZ	02	17	13
		USCGS H	00	02	39.2			USCGS H	02	07	14.4
		53.9 N	164.3	W				42.8 N	143.1	E	
		Unimak Island						Hokkaido, Japan			
		depth about 34 km						depth about 151 km			
1	Qt	ePZ	08	10	25	2	Qt	ePZ	05	23	24
		USCGS H	08	00	15.4			USCGS H	05	12	48.2
		29.8 N	140.5	E				5.9 S	123.5	E	
		Bonin Islands region						Banda Sea			
		depth about 181 km						depth about 25 km			
1	Qt	ePKPZ	13	30	05	2	Qt	ePZ	10	21	16
		ePPZNE	33	30				USCGS H	10	10	16.3
	Wr	ePKPN	30	12				20.7 N	142.6	E	
	Lh	ePKPZ	20					Bonin Islands			
		USCGS H	13	10	46.6			depth about 64 km			
		15.3 S	75.0	W							
		Near coast of Peru									
		depth about 146 km									
1	Qt	ePKPZ	19	08	46	3	Qt	ePKPZ	15	08	52
		USCGS H	18	50	57.5			Lh	ePKP ₂ Z	09	06
		17.9 S	178.4	W				USCGS H	14	49	30.8
		Fiji Islands						8.6 S	79.2	W	
		depth about 601 km						Near coast of Peru			
								depth about 86 km			
1	Qt	ePZ	22	03	33	3	Qt	ePZ	15	59	36
		eSN	05	31				USCGS H	15	48	16.2
		USCGS H	23	44	05.7			11.7 N	142.2	E	
		53.7 N	169.8	E				Mariana Islands region			
		Near Islands region,						depth about 65 km			
		Aleutian Islands									
		depth about 19 km									
						4	Lh	ePZ	06	21	20
								eSE	30	00	
							Qt	ePZ	22	01	0
								ePcPZE	18		

Date	Station	Phase	h	m	s
		epPZ			32
		eSNE		31	20
		Mu Sec			
		PZ 0.3		1.3	
		$\Delta = 74^\circ \cdot 3$			
		USCGS H 06 10 44.8			
		17.9 N 146.4 E			
		Mariana Islands			
		depth about 145 km			
		Mag 5.9 (Qt)			
5	Lh	ePZ	02	30	33
	Qt	ePZ		31	21
		USCGS H 02 22 02.9			
		29.2 N 129.5 E			
		Ryukyu Islands			
		depth about 97 km			
5	Lh	ePZ	05	53	32
	Wr	ePN			44
	Qt	ePZ		54	29
5	Wr	ePN	06	24	01
	Lh	ePZ			03
	Qt	ePZ		25	14
		eSNE			27 34
		H 06 22 07			
		38 N 79.5 E			
		Western Sinkiang			
		Province, China			
5	Wr	ePN	06	36	25
		eSN			37 48
	Lh	ePZ			36 38

Date	Station	Phase	h	m	s
		Qt			37 35
		ePZN			
		eSNEN*			39 58
		H 06 34 34			
		39.5 N 78.5 E			
		Western Sinkiang			
		Province, China			
		depth about 200 km			
5	Wr	ePN	07	00	14
		eSN			01 40
	Lh	ePZ			00 29
	Qt	ePZ			01 26
		eSNE			03 45
		H 06 58 29			
		39.5 N 77.5 E			
		Western Sinkiang			
		Province, China			
		depth about 150 km			
5	Qt	ePZNE	08	20	31
		eSNE			22 31
	Wr	ePN			21 24
	Lh	ePZ			52
		H 08 17 55			
		30.5 N 54.5 E			
		Central Iran			
5	Qt	ePZE	15	35	42
		eSN			37 42
5	Qt	ePZNE	18	32	31
		eSNE			34 33
6	Qt	ePZ	16	21	03
		USCGS H 16 08 20.8			
		7.0 S 13.1 W			
		Ascension Island region			
		depth about 19 km			
6	Ch	eFZ	22	22	13
		epPN*			27
		eSN*			32 54
		esSN*			33 18
	Wr	ePN			24 02
	Qt	ePZ			02
		ePKPZ			28 02
		USCGS H 22 09 31.4			
		20.0 S 169.0 E			
		New Hebrides Islands			
		depth about 47 km			
		Mag 6.5 (Pas), 6.5-6.5 (Pal)			
6	Qt	ePZ	22	39	02
7	Qt	ePZ	07	55	23
		USCGS H 07 42 22.5			
		9.4 S 155.2 E			
		D'Entrecasteaux Islands			
		region			
		depth about 174 km			
7	Qt	ePZE	08	15	46
		USCGS H 08 05 03.5			
		46.7 N 153.0 E			
		Kurile Islands			
		depth about 106 km			
7	Wr	ePN	13	23	15
		eSN			33 22
	Qt	ePZ			23 28



Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Major Shocks

Date	Station	Phase	h	m	s
		iSN*	58	00	
	USCGS H	15 34	38.5		
	20.1 S	169.8 E			
	Loyalty Islands				
	depth about	56 km			
	Mag	6-6½ (Pas)			
8	Qt	ePKPZ	22	32	10
	USCGS H	22 13	06.6		
	20.4 S	174.4 W			
	Tonga Islands region				
	depth about	25 km			
9	Qt	ePZE	08	08	15
	eSNEN*	10	10		
	eLN*	10.8			
	Wr	ePN	09	18	
	USCGS H	08 05	45.9		
	28.8 N	54.7 E			
	Iran				
	depth about	25 km			
9	Qt	ePZ	16	58	01
	USCGS H	16 46	02.0		
	51.7 N	176.2 E			
	Rat Islands				
	Aleutian Islands				
	depth about	33 km			
10	Qt	ePKPZ	04	09	18
	epPKPZ	47			
	eXZE	12	06		
	ePPZE	35			
	Lh	ePKPZ	09	26	

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Major Shocks

Date	Station	Phase	h	m	s
11	Lh	ePZ	17	25	38
	Wr	ePN	26	24	
	Qt	ePZ	59		
		e(S)NE	29	24	
	USCGS H	17 23	42.3		
	26.9 N	81.0 E			
	Northeastern India				
	depth about	25 km			
11	Qt	ePZ	18	45	58
		eXZ	47	47	
	USCGS H	18 35	54.6		
	6.7 S	125.8 E			
	Banda Sea				
	depth about	579 km			
12	Qt	ePZ	04	57	57
	USCGS H	04 47	29.0		
	3.3 N	127.9 E			
	Molucca Passage				
	depth about	92 km			
12	Lh	ePZ	13	40	02
	Wr	ePN	06		
	Qt	ePZ	42		
	USCGS H	13 29	56.6		
	45.2 N	151.0 E			
	Kurile Islands				
	depth about	40 km			
12	Qt	ePKPZ	17	39	24
	USCGS H	17 19	43.9		
	43.2 S	73.7 W			
	Off coast of Southern				
	Chile				

Date	Station	Phase	h	m	s
					depth about 60 km
13	Qt	ePZ	03	09	05
13	Qt	ePZ	09	31	30
		eSNE	33	33	
		eLN*	33.9		
	Wr	ePN	32	38	
	Lh	ePZ	53		
	USCGS H	09 28	50.0		
	26.8 N	54.3 E			
	Iran				
	depth about	60 km			
13	Lh	ePgZ	10	26	23.7
		eSgZ	30.5		
	Wr	ePN	27	17±	
	Qt	ePZ	43		
		eSNE	28	51	
		H	10	26	14
		31½ N	73½ E		
		Near Lahore			
		West Pakistan			
		Felt Lahore			
13	Qt	ePZ	10	44	47
		epPZ	59		
	USCGS H	10 31	55.6		
	5.5 S	150.8 E			
	New Britain				
	depth about	25 km			

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Major Shocks

Date	Station	Phase	h	m	s
13	Lh	ePZ	21	52	37
		epPZ			54
	Qt	ePZ		53	28
		eXZ			41
		ePPZN		55	24
		e(S)NEN*	22	00	48
		eLN*		05	1
		USCGS H	21	44	38.0
			22.8	N	122.7
				E	
					Off coast of Formosa
					depth about 100 km
14	Lh	ePZ	00	14	53 d
	Wr	ePN		15	17
	Qt	ePZ			41
		USCGS H	00	06	44.0
			14.6	N	120.9
				E	
					Luzon, Philippine Islands
					depth about 170 km
14	Wr	ePN	03	38	28
	Lh	ePZ			44
		eSZ		40	16
	Qt	ePZ		39	38
		eSE		41	56
		H	03	36	43
			39½	N	77½
				E	
					Western Sinkiang
					Province, China
					depth about 200 km
15	Lh	ePZ	00	26	13
	Wr	ePN			37

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Major Shocks

Date	Station	Phase	h	m	s
16	Qt	ePZ	04	22	37
		eSNE		24	37
16	Qt	ePZ	04	26	32
		eSNE		28	33
16	Qt	ePKPZ	07	05	59
		USCGS H	06	47	19.7
			18.6	S	175.7
				W	
					Tonga Islands
					depth about 172 km
16	Wr	iPN	09	05	24
	Lh	ePZ		06	04
		eSZ		07	06
	Qt	ePZ		06	21 d
		esPZ		07	00
		iSZNEN*			39
		Mu		Sec	
		PZ	0.5		0.7
		Δ	=6°	9	
		H	09	04	41
			36½	N	71
				E	
					Hindukush
					depth about 230 km
		USCGSH	09	04	39.4
			36.4	N	70.8
				E	
					Hindukush
					depth about 235 km
					Mag 5.7 (Qt)
16	Wr	ePN	21	19	03
	Qt	ePZ			38
		USCGS H	21	08	45.6
			49.3	N	155.1
				E	

Seismologica Bulletin of Pakistan
Volume 7 No. 7, July 1961

Major Shocks

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
17	Qt	ePZ	15	16	47	17	Qt	ePZ	13	13	
	USCGS H 14 53 28.4							esPZNE		23	
	41.2 N 72.4 E							e!PcPZ	14	15	
	Kirghiz, S. S. R.							ePPPNE	16	31	
	depth about 67 km							eSNE	20	50	
								eScSN	22	57	
								eScNE	24	40	
								e(PKPPK P)Z	43	11	
								Mu Sec			
								PZ 3.5 2.0			
								PN 1.2 2.2			
								PE 1.0 1.8			
								SN 2.7 2.5			
								SE 6.1 3.5			
								$\Delta = 55^\circ \cdot 3$			
							Kr	ePZ	14	13	2
								USCGS H 14 03 36.5			
								29.4 N 131.6 E			
								Northern Ryukyu			
								Islands			
								depth about 21 km			
								Mag $6\frac{1}{2}$ - $6\frac{3}{4}$ (Pas),			
								$6\frac{3}{4}$ -7 (Berk),			
								$6\frac{1}{2}$ (Pal), $6\frac{3}{4}$ -7 (Qt)			
						18	Lh	ePZ	14	42	40
							Wr	ePN			50
							Qt	ePZ			43 30
								UCGS H 14 34 07.3			
								29.9 N 131.2 E			
								Northern Ryukyu Islands			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
18	Lh	ePZ	15	24	59	18	Lh	ePZ	15	24	59
	Wr	ePN			25 12		Wr	ePN			31 43
	Qt	ePZ			46		Lh	ePZ			46
								USCGS H 15 16 12.5			
								29.5 N 131.3 E			
								Northern Ryukyu Islands			
								depth about 35 km			
						18	Qt	ePZ	15	46	25
								USCGS H 15 36 45.4			
								29.5 N 131.7 E			
								Northern Ryukyu Islands			
								depth about 25 km			
						18	Qt	ePZ	16	29	37
								USCGS H 16 20 08.8			
								29.5 N 131.2 E			
								Northern Ryukyu Islands			
								depth about 62 km			
						18	Qt	ePZ	16	58	11
								USCGS H 16 48 34.8			
								29.5 N 131.8 E			
								Northern Ryukyu Islands			
								depth about 60 km			
						18	Lh	ePZ	19	37	53
							Qt	ePZ			38 42
								USCGS H 19 29 04.8			
								29.3 N 131.6 E			
								Northern Ryukyu Islands			
								depth about 60 km			
						18	Qt	ePZ	21	30	50

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Date	Station	Phase	h	m	s
19	Qt	depth about 31 km ePZ	19	55	08
		USCGS H 19 45 35.0 30.3 N 131.4 E Northern Ryukyu Islands			
19	Qt	depth about 41 km ePZ	22	48	59
		epPZ 49 12 USCGS H 22 36 36.5 51.7 173.4 W Andreanof Islands Aleutian Islands			
19	Qt	depth about 42 km ePZ	23	08	25
		eLN* 17.0 USCGS H 23 00 56.7 37.7 N 20.2 E Near coast of Greece			
20	Wr	depth about 37 km ePN	00	49	59
		eSN 50 44			
	Qt	ePZ 51 05 eSNE 52 45			
		H 00 48 55 Tadzhik, S.S.R.			
20	Lh	ePZ	02	19	09
	Wr	ePN			46
	Qt	ePZ			49 d
		eXNE 25 35			
20	Wr	ePN	09	11	40

Date	Station	Phase	h	m	s
	Qt	ePZ	12	16	50
		USCGS H 09 02 31.9 28.4 N 133.6 E Northern Ryukyu Islands depth and 25 km			
20	Qt	ePZ	17	38	55
20	Qt	ePKPZ	20	17	04
		USCGS H 19 58 03.3 31.8 S 177.2 W Kermadec Islands depth about 44 km			
20	Qt	ePZ	20	31	25
		eSNE 33 23			
20	Lh	ePZ	22	58	03
	Wr	ePN			37
	Qt	ePZ			59 01
		eXZ 16 22			
		e(S)NE 23 03 38			
21	Qt	ePZ	02	55	40
		USCGS H 02 48 58.7 8.2 N 93.4 E Nicobar Islands depth about 24 km			
21	Qt	ePZ	18	08	50
		USCG H 17 59 14.4 30.0 N 131.4 E Northern Ryukyu Islands depth about 38 km			

Date	Station	Phase	h	m	s
21	Wr	ePN	18	59	53
	Qt	ePZ	19	00	27
		ePPNE 02 34 eLN* 13.6 USCGS H 18 50 50.3 29.6 N 131.6 E Northern Ryukyu Islands depth about 16 km			
21	Lh	ePZ	22	48	38
	Wr	ePN			49 00 ±
	Qt	ePZ			33
		USCGS H 22 39 53.2 29.6 N 131.6 E Northern Ryukyu Islands depth about 32 km			
22	Wr	ePN	13	54	44
	Lh	ePZ			55 27 d
	Qt	eSZE			56 28
	Qt	ePZ			55 37 c
		esPZN 56 22 eSNE 51 H 13 54 02 36 N 70 E Hindukush depth about 220 km USCGS H 13 53 45.5 36.8 N 70.3 E			

Date	Station	Phase	h	m	s
		Northeastern Afghanistan depth about 96 km			
22	Wr	ePN	20	54	48
	Lh	ePZ			55 31
		ePZ 45			
	Qt	eSN			57 47
		H 20 53 07 40 3/4 N 69 3/4 E Kisghiz, S. S. R. depth about 60 km USCGS H 20 53 30.0 39.2 N 70.0 E Kirghiz, S. S. R. depth about 222 km			
23	Wr	ePN	10	41	04
	Lh	ePZ			24
		eSE 42 04			
	Qt	ePZE 41 33 isNE 42 20			
		H 10 40 31 32 1/2 N 70 1/2 E Near Bannu West Pakistan			
23	Qt	ePKPZ	14	57	21
		esPKPZ 58			
		ePPZNE 15 00 21 USCGS H 14 38 03.5			

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Major Shocks

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		6.9 N 123.5 W					Qt	ePZ			20
		Pacific Ocean						epPZE			58
		about 2000 miles						eLN*	09	13.5	
		northwest of Galapagos					USCGS H	08 48 13.8			
		Islands					0	124.1 E			
		depth about 89 km						Northern Celebes region			
		Mag 5 $\frac{3}{4}$ -6(Pas), (Berk)						depth about 159 km			
23	Ch	iPN	22	03	45	24	Qt	ePZ	09	56	10
		epPN		04	00	24	Qt	ePZ	18	20	58
		ePPN		07	00		USCGS H	18 09 57.1			
		iSN		14	10		3.9 S	130.8 E			
		esSN			45			Ceram Island region			
		ePSN		15	10			depth about 118 km			
		ePPSN			40	25	Qt	ePKPZ	03	06	30
		eSSN		19	46		USCGS H	02 48 13.5			
	Lh	ePZ		05	05		8.8 S	71.3 W			
	Wr	ePN			21			Western Brazil			
	Qt	ePZ			32			depth about 642 km			
		epPZE			46	25	Qt	ePZ	06	10	49
		eXZN		08	50		USCGS H	05 59 39.3			
		ePPZNE		09	58		55.3 N	163.9 E			
		e!SKSNE		16	09			Near east coast of			
		ePSNE		19	23			Kamchatka			
		USCGS H 21 51 07.5						depth about 25 km			
		18.3 S 168.3 E				25	Qt	ePZ	07	39	27
		New Hebrides Islands				25	Qt	ePZ	08	12	10
		depth about 44 km					Wr	ePN			27
		Mag 7-7 $\frac{1}{4}$ (Pas)					USCGS H	08 00 56.9			
24	Lh	ePZ	08	57	42		38.2 S	78.6 E			
	Wr	ePN		58	07			Indian Ocean			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		about 900 miles north-						New Zealand			
		east of Kerguelen Islands						depth about 100 km			
		depth about 19 km				26	Qt	ePZ	15	04	09
25	Qt	ePZ	12	09	52	26	Qt	ePZ	20	47	51
	USCGS H	12 00 59.6				27	Qt	ePZ	18	42	37
	21.0 N	123.6 E					Lh	ePZ			43 30
		Off coast of Formosa						USCGS H 18 35 48.5			
		depth about 61 km						35.2 N 25.4 E			
25	Lh	ePZ	18	49	09			Aegean Sea			
		eSE		56	52			depth about 65 km			
	Wr	ePN		49	34	28	Qt	ePZ	00	06	54
	Qt	ePZ			47			USCGS H 23 59 25.6			
		epPZNE			50 00			53.2 N 111.1 E			
		ePcPZ			29			Lake Baikal region			
		eXZ			57			U.S.S.R			
		ePPZ			52 08			depth about 63 km			
		eSN			58 13	28	Qt	ePZ	00	11	21
		USCGS H 18 39 24.1						USCGS H 00 01 14.9			
		0 124.7 E						4.5 N 125.6 E			
		North Celebes						North Celebes			
		depth about 43 km						depth about 89 km			
26	Qt	ePZ	03	06	59	28	Lh	ePZ	00	42	25
	USCGS H	02 55 59.9					Wr	ePN			42
	7.5 S	128.0 E					Qt	ePZ			43 15
		Banda Sea						ePcPZE			44 25
		depth about 96 km						eSN*			50 25
26	Qt	ePKPZ	09	37	43			USCGS H 00 34 18.3			
	USCGSH	09 18 59.9						27.0 N 126.6 E			
	37.1 S	177.3 E						Ryukyu Islands			
		North Island						depth about 136 km			

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Major Shocks

Date	Station	Phase	h	m	s	
28	Qt	ePKPZ	01	24	35	
		eXZ			40	
		epPKPZ	25	16		
		ePPE	27	22		
		e(PKS)ZNE			58	
		eIXZNEN*	33	58		
	Wr	ePKPN	24	41		
	Lh	ePKPZ			45	
		USCGSH 01 05 30.0				
		2.2 S 77.1 W				
	Ecuador					
	depth about 136 km					
	Mag 6¼ (Pas) 5¾ - 6 (Berk)					
28	Ch	ePN	13	27	53	
		eSN	33	42		
	Lh	ePZ	30	10		
		ePN			38	
	Wr	ePN			38	
		ePZ			47	
	Qt	ePZ			47	
		epPZNE	31	00		
		ePPZE	32	55		
		eSN*	39	03		
eLN*		46.3				
	USCGSH 13 20 33.8					
	0.6 S 122.4 E					
	Celebes					
	depth about 35 km					
28	Lh	ePZ	15	29	24 c	
		esPZ			40	
	Qt	ePZ	30	05 c		
		epPZE			17	

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Major Shocks

Date	Station	Phase	h	m	s	
31	Qt	depth about 244 km				
		ePZ	19	19	09	
		USCGS H 19 08 41.5				
		9.7 S 117.6 E				
		Flores				
		depth about 32 km				
29	Qt	USCGS H 15 19 40.0				
		43.4 N 146.1 E				
		Kurile Islands				
		depth about 34 km				
		ePKPZ	16	46	18	
29	Qt	USCGS H 16 27 19.0				
		23.9 S 176.1 W				
		Tonga Islands region				
		depth about 23 km				
		Mag 5½ (Berk)				
30	Wr	ePN	01	55	11	
		Lh	ePZ			30
	Qt	ePZE			56 24	
		eSNE			58 47	
30	Qt	H 01 53 22				
		40 N 77¼ E				
		Western Sinkiang				
		Province, China				
		depth about 100 km				
30	Qt	ePKPZ 15 55 18				
		USCGS H 15 36 13.7				
		20.6 S 174.1 W				
		Tonga Islands				
		depth about 25 km				
31	Wr	ePN	00	24	50	
		eSN			31 54	
		Qt	ePZ			24 54
31	Qt	USCGS H 00 15 5 5.3				
		5.3 S 107.2 E				
		Off north coast of Java				

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	Quetta		6	ePZ	17 08 40
1	e(P)Z	03 14 49	7	iSNE	09 12 00
	eXZ	19 29	7	eXE	06 11 00
1	eXZ	03 26 00	7	eXZ	07 55 20
1	ePZ	13 51 35	7	ePZ	09 34 00
1	ePZ	17 41 42	7	e(S)NE	36 00 00
	eSNE	42 06	7	ePgE	21 05 00
1	ePgZ	20 57 21	7	eSgE	11 00 00
	eSgNE	36	7	ePgE	23 43 00
1	ePZ	23 00 32	7	iSgE	10 00 00
	eSNE	57	7	ePE	23 51 30
2	ePNE	20 48 37.7	8	e(S)E	52 00 00
	eSNE	51.2	8	eXE	08 08 00
2	ePZN	21 33 06	8	eXE	11 39 00
	eSNE	41	8	e(P)Z	15 52 30
3	ePZE	11 44 12	8	e(P)Z	16 04 20
	eSNE	30	8	ePgNE	20 13 10
4	ePgZ	01 28 26.7	8	eSgE	30 00 00
	eSgNE	37.0	8	eXZ	22 08 30
4	eXN	20 14 00	8	eXE	23 59 00
5	ePZ	01 23 31	9	eXE	00 06 00
5	ePN	07 32 26	9	ePgE	00 07 00
	eSN	48	9	eSgN	14 00 00
5	ePZN*	12 40 25	9	ePgZE	03 29 23
	eSNE	44	9	eSgNE	37 00 00
5	ePNE	19 08 33	9	ePE	09 32 44
	eSNE	57	10	ePZ	19 47 30
6	ePZ	15 01 52	11	eSN	45 00 00
			11	eXZ	03 29 32
			11	ePZ	10 35 17

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	eSNE	36 30	11	eSE	41 02
11	eXZ	15 05 05	18	e(P)ZE	01 31 55
11	ePZ	15 11 25	18	ePZ	07 42 45
	eSE	12 51	18	eXZ	16 29 37
11	ePZ	18 12 58	18	ePZ	23 55 31
	eSNE	14 43		eSNE	56 50
12	eXE	15 57 00	19	eXZ	04 39 00
12	ePZ	19 31 36	19	ePZ	19 03 01
	eXE	33 33		eSN	26
12	ePgZ	19 42 48	19	ePZ	20 37 08 e
	eXE	43 00		iSNE	27
12	ePZ	20 52 25	20	ePgZ	05 56 23.7
12	eXE	23 49 00		eSgNE	38.8
13	ePZ	03 58 15	20	e(P)Z	06 57 27
	eSN	59 23	20	ePZ	07 19 41
13	ePZ	09 20 40		eSNE	20 26
14	ePZ	02 48 14	21	ePZ	04 44 09
	e(S)E	49 39	21	ePZ	18 43 53 ±
15	ePZ	01 32 57	22	ePZE	03 07 14
	e(S)NE	35 20		eSNE	38
15	ePZE	17 08 40	22	ePZ	07 07 47
	eSNE	09 59		eSE	08 15
15	ePZ	19 28 33	22	ePE	18 35 04
16	ePZ	07 53 17	22	eXZE	22 39 06
	eSE	43	23	eXE	01 46 00
17	ePZ	03 38 47	23	ePZE	03 08 21
	eSE	40 38		eSE	10 20
17	ePZE	16 06 55	23	ePgE	09 11 08
	eSE	08 55		eSgE	20
17	ePZE	20 39 45	23	ePE	14 21 26

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	eSNE	22 14	28	ePZE	23 00 49
23	eXZE	22 20 47	29	eXZ	09 00 11
23	eXZ	22 31 34	29	ePgZ	11 29 21
24	ePZ	12 17 40		eSgZE	28
	e(S)NE	19 35	29	ePgE	23 16 21
25	ePgZE	06 25 55		eSgZNE	24
	eSgE	26 07	29	ePgE	23 19 01
25	ePZ	10 57 40		eSgE	04
25	ePZ	12 51 54	30	ePZ	11 30 28
	e(S)E	53 49		e(S)E	32 34
25	ePZ	14 45 28			
	e(S)NE	50			
25	ePZ	15 01 37			
	e(S)NE	02 14	1	ePN	03 25 18
25	ePZ	19 34 11	1	ePN	11 34 22
	e(S)NE	50		eSN	48
26	ePZ	07 48 12	1	ePN	17 28 48
	eSNE	49 29	2	ePN	16 48 12
26	ePZ	16 37 23	2	ePN	20 30 21
	e(S)NE	40		eSN	31 04
26	ePgZ	21 54 11.3	5	ePN	01 50 35
	eSgE	13.6		eSN	51 10
27	ePZ	00 51 00	5	ePgN	10 37 36
	e(S)NE	52 32		eSgN	38
27	e(P)Z	15 43 50	5	ePN	14 23 35
28	e(P)Z	05 52 19	6	ePN	09 48 30
28	ePgE	20 09 01.6	6	ePN	11 19 57
	eSgE	10.3	6	ePN	17 09 06
28	ePZ	20 34 07	8	ePN	11 37 02
	eSNE	29		eSN	32
			10	ePN	22 26 07

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
11	ePN	10 34 07	22	ePN	11 28 16
	eSN	34	23	ePN	14 55 06
11	ePN	15 10 20	23	ePN	16 33 51
	eSN	57	23	ePN	17 31 55
11	ePN	18 11 49		eSN	32 26
	eSN	12 34	26	ePN	01 47 04
12	ePN	08 53 11		eSN	48
	eSN	45	26	ePN	04 56 03
12	ePN	13 03 45		eSN	40
13	ePN	03 58 33	26	ePN	07 47 13
13	ePN	09 32 38		eSN	44
13	ePN	21 52 58	27	ePN	08 42 21
14	ePN	01 47 26	27	ePN	15 38 08
14	ePN	02 47 29	30	ePZ	11 10 21
14	ePN	20 29 50		iSZ	58
15	ePN	01 31 49	31	ePN	17 42 10
15	ePN	17 07 37	31	ePN	23 51 27
	eSN	08 05			
15	ePgN	19 41 07			
	eSgN	10 19			
16	ePN	13 52 23	1	eXZ	03 27 59
	eSN	58	5	ePZ	05 26 08
17	ePN	03 37 49	5	eXZ	21 00 41
17	ePN	20 38 50	6	eXZ	10 21 38
	eSN	39 23	6	eXZ	13 05 33
18	ePN	01 33 51	9	ePZ	08 10 02
19	ePN	06 42 01		iSE	13 23
20	ePN	06 57 06	11	ePZ	18 12 11
20	ePN	12 18 26	14	eXZ	02 50 04
21	ePN	12 31 55	16	ePZ	21 19 05
			28	eXZ	00 06 10

Seismological Bulletin of Pakistan
Volume 7 No. 7, July 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
30	ePZ	02 21 11			
	eSE	37			
Karachi					
11	eXE	09 39 46			
23	eXE	22 19 26			
Chittagong					
5	eXZ	20 27 46			
7	eXN*	04 59 0			
7	e(Pg)Z	17 04 08			
	eSZN*	40			
9	eXZ	23 47 0			
14	ePZN*	07 40 09			
	eSN*	21			
14	ePN*	13 17 42			
	eSN*	54			
15	eXN*	00 31 33			
15	e(P)N*	14 00 00			
23	ePN	15 42 55			
	eSN	53 20			
24	eXN	08 55 52			

Bull. of Pakistan,
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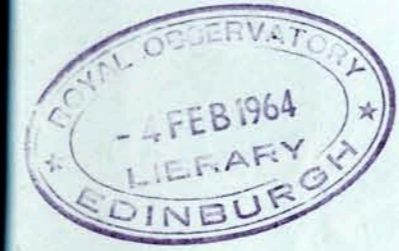
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Vol. 7 August 1961 No. 8

CONTENTS

1.	Particulars of Stations and Instruments ...	1
2.	Major shocks ...	3
3.	Local and Minor shocks ...	16

Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Quetta (Central Station)				
Sprengnether	Z	1.9 sec.	Critical	5,500
"	N	1.95 "	"	4,500
"	E	1.95 "	"	5,800
"	N	15.8 "	"	15,000
"	E	16.5 "	"	16,000

(Countd.)

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki), (Pal) stand for seismological observatories Pasadena (U.S.A.),
 Berkley (U.S.A.), Uppsala (Sweden), Kiruna (Sweden) & Palisade (U.S.A.) respectively,
 All times are in Greenwich Mean Time.

Seismological Bulletin of Pakistan
Volume 7 No. 8, August 1961

				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
1	Qt	ePZ	05 27 58			Kurile Islands	
1	Qt	ePZ	05 53 24			depth about 74 km	
		eXZ	32	3	Qt	ePZ	00 46 16
		eSKSEN*	06 04 03			eLN*	50 10
		USCGS H 05 39 53.2			Wr	ePN	47 13
		9.8 S 160.5 E				USCGS H 00 41 35.7	
		Solomon Islands region				14.3 N 52.2 E	
		depth about 50 km				Gulf of Aden	
		Mag 6 1/2 - 6 3/4 (Pas),				depth about 75 km	
		6 1/2 (Berk)		3	Wr	ePN	07 02 44
1	Qt	ePKPZ	07 39 55		Qt	ePZ	56
		USCGS H 07 21 12.3				eXN*	12 20
		56.8 S 25.1 W				eSSN*	16 38
		Sandwich Islands region				USCGS H 06 41 44.1	
		depth about 61 km				3.5 S 130.8 E	
1	Qt	ePKPZ	09 53 22			Ceram	
		USCGS H 09 34 40.7				depth about 22 km	
		57.1 S 26.1 W		3	Lh	ePZ	23 44 28
		Sandwich Islands				eSE	53 20
		depth about 31 km			Wr	ePN	44 45
2	Qt	ePKPZ	01 37 04		Qt	ePZ	45 07
		USCGS H 01 17 08.1				eSN*	54 31
		53.3 S 134.9 W				USCGS H 23 33 37.7	
		South Pacific Ocean				12.1 N 143.8 E	
		depth about 22 km				Mariana Islands region	
2	Lh	eXZ	12 21 49			depth about 20 km	
	Qt	ePZ	22 35	4	Qt	ePZ	01 27 18
		epPZ	52			eSN	28 38
		USCGS H 12 12 03.8			Lh	eXZ	27 35
		44.5 N 148.7 E				eSE	28 53

Seismological Bulletin of Pakistan
Volume 7 No. 8, August 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Wr	ePN	27	48			Burma				
		H 01 25 27					depth about 50 km				
		Eastern Iran				6	Qt	eXZ	10	45	37
4	Wr	ePN	1	55	16		USCGS H	10 34 33.4			
	Qt	ePZ			42		2.7 S	122.0 E			
4	Lh	ePZ	23	02	55		Celebes				
		eSE			11 01		depth about 69 km				
	Wr	ePN			02 59	7	Wr	ePN	03	33	47
	Qt	ePZ			03 35 d		eSN				34 33
		epPE			53		Qt	ePZ			51
		eSNEN*			12 19		eSNE				36 10
		Mu Sec					H 03 33 07				
	PZ	0.4	1.6				Hindukush				
		$\Delta = 65^\circ 4$				7	Qt	ePZ	04	12	18
		USCGS H	22 52 49.2				epPZ				24
		45.3 N	151.1 E				USCGS H	04 02 09.4			
		Kurile Islands					42.2 N	142.1 E			
		depth about 20 km					Hokkaido, Japan				
5	Qt	ePZ	03	38	51		depth about 24 km				
5	Wr	ePN	08	57	52	7	Lh	ePZ	04	32	05
		eSN			58 42		Wr	ePN			34
	Qt	ePZ			59 00		Qt	ePZ			39
		eSNE			09 00 42		eSN*				41 08
5	Qt	ePZ	09	47	02		USCGS H	04 22 20.5			
5	Wr	ePN	19	05	42		2.7 S	121.6 E			
	Qt	ePZ			58		Celebes				
		epPZ			06 03		depth about 18 km				
		eSZN			10 28	7	Qt	ePZ	10	53	37
		USCGS H	19 00 20.1				USCGS H	10 43 20.9			
		21.7 N	93.9 E				0.3 N	124.0 E			

Seismological Bulletin of Pakistan
Volume 7 No. 8, August 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Celebes						Mu Sec			
		depth about 76 km						PZ	0.3	1.3	
7	Qt	ePKPZ	17	16	47			$\Delta = 83^\circ 8$			
		USCGS H	16 57 50					USCGS H	12 18 19		
		27.5 S	177.1 W					50.9 N	170.7 W		
		Kermadec Islands region						Fox Islands			
		depth about 60 km						Aleutian Islands			
7	Qt	ePnZ	22	22	32.6			depth about 24 km			
		ePgZE			34.7			Mag 6-6.4 (Pas), 5-5.4			
		iSnNN*			50.7			(Berk) 5.4-6 (Pal), 6.4 (Qt)			
		H 22 22 07.1				8	Qt	ePZ			13 02 01
		$\Delta = 1^\circ 3$				8	Qt	ePZ			13 50 24
		Baluchistan						USCGS H	13 37 53.0		
		West Pakistan						51.3 N	170.5 W		
8	Qt	ePZ	05	48	41			Fox Islands			
		USCGS H	05 36 28.9					Aleutian Islands			
		51.9 N	176.3 W					depth about 39 km			
		Andreanof Islands				8	Wr	ePN	18	54	01
		Aleutian Islands					Lh	ePZ			01
		depth about 57 km						eSEN			31
8	Ch	ePN	12	29	57		Qt	ePZ			55 09
		eSN			39 30			eSE			56 31
	Wr	ePN			30 26			$\Delta = 7^\circ 4$			
	Lh	ePZ			30 d			H 18 53 20			
		eSNE			40 30			34.0 N	74.5 E		
	Qt	ePZ			30 55 d			Kashmir			
		eXN			31 28			USCGS H	18 53 15.7		
		ePPZNE			34 09			34.1 N	74.6 E		
		eSZNEN*			41 18			Northern India			
		ePSN*			42 09			depth about 23 km			

Seismological Bulletin of Pakistan
Volume 7 No. 8, August 1961

Major Shocks

Date	Station	Phase	h	m	s
9	Qt	ePZ	04	12	39
		eXZ			51
		USCGS H	04	02	30.8
		40.6 N	142.8 E		
		Near coast of northern Honshu, Japan			
		depth about 112 km			
9	Qt	ePZ	16	16	58
		eXZ			20 27
		ePKPZ			21 03
		ePPE			22
		USCGS H	16	02	36.1
		19.1 S	168.7 E		
		New Hebrides Islands region			
		depth about 69 km			
		Mag 5½ (Berk)			
10	Wr	ePN	12	12	28
	Qt	ePZ			13 13
		USCGS H	12	03	21.8
		37.2 N	136.9 E		
		Near west coast of Honshu, Japan			
10	Qt	ePZ	12	15	41
		eSN			23 58
		USCGS H	12	05	21.4
		43.3 N	144.9 E		
		Northern Hokkaido Japan			
		depth about 25 km			

Seismological Bulletin of Pakistan
Volume 7 No. 8, August 1961

Major Shocks

Date	Station	Phase	h	m	s
		eSN	09	02	
	Qt	iPZ	01	52	c
		ipPZ	02	07	
		ePcPE			34
		ePPN	04	03	
		epPPZ			21
		iSNEN*	10	12	
		esSE			40
		ePKPPKP	31	03	
		Mu	Sec		
		PZ	8.9	2.0	
		$\Delta = 6z^{\circ} \cdot 2$			
		USCGS H	15	51	35.4
		42.9 N	145.1 E		
		Eastern Hokkaido Japan			
		depth about 71 km			
		Mag 7 (Pas) (Berk),			
		7½ (Qt)			
11	Ch	ePN	22	44	44
		eSN			50 36
	Lh	ePZ			47 08
	Wr	ePN			33
	Qt	ePZ			42 c
		ePPZ			50 04
		eSN*			55 59
		USCGS H	22	37	22.0
		2.8 S	122.1 E		
		Eastern Celebes			
		depth about 20 km			

Date	Station	Phase	h	m	s
		depth about 25 km			
13	Wr	ePN	10	27	14
		eSN			47
	Qt	ePZ	23	02	
		esPN	29	00	
		eSN			12
		$\Delta = 6^\circ \cdot 1$			
		H 10 26 32			
		Hindukush region			
		depth about 200 km			
14	Qt	ePKPZ	19	09	52
		USCGS H 18 50 50.3			
		24.2 S 175.7 W			
		Tonga Islands region			
		depth about 21 km			
		Mag $5\frac{1}{2}$ (Berk)			
14	Qt	ePZ	19	53	52
14	Wr	ePN	22	13	56
	Qt	ePZ	14	30	c
		USCGS H 22 04 59.0			
		31.8 N 131.2 E			
		Off south coast of			
		Kyushu, Japan			
		depth about 14 km			
14	Qt	ePZ	23	43	15
		eXZ			46 46
		ePKPZ			47 10
		eSKKSN*			54 21
		USCGS H 23 28 46.5			
		20.3 S 169.4 E			

Date	Station	Phase	h	m	s
		depth about 305 km			
17	Wr	ePN	03	36	19
		eSN			50
	Lh	ePZ			37 05
		eSE			38 11
	Qt	ePZ			37 10
		esPZNE			46
		iSNE			38 21
		H 03 35 38			
		36 N 69.5 E			
		Hindukush			
		depth about 150 km			
		USCGS H 03 35 38.9			
		35.9 N 69.7 E			
		Hindukush			
		depth about 181 km			
17	Ch	iPN	21	25	25
		eSN			32 39
	Lh	ePZ			26 11 d
	Wr	ePN			12
	Qt	iPZ			26 49 d
		iPcPZE			27 09
		epPE			19
		eXZN			28 38
		eXN			34 49
		eSN			35 09
		isSN*			36 30
		iXN*			37 36
		ePKPPKP			55 36
		Mu Sec			
		PZ 3.8 1.7			
		Qt ePZ 24 57 c			
		eSN 26 16			
		$\Delta = 7^\circ \cdot 2$			
		H 12 23 14			
		36.3 N 71.3 E			
		Hindukush			
		depth about 250 km			
		USCGS H 12 23 13.6			
		36.3 N 71.4 E			
		Hindukush			
		depth about 256 km			
16	Lh	ePZ	16	02	23
	Qt	ePZ			03 06 d
		USCGS H 15 53 38.6			
		33.6 N 137.2 E			
		Off south coast of			
		Honshu, Japan			
		depth about 325 km			
16	Qt	ePZ	16	28	57
		eSN*			39 54
		USCGS H 16 15 57.5			
		13.8 S 14.7 W			
		South of Ascension			
		Island			
		depth about 25 km			
16	Wr	ePN	22	31	32
	Qt	ePZ			52
		USCGS H 22 22 32.7			
		11.0 N 124.8 E			
		Philippine Islands			

Major Shocks

Date	Station	Phase	h	m	s
	Kr	$\Delta = 64^{\circ} \cdot 2$ iPZ	21	27	41 d
		USCGS H	21	16	30
		46.3 N 149.3 E			
		Kurile Islands			
		depth about 186 km			
		Mag $6\frac{3}{4}$ (Pas),			
		$6\frac{1}{2}$ - $6\frac{3}{4}$ (Berk), 7 (Qt)			
19	Lh	ePZ	02	52	35
	Qt	ePZ		53	18 c
		USCGS H	02	42	58.2
		43.1 N 145.0 E			
		Eastern Hokkaido			
		Japan			
		depth about 32 km			
19	Qt	ePZ	05	27	51
19	Qt	ePKPZ	05	28	06 d
		epPKPZNE		30	42
		iPKSEN*		31	42
		eXZ		38	02
	Lh	ePKPZ		28	10
	Kr	ePKPZ			22
		epPKPE		30	56
	Ch	iPKPN		28	45
		epPKPN		31	07
		USCGS H	05	09	49.5
		10.7 S 71.0 W			
		Peru-Brazil border			
		depth about 649 km			
		Mag 7 (Pas), $7\frac{3}{4}$ -8 (Berk)			

Major Shocks

Date	Station	Phase	h	m	s
		ePKKPZ		32	19
		USCGS H	05	04	14.3
		17.8 S 178.8 W			
		Fiji Islands			
		depth about 592 km			
21	Wr	ePN	07	00	59
	Lh	ePZ		01	40 c
		esPZ		02	11
		eSZ			35
	Qt	ePZ			05 c
		esPZ			33
		iSNE		03	22
		H	07	00	26
		36 N 71.5 E			
		Hindukush region			
		depth about 130 km			
		USCGS H	07	00	21.2
		36.3 N 71.5 E			
		Hindukush			
		depth about 152 km			
21	Wr	ePKPN	16	25	45
	Qt	ePKPZ			49
		USCGS H	16	06	55.4
		17.8 S 174.4 W			
		Tonga Islands			
		depth about 74 km			
		Mag $5\frac{3}{4}$ -6 (Berk)			
21	Wr	ePN	17	09	54
	Qt	ePZ		10	31 c
		epPZ			38

Seismological Bulletin of Pakistan
Volume 7 No. 8, August 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
24	Qt	depth about 25 km ePZ	05	02	41			18°0 N 146°4 E Mariana Islands			
		USCGS H 04 52 20				26	Qt	depth about 53 km ePZ	23	02	27
		42.9 N 145.3 E						eXN*	04	53	
		Eastern Hokkaido				27	Qt	ePZ	02	04	50 d
		Japan						eSN*	15	49	
24	Qt	depth about 44 km ePZ	10	01	12			USCGS H 01 51 51.8			
24	Qt	ePZ	22	51	12			15.3 S 13.1 W			
		USCGS H 22 40 49.1						South of Ascension Island			
		43.0 N 145.0 E						depth about 49 km			
		Eastern Hokkaido				27	Qt	ePZ	04	12	40
		Japan				27	Ch	ePN	16	31	45
		depth about 18 km						epPN			57
25	Qt	ePZ	07	12	16			ePPN	33	47	
		ePPZNE	15	36				eSN	39	22	
		USCGS H 06 59 30.2					Wr	ePN	32	28	
		53.5 N 161.2 W						eSN	40	43	
		Alaska Peninsula					Qt	ePZ	33	02 c	
		depth about 36 km						ePcPZ			37
25	Qt	ePZ	08	00	53			eSNE	41	55	
25	Wr	ePN	21	36	50			Mu Sec			
	Qt	ePZ			59			PZ 1.3 2.2			
		USCGS H 21 26 28.1						$\Delta = 67^\circ.4$			
		8.1 S 122.8 E						USCGS H 16 22 08.1			
		Flores Sea						46.6 N 154.1 E			
		depth about 191 km						Kurile Islands			
26	Qt	ePZ	19	01	12			depth about 31 km			
		eScSN*	11	23				Mag $6\frac{1}{2}$ (Pas),			
		USCGS H 18 49 47.1						$5\frac{1}{4}$ - $5\frac{1}{2}$ (Berk), $5\frac{1}{4}$ (Pal),			
								6.8 (Qt)			

Seismological Bulletin of Pakistan
Volume 7 No. 8, August 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
27	Ch	ePN	16	56	52	27	Qt	ePZ	22	15	52 c
		eSN	17	04	15			eSNE			21 33
	Wr	ePN	16	58	45		Wr	ePN			16 13
		eSN	17	07	41			eSN			22 07
	Qt	ePZ	16	59	12		Ch	ePN			18 06
		eSNE	17	08	29			USCGS H 22 08 49.8			
		USCGS H 16 47 44.8						35.9 N 23.7 E			
		18.3 N 146.6 E						Near west coast of			
		Mariana Islands						Crete			
		depth about 27 km						depth about 69 km			
		Mag $6\frac{1}{4}$ - $6\frac{1}{2}$ (Pas), $5\frac{1}{2}$ (Berk)				28	Qt	ePZ	00	20	31
27	Ch	ePN	17	09	51	28	Qt	ePKPZ	06	47	30
		epPN			45			USCGS H 06 28 19.4			
		eSN			42			15.1 S 70.2 W			
	Qt	ePZ			41 d			Peru-Bolivia border			
		USCGS H 17 02 27.2						depth about 185 km			
		2.2 N 128.6 E				28	Qt	ePZ	06	50	48
		Halmahera				28	Qt	ePKPZ	10	02	06
		depth about 263 km						USCGS H 09 44 13.5			
27	Qt	ePZ	20	01	37			18.6 S 178.0 W			
		USCGS H 19 50 47.2						Fiji Islands			
		47.3 N 154.0 E						depth about 574 km			
		Kurile Islands				28	Qt	ePZ	12	24	41
		depth about 45 km						USCGS H 12 13 45.3			
27	Wr	ePN	21	06	24			46.7 N 153.9 E			
	Qt	ePZ			07 10 c			Kurile Islands			
		USCGS H 20 56 15.6						depth about 19 km			
		46.8 N 153.9 E				28	Qt	ePZ	18	12	50 c
		Kurile Islands						USCGS H 18 01 56.6			
		depth about 25 km						46.8 N 154.0 E			

Seismological Bulletin of Pakistan
Volume 7 No. 8, August 1961

Major Shocks

Date	Station	Phase	h	m	s
		Kurile Islands			
		depth about 32 km			
28	Wr	ePKPN	20	46	06
	Qt	ePKPZ			10
		ePPZ			51 25
		USCGS H 20 26 04.2			
		22.9 S 113.4 W			
		Easter Island region			
		depth about 56 km			
28	Wr	ePKPN	21	46	36
	Qt	ePKPZ			38
		ePPZ			49 37
		USCGS H 21 27 12.1			
		14.0 S 74.4 W			
		Near coast of Peru			
		depth about 73 km			
29	Qt	ePZ	06	05	56
		USCGS H 05 55 33.0			
		42.7 N 145.0 E			
		Kurile Islands			
		depth about 25 km			
29	Qt	ePZ	07	58	54
		eLN*			08 01 10
29	Lh	ePZ	15	03	16
	Qt	ePZ			42
		eSNEN*			14 03
		USCGS H 14 51 14.2			
		52.2 N 170.8 W			
		Fox Islands			
		Aleutian Islands			

Seismological Bulletin of Pakistan
Volume 7 No. 8, August 1961

Major Shocks

Date	Station	Phase	h	m	s
31	Qt	ePKPZ	00	41	46
		USCGS H 00 22 47.3			
		28.1 S 176.7 W			
		Kermadec Islands			
		depth about 56 km			
31	Qt	eXZ	02	06	42
		(Small early reading)			
		ePKPZ			56
		epPKPZ			09 32
		e(PKS)E			10 29
		eXNE			12 43
	Kr	iPKPZ			06 57
		epPKPZ			09 34
	Wr	eXN			06 50
	Lh	eXZ			07 00
	Ch	ePKPN*			34
		epPKPN*			10 12
		ePKSN*			11 11
		USCGS H 01 48 37.5			
		10.6 S 70.9 W			
		Peru-Brazil border			
		depth about 626 km			
		Mag 7-7½ (Pas), 6½ (Berk)			
31	Qt	eXN	02	15	17
		(Small early reading)			
		ePKPZ			25
		epPKPE			18 05
		ePKSE			19 06
	Kr	ePKPZ			15 28
		epPKPZ			18 07

Seismological Bulletin of Pakistan
Volume 7 No. 8, August 1961

Minor Shocks

Date	Phase	h m s
	Quette	
1	eXZ	06 28.0
1	ePE	20 19 12
	eSE	20 29
1	ePE	21 50 11
	eSE	52 05
1	ePE	22 47 07
	eSE	48 24
1	ePE	23 40 04
	eSE	41 24
2	eXE	01 15.0
2	ePE	06 04 38
	eSE	05 54
2	ePgE	20 59 26.1
	eSgE	27.9
2	ePE	22 40 24
	eSE	49
3	ePZ	16 05 18
4	eXZ	07 17 58
4	ePZ	19 39 06
4	ePZ	21 55 42
5	ePgZ	00 56 08.6 c
	iSgNE	20.9
6	ePZ	01 02 18
	e(S)E	48
6	ePZ	06 31 08±
	eSNE	31
6	ePZ	06 37 05
	e(S)E	39 03

Seismological Bulletin of Pakistan
Volume 7 No. 8, August 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	eSgN	31		eXE	03 26
10	ePZ	02 52 26±	13	ePZ	19 29 39±
	eSNE	47	13	ePZ	23 07 49±
10	ePZ	02 53 15	13	ePgZ	23 27 27.8
	eSN	36		eSgE	30.7
10	ePgN	11 07 57.1	14	ePgZ	03 20 33.0
	iSgNE	59.1		eSgZ	37.5
10	e(P)Z	19 54 10	14	ePgZ	08 43 11.1
	eXZ	27		eSgZN	14.5
10	ePZ	20 25 43±	14	ePZ	11 26 20.7
	eXZ	26 00		eSN	43.3
10	ePgZ	23 34 46 d	14	ePZ	23 58 15
	iSgNE	56		eXZ	26
11	ePZ	10 01 21	15	ePZ	04 56 49
11	ePZ	10 09 52		eXZ	56
	eSNE	10 19	15	ePgZ	10 02 42.3
11	ePZ	18 43 53±		eSgNE	45.0
	eXZ	44 00	15	ePZ	13 29 51 d
11	ePgZN	23 09 51.7		eSNE	31 00
	iSgNE	54.9	15	ePZ	15 01 04 d
12	ePZ	04 19 01		eXE	31
	e(S)N	44	15	ePZ	15 52 39
12	ePE	14 15 09±		e(S)E	53 06
	eSE	16 35	15	ePgZE	18 02 46.1
12	ePE	14 20 10		eSgNE	52.5
	eSE	57	16	ePZ	18 42 13
12	ePE	22 16 06		eSN	30
	e(S)N	18 31	17	e(P)Z	05 25 59
12	eXZ	23 10 26	17	ePE	13 50 36
13	ePZ	04 02 50		eSE	52 05

Seismological Bulletin of Pakistan
Volume 7 No. 8, August 1961

Date	Phase	h m s	Date	Phase	h m s
17	ePgZ	16 59 42.3	22	eSgNE	05 08
	eSgNE	58.0	22	eXZ	09 42 39
17	ePZ	19 22 01	22	ePZ	11 20 12
	e(S)NE	27	22	ePZE	13 33 31
17	ePZ	21 55 36±		eSNE	50
	eXNE	41	22	ePZ	23 38 28
17	ePgZ	22 28 24		eXNE	39 52
	eSgE	37	23	eXE	07 15 30
18	ePZ	07 59 07	23	ePZ	15 31 56
	eSNE	08 00 50		eSNE	33 14
18	ePZ	14 49 14	23	ePgZ	16 52 47
	eSE	50		eSgNE	59
19	ePZ	16 36 45	23	ePgZE	20 56 36.8
20	ePgE	11 51 38		eSgE	38.9
	eSgE	54	24	ePZ	00 53 32
20	ePZ	12 15 41		eXZ	45
	eSN	58	24	ePZ	01 03 54
20	ePZ	18 04 45		eXZ	04 01
20	ePZE	19 15 37	24	ePgZ	02 50 45
	eSE	17 24		eXZ	48
20	ePZE	20 00 27	24	eXZ	13 29.0
20	ePgZ	21 35 24	25	ePE	18 12 18.4
	e(Sg)E	35	25	ePE	19 58 54
21	ePE	14 06 10	25	eXE	20 13.3
	eSNE	07 27	25	ePZ	21 08 29±
21	e(P)Z	17 29 59		eXZ	37
	eXZ	30 15	25	eXE	23 13 10
21	ePZ	19 10 54		eXE	32
	eSE	12 16	25	ePZ	23 52 57
22	ePgZ	02 04 55	26	ePZ	13 02 11

Seismological Bulletin of Pakistan
Volume 7 No. 8, August 1961

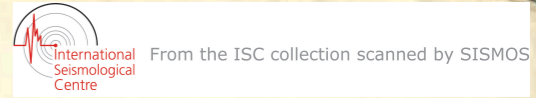
Date	Phase	h m s	Date	Phase	h m s
	eXZ	17	30	ePZ	11 20 13
26	ePZ	13 07 33		eSNE	46
	eXZ	37	30	e(P)Z	11 58 05
26	ePZ	15 58 25		e(S)NE	12 00 29
	e(S)E	59 07	30	eXE	17 40.5
27	ePZ	03 54 34	30	ePE	18 37 15
	eXZ	40	30	ePE	21 52 42
27	ePZ	04 01 46	30	ePE	22 23 17
	eXN	02 21	30	ePE	22 41 20
28	ePZ	00 24 12	30	ePE	22 55 45
	eXZ	40	30	ePE	23 10 30
28	ePgZ	01 37 10.2	31	ePE	00 07 24
	eSgN	25.6	31	ePgE	00 13 24.7
28	ePgZ	02 41 10.8		iSgNE	40.4
	eSgNE	13.1	31	eXE	00 27.0
28	ePN	10 08 04	31	iPgN	09 07 37.2
	eSNE	22		iSgN	38.6
28	ePZ	15 26 42	31	ePgE	16 05 38.4
	eSNE	27 03		eSgE	50.5
28	ePZ	20 14 14	31	eXE	18 03.0
28	ePZ	23 10 09	31	ePgE	19 33 34.6
29	ePgZ	03 45 20.3		eSgE	37.0
	eSgNE	31.5	31	ePgE	20 04 52.2
29	ePgZ	12 07 14.0		eSgE	54.3
	iSgNE	15.9	31	ePgE	20 59 12.7
29	eXZ	13 31.0		eSgE	13.8
	eSE	36.3	31	ePgZ	21 21 36.1
29	eXE	13 41.3		eSgE	48.0
	e(S)ZNE	42 59	31	ePZE	22 22 05
29	eXZE	22 56.0		eSN	23 24

Date	Phase	h m s
31	ePgE	22 40 46.6
	eSgE	48.0
31	ePgZE	23 13 00.0
	eSgE	10.4
31	ePgE	23 46 25.7
	eSgE	29.6
Warsak		
1	ePN	06 51 08
1	ePN	07 07 21
1	ePN	20 18 21
	eSN	52
1	ePN	22 46 24
1	ePN	23 39 12
	eSN	41
2	ePN	06 03 36
	eSN	04 03
2	ePN	12 04 28
	eSN	05 05
2	ePN	23 00 05
3	ePN	20 10 11
3	ePN	22 08 30
4	ePN	09 35 54
5	ePN	08 57 52
	eSN	58 42
5	ePN	20 36 50
5	ePN	21 18 50
6	ePN	01 22 10
6	ePN	18 42 06
6	ePN	21 25 02

Date	Phase	h m s
6	ePN	21 43 06
7	ePN	02 11 40
7	ePN	03 33 47
	eSN	34 33
7	ePN	17 56 15
7	ePN	22 24 00
8	ePN	10 49 00
8	ePN	11 26 22
8	ePN	12 30 26
8	ePN	13 20 56
8	ePN	16 18 46
9	ePN	03 14 25
	eSN	53
9	ePN	08 03 49
	eSN	04 18
9	ePN	08 33 06
	eSN	31
9	ePN	18 34 33
13	ePN	00 03 29
13	ePN	18 41 00
	eSN	28
14	ePN	09 09 06
14	ePN	16 32 05
14	ePN	22 31 59
	eSN	32 35
15	ePN	13 29 00
15	ePN	15 01 37
16	ePN	22 42 41
	eSN	43 10
17	ePN	07 48 16

Date	Phase	h m s
	eSN	50
17	ePN	13 49 31
	eSN	50 00
18	ePN	07 57 58
	eSN	58 48
19	ePN	16 35 55
21	ePN	14 05 06
	eSN	34
21	ePN	19 10 09
23	ePN	15 30 53
	eSN	31 20
25	ePN	18 05 03
26	ePN	15 56 35
27	ePN	05 44 02
	iSN	41
28	ePN	23 48 31
	eSN	49 10
29	ePZ	10 00 26
30	ePZ	01 47 06
	iSZ	41
30	iPZ	05 24 50
	iSZ	25 18
30	ePZ	11 56 50
30	ePgZ	14 52 13
	eSgZ	28
30	iPZ	18 34 53
	iSZ	35 23
30	ePZ	23 26 10
	eSZ	33
31	iPZ	13 17 33
	iSZ	18 17

Date	Phase	h m s
31	iPZ	22 21 06
	iSZ	40
Lahore		
4	eXZ	21 54 43
9	ePZ	18 32 54
	eXN	33 40
9	ePZ	19 20 20
	eSN	21 16
16	ePZ	22 01 09
19	ePZ	07 05 07
25	ePZ	20 00 02
30	e(P)N	11 57 06
	e(S)N	58 38
Karachi		
9	ePgZ	13 03 48
	iSgE	53
13	eXE	04 02 33
	iSE	03 07
Chittagong		
3	eXN	23 58.0
4	eXN	20 51.0
4	eXN	21 15.0
7	eXN	22 35.0
22	eXN	02 43.0
22	e(P)N	13 42 00
	iSN	38
22	eXN	11 49 52



Seismological Bulletin of Pakistan
Volume 7 No. 8, August 1961

Seismological Bulletin of Pakistan
Volume 7 No. 8, August 1961
Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
25 08 22 22 21 08	ePgN	06	34	35	25 08 22 21 08	ePgN	06	34	35
	eSgN			48		eSgN			48
28 08 23 18 22 01	e(P)N	00	17	03	28 08 23 18 22 01	e(P)N	00	17	03
	eXN			54		eXN			54
28 08 24 18 21 18 22 01	ePN	17	18	30	28 08 24 18 21 18 22 01	ePN	17	18	30
	e(S)N			49		e(S)N			49
30 08 25 10 20 20 01	eXN	00	30	10	30 08 25 10 20 20 01	eXN	00	30	10
	iXN	09	21	36		iXN	09	21	36
30 08 26 10 20 20 01					30 08 26 10 20 20 01				
30 08 27 10 20 20 01					30 08 27 10 20 20 01				
30 08 28 10 20 20 01					30 08 28 10 20 20 01				
30 08 29 10 20 20 01					30 08 29 10 20 20 01				
30 08 30 10 20 20 01					30 08 30 10 20 20 01				
30 08 31 10 20 20 01					30 08 31 10 20 20 01				
30 08 32 10 20 20 01					30 08 32 10 20 20 01				
30 08 33 10 20 20 01					30 08 33 10 20 20 01				
30 08 34 10 20 20 01					30 08 34 10 20 20 01				
30 08 35 10 20 20 01					30 08 35 10 20 20 01				
30 08 36 10 20 20 01					30 08 36 10 20 20 01				
30 08 37 10 20 20 01					30 08 37 10 20 20 01				
30 08 38 10 20 20 01					30 08 38 10 20 20 01				
30 08 39 10 20 20 01					30 08 39 10 20 20 01				
30 08 40 10 20 20 01					30 08 40 10 20 20 01				
30 08 41 10 20 20 01					30 08 41 10 20 20 01				
30 08 42 10 20 20 01					30 08 42 10 20 20 01				
30 08 43 10 20 20 01					30 08 43 10 20 20 01				
30 08 44 10 20 20 01					30 08 44 10 20 20 01				
30 08 45 10 20 20 01					30 08 45 10 20 20 01				
30 08 46 10 20 20 01					30 08 46 10 20 20 01				
30 08 47 10 20 20 01					30 08 47 10 20 20 01				
30 08 48 10 20 20 01					30 08 48 10 20 20 01				
30 08 49 10 20 20 01					30 08 49 10 20 20 01				
30 08 50 10 20 20 01					30 08 50 10 20 20 01				
30 08 51 10 20 20 01					30 08 51 10 20 20 01				
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30 08 55 10 20 20 01					30 08 55 10 20 20 01				
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30 08 59 10 20 20 01					30 08 59 10 20 20 01				
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30 08 61 10 20 20 01					30 08 61 10 20 20 01				
30 08 62 10 20 20 01					30 08 62 10 20 20 01				
30 08 63 10 20 20 01					30 08 63 10 20 20 01				
30 08 64 10 20 20 01					30 08 64 10 20 20 01				
30 08 65 10 20 20 01					30 08 65 10 20 20 01				
30 08 66 10 20 20 01					30 08 66 10 20 20 01				
30 08 67 10 20 20 01					30 08 67 10 20 20 01				
30 08 68 10 20 20 01					30 08 68 10 20 20 01				
30 08 69 10 20 20 01					30 08 69 10 20 20 01				
30 08 70 10 20 20 01					30 08 70 10 20 20 01				

Nos 3-4
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10 2-64

Vol. of Pakistan.
Vol. 7 No. 9 September, 1961.

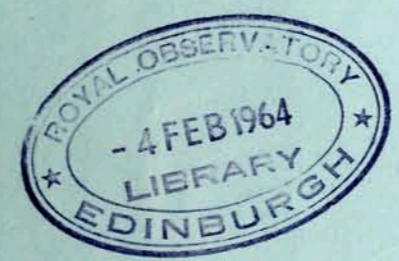
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Meteorological Service

Deputy Director,
Geophysical Institute

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Sibte Nabi Naqvi

Abdul Qadir Khan

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Pakistan Meteorological Service, Geophysical Institute, Quetta.

Vol. 7

September 1961

No. 9

CONTENTS

1.	Particulars of Stations and Instruments ...	1
2.	Major shocks ...	3
3.	Local and Minor shocks ...	20

Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Quetta (Central Station)				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Countd.)

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki), (Pal) stand for seismological observatories Pasadena (U.S.A.),
 Berkley (U.S.A.), Uppsala (Sweden), Kiruna (Sweden) & Palisade (U.S.A.) respectively.
 All times are in Greenwich Mean Time.

Seismological Bulletin of Pakistan
 Volume 7 No. 9, September 1961

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
1	Qt	ePKPZ	00	28	09 c						
		epPKPZN			47						
		ePPZNN*		29	22						
		eXZ		31	31						
		eXNE			39						
		ePPPZE		32	03						
		e!SKSNEN*		34	50						
		eXN		35	51						
		ePKKPZN		38	33						
	Wr	ePKPZ		28	18						
	Ch	eXN*			47						
		ePPN*		30	00						
		eSKSN*		35	09						
		eSKKSN*		36	20						
		e!PSN*		40	09						
		USCGS H	00	09	34.6						
		59.3 S		27.3	W						
		Sandwich Islands									
		region									
		depth about 131 km									
		Mag 7 1/2 (Pas), 7 (Berk)									
1	Wr	iPZ	04	58	33 d						
		iSZ			59 06						
	Qt	ePZE			33						
		eSZNE		05	00 51						
		H	04	57	51						
		Hindukush									
1	Lh	ePZ	19	08	49						
	Qt	ePZ			09 35						
		USCGS H	18	59	36.3						
		35.4 N									
		138.8 E									
		Honshu, Japan									
		depth about 87 km									
1	Qt	ePKPZ	19	09	48						
		iPKSNEN*			13 18						
		eSKKSN*			19 08						
	Lh	ePKPZ			09 49						
		ePKSE			13 18						
	Ch	ePKPNN*			10 08						
		USCGS H	18	50	35.4						
		13.5 N									
		92.5 W									
		Off coast of Guatemala									
		depth about 37 km									
		Mag 6 1/2 (Pas), 6 (Berk)									
2	Ch	epPPN*	00	41	05						
		eSN*			47 42						
	Lh	ePZ			38 10						
	Qt	ePZ			35 c						
		epPN			46						
		ePPZ			41 45						
		eSNE			48 54						
		Mu			Sec						
		PZ	0.3		1.3						
		Δ = 83°.8									
		USCGS H	00	26	06.2						
		52.0 N									
		170.9 W									
		Fox Islands									
		Aleutian Islands									
		depth about 39 km									
		Mag 6.3 (Qt)									

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
2	Qt	ePZ	07	43	32		Qt	ePZ			54 d
		USCGS H	07	33	24.3			USCGS H	03	17	24.6
		42.2 N	142.6	E				30.0 N	138.3	E	
		Near coast of						South of Honshu,			
		Hokkaido, Japan						Japan			
		depth about 31 km						depth about 492 km			
2	Qt	ePZ	10	56	53 c	4	Lh	ePZ	05	03	31
		epPZ		57	19		Qt	ePZ		04	07 c
		ePPPZE		58	29			USCGS H	04	53	12.9
		e(S)N*	11	02	06			46.9 N	154.2	E	
	Lh	ePZ	10	57	10 c			Kurile Islands			
		USCGS H	10	50	36.7			depth about 22 km			
		2.0 S	67.5	E		4	Ch	ePN*	10	00	37
		Southwest of Maldiv						ePcPN		01	00
		Islands, Indian Ocean						eSN*		10	01
		depth about 132 km						esSN*			20
2	Lh	ePZ	18	01	02			eScSN*			41
	Qt	ePZ			43		Lh	ePZ			00 59
		eSNEN*			08 53		Qt	ePZ			01 25 c
		USCGS H	17	52	46.1			epPZE			37
		6.0 S	105.9	E				esPZ			44
		Soenda Strait						ePPPNE			06 23
		depth about 127 km						eSNEN*			11 25
4	Qt	ePZ	01	04	13			eLN*			23.4
		USCGS H	00	52	23.5			Mu	Sec		
		52.1 N	173.4	E				PZ	0.3	1.2	
		Near Islands						$\Delta = 80^{\circ}0$			
		Aleutian Islands						USCGS H	09	49	10.7
		depth about 41 km						51.4 N	178.1	W	
4	Lh	ePZ	03	26	09			Andreanof Islands			

4

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Aleutian Islands						USCGS H	02	37	34.9
		depth about 35 km						80.0 N	2.3	W	
		Mag $\frac{1}{4}$ (Berk), 6.2 (Qt)						Arctic Ocean			
4	Qt	ePZ	16	19	43			depth about 18 km			
		USCGS H	16	09	20.1	5	Wr	ePZ	06	14	09
		1.3 N	127.7	E			Lh	ePZE			39
		Halmahera					Qt	ePZ			15 16 c
		depth about 156 km						eXZNE			35
4	Qt	ePZ	17	27	35			e(sP)NE			50
		USCGS H	17	15	49.7			e!XEN*			17 00
		52.1 N	173.8	E			Ch	iSNEN*			05
		Near Islands,						ePNN*			55
		Aleutian Islands						eXN*			18 15
		depth about 67 km						e!XN*			20 36
4	Qt	ePZ	18	57	29			iSNN*			21 55
		USCGS H	18	45	02.3			iXN*			22 38
		52.9 N	167.3	W				H 06 13 03			
		Fox Islands						38 N	73.5	E	
		Aleutian Islands						Tadzhik, S. S. R.			
		depth about 74 km						depth about 220 km			
4	Lh	ePZ	19	24	43			USCGS H	06	12	54.8
	Qt	ePZ			25 05			38.6 N	73.3	E	
		USCGS H	19	12	34.4			Tadzhik, S.S.R.			
		52.8 N	167.1	W				depth about 50 km			
		Fox Islands						Felt Peshawar,			
		Aleutian Islands						Rawalpindi & Lahore			
		depth about 147 km									
4	Qt	ePZ	20	39	05						
4	Qt	ePZ	23	32	02						
5	Qt	ePZ	02	47	23						

5

Date	Station	Phase	h	m	s
		depth about 60 km			
5	Wr	ePN	11	46	43
	Lh	ePZE		52	
	Qt	ePZE	47	10	c
		epPZE		23	
		esPZ		33	
		ePPZN	50	27	
		e!SNEN*	57	31	
		ePSN*	58	29	
		eLN*	12	10	0
		Mu	Sec		
		PZ	0.7	1.7	
		$\Delta = 84^\circ 0$			
		USCGS H 11 34 37.3			
		59.8 N 150.6 W			
		Kenai, Peninsula			
		depth about 44 km			
		Mag 6-6 $\frac{1}{4}$ (Pas), 6.5 (Qt)			
5	Qt	ePZ	14	12	49
		USCGS H 14 09 55.1			
		36.4 N 54.4 E			
		Northern Iran			
		depth about 59 km			
5	Qt	ePZ	16	52	46 \pm
		e(S)NE		53	44
	Wr	ePZ		52	48
	Lh	ePZ		59	
5	Qt	ePZ	21	18	57

6

Date	Station	Phase	h	m	s
		10.8 S 79.1 W			
		Near coast of Peru			
		depth about 45 km			
7	Qt	ePZ	07	28	30
		eSNE		29	53
8	Qt	ePZ	00	17	22
		USCGS H 00 05 13.8			
		63.1 N 150.5 W			
		Alaska			
		depth about 135 km			
8	Qt	ePZ	11	41	25
		ePKPZNE		45	04
		epPKPZ		32	
		ePPZE		46	09
		ePPPZN		48	53
		eSKSNE		51	47
		ePKKPZN		55	33
		ePSNE		56	
	Lh	ePKPZ		45	14
	Wr	ePN		41	35
		ePKPN		45	15
	Ch	epPKPN*		46	02
		esPPN*		48	02
		e!SKSN*		52	07
		ePSKSN*		57	19
		USCGS H 11 26 32.8			
		56.1 S 27.3 W			
		Sandwich Islands			
		region			
		depth about 125 km			

7

Date	Station	Phase	h	m	s
		Mag 7 $\frac{1}{2}$ -7 $\frac{3}{4}$ (Pas) 8 (Berk)			
8	Qt	ePZ	17	40	38
		epPZ		41	12
		USCGS H 17 30 37.4			
		0.4 S 123.3 E			
		Celebes			
		depth about 169 km			
9	Lh	ePZ	09	22	30
	Qt	ePZ		55	
		eSN*		33	22
		Mu	Sec		
		PZ	0.2	1.3	
		$\Delta = 86^\circ 0$			
		USCGS H 09 10 25.2			
		52.5 N 169.4 W			
		Fox Islands			
		Aleutian Islands			
		depth about 61 km			
		Mag 6.1 (Qt)			
9	Qt	ePZ	09	26	04
		USCGS H 09 16 08.6			
		33.8 N 139.6 E			
		Off coast of Honshu,			
		Japan			
		depth about 151 km			
9	Qt	ePZ	11	59	32
		ePcPZ		40	
		USCGS H 11 47 12.4			

Seismological Bulletin of Pakistan
Volume 7 No. 9, September 1961

Major Shocks

Date	Station	Phase	h	m	s
		51.7 N 174.9 W			
		Andreanof Islands			
		Aleutian Islands			
		depth about 50 km			
10	Qt	ePZ	01	54	19
		USCGS H 01 43 07.2			
		49.2 N 158.2 E			
		Off south coast of Kamchatka			
		depth about 33 km			
10	Qt	eXZ	05	03	37
		(Short activity 16 sec earlier than PKP)			
		ePKPZ			
		e!PPZNE 06 32 51			
	Wr	eXN 03 45			
		(Short activity earlier than PKP)			
	Lh	ePKPZ 57			
		USCGS H 04 45 27.1			
		22.7 S 63.1 W			
		Salta Province			
		Argentina			
		depth about 519 km			
10	Qt	ePZ 16 23 00			
		esSN* 27 56			
		USCGS H 16 17 20.0			
		37.2 N 36.6 E			
		Turkey			
		depth about 28 km			

Seismological Bulletin of Pakistan
Volume 7 No. 9, September 1961

Major Shocks

Date	Station	Phase	h	m	s
		eSN* 54 36			
		eLN* 12 01.2			
		USCGS H 11 36 48.4			
		1.1 N 120.3 E			
		Northern Celebes			
		depth about 81 km			
11	Qt	ePKP ₂ Z 15 06 53			
	Lh	ePKP ₂ Z 07 20			
		USCGS H 14 47 30.5			
		36.6 S 69.0 W			
		Mendoza Province			
		Argentina			
		depth about 226 km			
11	Lh	ePZ 20 08 51			
	Wr	ePN 09 10			
	Qt	ePZ 29			
		eSN* 18 54			
		eLN* 27.9			
		USCGS H 19 57 58.2			
		4.1 S 134.3 E			
		Aroe Islands			
		depth about 19 km			
11	Lh	ePZ 23 56 59 c			
	Qt	ePZ 57 41 c			
		USCGS H 23 47 19.5			
		42.8 N 145.4 E			
		Near east coast of Hokkaido, Japan			
		depth about 18 km			
12	Lh	ePZ 12 36 54			

Siesmological Bulletin of Pakistan
Volume 7 No. 9, September 1961

Date	Station	Phase	h	m	s
	Wr	ePZ	10	15	
	Lh	ePZ		35	
		USCGS H	14 05	40.5	
			32.9 N	47.9 E	
			Iraq - Iran border		
			depth about 97 km		
13	Qt	ePZ	14	14	34
		USCGS H	14 04	40.1	
			9.3 S	112.9 E	
			South of Java		
			depth about 93 km		
13	Qt	ePZ	15	52	19
		e(S)E		55	18
		eLN*		56.0	
	Wr	ePZ		52	55
	Lh	ePZ		53	23
		USCGS H	15 48	27.2	
			32.8 N	47.6 E	
			Iran - Iraq border		
			depth about 74 km		
13	Qt	ePKPZ	21	39	00
		ePKP ₂ NE		18	
		ePKSN*		42	45
	Wr	ePKP ₂ Z		39	15±
	Lh	ePKPZ		10±	
		USCGS H	21 19	26.2	
			41.6 S	73.2 W	
			Southern Chile		
			depth about 154 km		
			Mag 7 (Berk)		

Seismological Bulletin of Pakistan
Volume 7 No. 9, September 1961 Major Shocks

Date	Station	Phase	h	m	s
14	Qt	ePZ	08	07	05
	Wr	ePZ		40	
		USCGS H	08 03	09.0	
			33.6 N	48.8 E	
			Iran		
			depth about 30 km		
14	Qt	ePKP ₂ Z	18	51	07
		USCGS H	18 31	17.8	
			56.2 S	139.9 W	
			South Pacific Ocean		
			depth about 25 km		
14	Qt	ePZ	22	00	51
		USCGS H	21 50	41.3	
			37.4 N	141.1 E	
			Near east coast of		
			Honshu, Japan		
			depth about 60 km		
15	Qt	ePZ	01	52	02
		epPZN		11	
		ePPZNE		49	
		ePPPZ		53	06
		ePcPZ		55	16
		eSNEN*		56	48
		e!XN*		57	54
		iSSN*		58	15
		eLN*		59.6	
	Wr	ePZ		52	25
	Lh	ePZ		51	
		eSNE		58	10
		USCGS H	01 46	08.4	

Seismological Bulletin of Pakistan
Volume 7 No. 9, September 1961 Major Shocks

Date	Station	Phase	h	m	s
			35.1 N	33.9 E	
			Cyprus		
			depth about 25 km		
15	Wr	ePZ	21	34	04 c
	Qt	ePZ		09	
		USCGS H	21 24	08.5	
			10.7 S	112.7 E	
			South of Java		
			depth about 100 km		
16	Qt	ePZ	12	19	30 d
		USCGS H	12 09	49.8	
			28.3 N	138.6 E	
			South of Honshu, Japan		
			depth about 388 km		
16	Qt	ePKPZ	20	21	08
		USCGS H	20 02	47.8	
			10.6 S	69.8 W	
			Brazil - Peru border		
			depth about 629 km		
16	Qt	ePZ	21	23	29
	Lh	ePZ		43	
		USCGS H	21 15	26.9	
			12.8 S	66.3 E	
			Indian Ocean		
			900 km of Chagos		
			Islands		
			depth about 25 km		
17	Lh	ePZ	01	22	11
	Qt	ePZ		48	
		USCGS H	01 11	43.7	

Date	Station	Phase	h	m	s	
			4.1 S	129.7 E		
			Banda Sea			
			depth about 46 km			
17	Qt	ePZ	05	32	44	
	Wr	ePZ		59		
		USCGS H	05 30	07.3		
			37.6 N	57.3 E		
			Iran			
			depth about 25 km			
17	Lh	ePZ	08	49	51 c	
	Wr	ePZ		50	11	
	Qt	ePZ		42	c	
		epPZNE		52		
		ePPZNE		52	39	
		eSNN*		57	48	
		esSE		57		
		eLN*		09	01.9	
			Mu	Sec		
			PZ	0.5	1.8	
			$\Delta = 49.8$			
	Kr	ePE		08	50	45
		USCGS H	08 41	53.6		
			23.9 N	122.2 E		
			Off coast of Formosa			
			depth about 35 km			
			Mag 6.2 (Qt)			
17	Kr	ePnZ		11	41	59
	Qt	ePnZ		42	19	
		eP*ZN		25		
		ePgZNE		31		
		iSnNE		59		

Date	Station	Phase	h	m	s
		iSgNE	43	15	
	Wr	ePnZ		27	
		H 11 41 24			
		27 N 67½ E			
		Near Dadu			
		West Pakistan			
17	Lh	ePZ	23	34	06 c
	Wr	ePN		22	
	Qt	ePZ		38	
		epPNE		48	
		eSNE	45	03	
		esSN*		23	
		USCGS H 23 22 06.3			
		5.9 S 147.4 E			
		Near east coast of			
		New Guinea			
		depth about 45 km			
18	Wr	ePZ	05	13	35
		iSZ		14	09
	Qt	ePZ		28	
		eSNE		15	44
		H 05 12 50			
		Northern Afghanistan			
18	Qt	ePZ	06	37	12
18	Qt	e!PZ	11	05	07 d
		e!PPZNE		19	
		iPPNE		35	
		eSNEN*	08	20	
		eLN*	08.8		
		Mu Sec			
		PZ 0.9 1.3			

Major Shocks

Date	Station	Phase	h	m	s
		PN 1.1 1.5			
		IE 1.1 1.5			
		$\Delta = 17^\circ 4$			
	Wr	ePZ	11	05	15
	Kr	ePZ		45	±
		eSE		09	26
	Lh	ePZ	05	52	d
		eSNE		09	49
		H 11 01 01			
		40¼ N 50 E			
		Caspian Sea			
		USCGS H 11 01 00.8			
		40.8 N 50.1 E			
		Caspian Sea			
		depth about 31 km			
		Mag 5.8 (Qt)			
18	Qt	ePZ	18	15	29
18	Qt	ePZ	18	57	36
19	Qt	eXZ	02	43	46
		(Short activity earlier			
		than PKP)			
		eXZ	02	43	55
		ePKPZ		44	02
		epPKPZ		46	19
		ePPZNE		40	
		epPPZN		48	38
		ePPPE		49	51
		e!XNE		52	40
		e!SSN*	03	03	43
		e!sSSN*	07	09	

Date	Station	Phase	h	m	s
	Wr	ePKPZ	02	44	05
	Lh	ePKPZ		13	±
		USCGS H 02 25 49.2			
		20.3 S 63.2 W			
		Southern Bolivia			
		depth about 609 km			
		Mag 6½ (Pas), 6¼ (Berk)			
19	Wr	ePZ	06	21	05
	Qt	ePZ		30	
		USCGS H 06 09 56.6			
		14.8 N 146.8 E			
		Mariana Islands			
		depth about 61 km			
19	Wr	ePZ	09	28	55
	Qt	ePZ		29	12
		USCGS H 09 18 55.0			
		2.4 N 126.3 E			
		Molucca Passage			
		depth about 84 km			
19	Qt	ePZ	09	40	58
		eXN*		48	50
	Wr	ePZ		41	24
19	Qt	ePKPZ	10	05	32
		ePPZNE		08	03
		USCGS H 09 46 17.7			
		6.7 N 82.4 W			
		South of Panama			
		depth about 33 km			
		Mag 6¼-6½ (Pas),			
		5¼-6 (Berk)			

Major Shocks

Date	Station	Phase	h	m	s
19	Wr	ePZ	13	54	33
	Qt	ePZ		49	
		USCGS H 13 44 28.2			
		1.2 N 125.5 E			
		Molucca Passage			
		depth about 54 km			
19	Wr	iPnZ	16	07	59 c
	Qt	ePnZ		08	05
		eSnNE		44	
	Lh	ePnZ		15	
		ePgZ		23	
		H 16 07 15			
		32 N 70 E			
		West Pakistan			
19	Qt	ePKPZ	18	43	16
		USCGS H 18 25 29.0			
		21.6 S 179.4 W			
		Fiji Islands region			
		depth about 639 km			
19	Qt	ePZ	20	09	21
	Lh	ePZ		10	11
		USCGS H 20 05 18.3			
		41.0 N 50.3 E			
		Caspian Sea			
		depth about 54 km			
20	Lh	ePZ	19	15	49
	Wr	ePZ		16	04
	Qt	ePZ		20	
		epPZE		27	
		esPN		35	

Seismological Bulletin of Pakistan
Volume 7 No. 9, September 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPZ	19	38				Off coast of northern Chile			
		eSKKSN*	26	49				depth about 18 km			
		iSNEN*	59			23	Qt	ePZ	03	11	31
		ePPSN*	28	22		23	Wr	ePZ	03	56	22 d
		eXN*	29	31			Qt	ePZ	57	01	d
		e(SS)N*	32	56				USCGS H 03 48 29.9			
		eLN*	40.0					41.7 N 131.9 E			
		USCGS H 19 03 37.1						Sea of Japan			
		3.6 S 150.9 E						depth about 527 km			
		New Britain				23	Qt	ePKPZ	08	35	20
		depth about 30 km						USCGS H 08 16 18.4			
		Mag 6½ (Berk),						28.5 S 177.2 W			
		6¼ - 6½ (Pas)						Kermadec Islands			
21	Qt	ePZ	05	26	37			depth about 20 km			
	Wr	ePZ	27	12		23	Wr	iPZ	11	41	36 d
	Lh	ePZ	40				Lh	ePZ	42	13	
21	Qt	ePZ	15	18	51		Qt	ePZ	41		d
21	Lh	ePZ	17	11	41			esPZE	43	23	
	Wr	ePZ	45					iSNE	44	11	
	Qt	ePZ	12	55				H 11 40 44			
		eSNE	15	10				37 N 72½ E			
		H 17 10 02						Tadzhik, S.S.R.			
		36½ N 79½ E						depth about 200 km			
		Southern Sinkiang				24	Qt	ePKPZ	19	23	43 d
		Province, China						eXZ	58		
21	Qt	ePKPZ	18	38	48			ePKSZNEN*	27	02	
	Lh	ePKP ₂ Z	39	05				USCGS H 19 04 40.7			
		USCGS H 18 19 15.2						18.4 N 98.6 W			
		26.2 S 70.8 W									

Seismological Bulletin of Pakistan
Volume 7 No. 9, September 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Puebla, Mexico						USCGS H 21 12 41.0			
		depth about 81 km						75.9 N 7.3 E			
24	Ch	ePZ	21	49	06			Svalbard region			
		eSE	55	34				depth about 64 km			
	Lh	ePZ	50	30		26	Qt	ePKP ₂ Z	13	05	17
	Wr	ePZ	40					USCGS H 12 45 44.6			
	Qt	ePZ	51	14				37.0 S 73.1 W			
		eXNE	26					Near coast of			
		epPN	38					central Chile			
		esPZNE	49					depth about 141 km			
		ePPE	53	40		26	Wr	ePZ	21	07	39
		eSNEN*	59	34			Lh	ePZ	08	04	±
		e(PKPPKP)Z	22	20	31		Qt	ePZ	47		
		USCGS H 21 40 58.8						eSNE	10	32	
		33.3 N 141.3 E						H 21 06 31			
		South of Honshu, Japan						Tadzhik, S.S.R.			
		depth about 93 km				27	Qt	ePKPZ	06	51	54
25	Qt	ePZ	02	39	32			ePPZNE	53	22	
		USCGS H 02 27 13.4						epPKPE	54	13	
		60.3 N 153.0 W						eXZ	39		
		Southern Alaska						eSKSN	58	02	
		depth about 125 km						ePKKPZE	07	02	07
		Mag 5½-6 (Pas)						eXN*	06	11	
25	Qt	ePZ	10	54	20			eSSN*	09	01	
25	Qt	ePZE	14	56	14			USCGS H 06 34 03.7			
		USCGS H 14 47 08.6						17.4 S 178.7 W			
		4.4 N 122.7 E						Fiji Islands			
		Celebes						depth about 576 km			
		depth about 598 km						Mag 5½-6 (Pas)			
25	Qt	ePZ	21	22	00	27	Qt	ePZ	08	24	32

Seismological Bulletin of Pakistan
Volume 7 No. 9, September 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	USCGS H 08 22 04.4							eSEN*	43	47	
	29.0 N 54.7 E							esSN*	44	00	
	Southern Iran							Mu Sec			
	depth about 79 km							PZ 0.5 1.5			
27	Qt	ePZ	08	48	49			$\Delta = 85^\circ \cdot 0$			
27	Ch	ePZ	11	32	48			USCGS H 19 20 48.6			
		epPZ			57			52.5 N 168.7 W			
		ePPZ			35 52			Fox Islands			
	Lh	ePZ			32 59			Aleutian Islands			
	Qt	ePZ			33 22			depth about 42 km			
		epPZ			30			Mag 6.4 (Qt)			
		ePPZE			36 36	27	Lh	ePZ	19	39	13 c
		eSNEN*			43 48		Qt	ePZ			36 c
		esSN*			44 01			epPZNE			45
	USCGS H 11 20 46.8							ePPZ			42 50
	52.3 N 168.7 W							eXNEN*			43 45
	Fox Islands							e!SNEN*			50 01
	Aleutian Islands							e!sSN*			16
	depth about 27 km							eSSN*			55 50
27	Qt	ePKPZ	12	26	14 d			Mu Sec			
		ePPZNE			27 21			PZ 0.8 1.5			
		eSKSN*			33 00			$\Delta = 85^\circ \cdot 0$			
	USCGS H 12 07 39.2							USCGS H 19 27 00.7			
	59.4 S 24.2 W							52.2 N 168.7 W			
	Sandwich Islands							Fox Islands			
	depth about 110 km							Aleutian Islands			
27	Lh	ePZ	19	32	57			depth about 22 km			
	Qt	ePZ			33 21			Mag 6.8 (Qt)			
		epPZE			34	27	Qt	ePZ	20	21	46
		ePPZ			36 35			USCGS H 20 12 59.2			
								19.4 N 120.4 E			

Seismological Bulletin of Pakistan
Volume 7 No. 9, September 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Near north coast of Luzon, Philippine Islands					Qt	ePZ	35	03	
		depth about 73 km						epPNE			29
27	Lh	ePZ	21	15	07			eSN*			43 28
	Qt	ePZ			58			eLN*			51.5
		USCGS H 21 06 56.3						USCGS H 03 24 43.4			
		26.7 N 125.0 E						30.5 N 141.3 E			
		Ryukyu Islands						South of Honshu, Japan			
		depth about 17 km						depth about 125 km			
27	Qt	ePZ	21	40	35			Mag 6 (Pas)			
28	Lh	ePZ	01	32	04	28	Lh	ePZ	03	44	12
	Qt	ePZ			34 c		Qt	ePZ			33
		eXZN			45		28	Qt	ePZ		04 29 34 c
		epPZ			53			USCGS H 04 19 06.6			
		ePcPZNE			33 58			30.0 N 141.1 E			
		ePPZE			34 21			South of Honshu, Japan			
		eSN*			39 25			depth about 75			
		eSSN*			42 54	28	Wr	iPZ	05	01	28 d
		eLN*			44.1		Lh	ePZ			02 08
		Mu Sec					Qt	iPZ			24 d
		PZ 0.7 1.8						esPZNE			03 13
		$\Delta = 48^\circ \cdot 4$						iSZNEN*			40
	Wr	ePN	01	32	35			Mu Sec			
		USCGS H 01 23 59.6						PZ 2.9 1.5			
		3.9 S 102.0 E						$\Delta = 6^\circ \cdot 7$			
		Sumatra						H 05 00 47			
		depth about 78 km						35 $\frac{1}{2}$ N 70 $\frac{1}{2}$ E			
		Mag 6.3 (Qt)						Hindukush			
28	Lh	ePZ	03	34	19			depth about 250 km			
	Wr	ePZ			30			USCGS H 05 00 43.0			

Seismological Bulletin of Pakistan
Volume 7 No. 9, September 1961

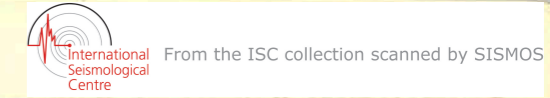
Major Shocks

Date	Station	Phase	h	m	s
		36.5 N 70.7 E			
		Hindukush			
		depth about 233 km			
		Mag 6.1 (Qt)			
28	Qt	ePZ	22	38	38 d
		ePPZNE		45	
		eSNEN*	40	16	
		eLN*	40	7	
	Wr	ePN	39	45	
	Lh	ePZ	40	03	
		USCGS H 22 36 27.5			
		27.6 N 57.1 E			
		Southern Iran			
		depth about 56 km			
29	Ch	ePZ	08	47	31
		eSZNN*		49	05
	Lh	ePZ	50	47	
	Wr	ePN	51	23	
	Qt	ePZ		28	d
		eXZN		40	
		epPE		57	
		ePPE		52	36
		eXZNEN*		57	36
		USCGS H 08 45 26.9			
		13.8 N 94.0 E			
		Andaman Islands			
		depth about 133 km			
29	Ch	ePZ	16	59	25
	Lh	ePZ	17	00	13
		epPZ		24	

Seismological Bulletin of Pakistan
Volume 7 No. 9, September 1961

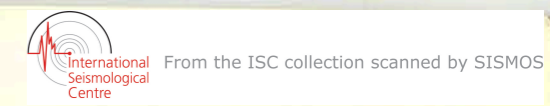
Major Shocks

Date	Station	Phase	h	m	s
		Northern Celebes			
		depth about 110 km			
		Mag 6.2 (Qt)			
29	Ch	iPZE	22	38	03 d
		e(S)N*		39	10
		iSZE		16	
	Lh	ePZ		16	
		e(S)ZNE		41	22
	Wr	ePN		39	56
	Qt	ePZ		40	36
		epPZNE		58	
		e(S)NN*		43	45
		eSNE		51	
		USCGS H 22 36 25.2			
		28.2 N 87.9 E			
		Southern Tibet			
		depth about 76 km			
29	Qt	ePKPZ	22	57	23
		USCGS H 22 38 05.9			
		1.7 N 79.3 W			
		Near coast of			
		southern Colombia			
		depth about 60 km			
30	Lh	ePZ	00	31	14
	Qt	ePZ			54
		USCGS H 00 21 18.8			
		44.4 N 148.9 E			
		Kurile Islands			
		depth about 49 km			
30	Lh	ePZ	01	44	48



Date	Phase	h m s	Date	Phase	h m s
	Quetta				
1	ePZE	07 17 10	5	eSNE	41 18
	eSNE	32		e(P)E	10 13 30
1	ePE	10 24 40	5	eSE	14 45 ±
1	ePgZE	10 28 30.2		ePZE	12 23 23
	iSgNE	32.8	5	eSNE	24 42
1	ePgE	15 08 12.3		ePgE	17 00 33.6
	eSgE	24.0	5	eSgE	49.1
1	eXZ	19 42 30		ePgZE	23 04 26.2
1	ePE	22 42 29 ±	5	iSgNE	39.7
2	ePZ	02 46 09		ePE	23 07 34
	eSNE	47 22	6	eSNE	50
2	eXZ	06 46 14		ePZE	00 05 18
	eXE	47 45	6	eSE	06 59
2	ePE	20 50 28		ePZE	01 20 22
3	ePE	06 15 24	6	ePZ	02 08 23
	eSE	16 58	6	eXZ	02 39 11
3	ePE	08 15 04		ePZ	03 25 31 ±
4	ePZE	02 08 23	6	e(S)NE	47
	eSNE	44		ePE	04 50 11
4	ePgE	06 18 08.8	6	eXZ	24
	eSgE	22.0	6	eXE	08 02 52
4	ePgE	11 35 21.0		ePgE	11 03 23.0
	eSgE	36.6	6	iSgNE	25.8
4	ePZE	18 41 23.5		ePgZE	11 54 23.2
	eSNE	46.1	6	iSgNE	36.0
5	ePE	00 19 21 ±	6	ePE	20 23 33
	eSEN	58	6	ePE	22 03 31
5	ePE	01 24.0	7	ePgN	02 31 42.0
5	ePE	07 39 34	7	iSgN	43.8
			7	e(P)Z	04 40 38

Date	Phase	h m s	Date	Phase	h m s
			10	ePZ	06 05 28 ±
7	eXE	41 11		eSN	46
	ePZE	09 23 53	10	eXN	08 29.0
7	eSNE	25 20	10	eXZ	08 35 00
	ePE	09 59 33		eXZ	36 36
7	eSE	58	10	ePgZ	10 38 01.1
	eXZE	13 44.0		iSgN	09.7
8	ePN	03 06 20	10	eXN	19 32.0
8	ePgZN	08 34 30.7 d	11	eXZ	02 29.0
	iSgZNE	32.2	11	ePZ	05 44 15
8	eXE	11 40 13.5		eSN	41
8	ePZ	17 25 24	11	ePgZ	17 34 27.8
8	eXE	18 17 30		iSgNE	29.2
8	ePZ	19 15 09	12	ePgNE	12 58 07.3
	iSNE	31		eSgNE	13.7
8	eXE	23 34 34	13	ePZ	09 14 00
	eXE	35 17		eSN	15 36
9	eXE	00 55 34	14	e(P)Z	04 15 47
	eXZ	56 02	14	eXZ	04 20.5
9	ePgZ	01 51 41.8	14	ePZ	07 03 16
	eSgNE	57.4		eXZ	21
9	ePZ	07 47 58	14	eXZ	08 34.0
	eSNE	22	14	ePZ	08 59 26
9	ePZ	10 13 39	14	eXZ	10 56.0
	eSNE	14 37	15	eXZ	04 51.0
9	ePgZE	13 42 05	15	ePZ	06 58 33
	eSgN	11		eSNE	54
9	ePZ	23 05 26	15	ePZ	17 30 56
10	eXN	00 53 19		eSN	32 21
10	ePN	01 01 57.6	15	ePgZ	23 12 33.8
	eSNE	33.6			



Seismological Bulletin of Pakistan
Volume 7 No. 9, September 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	eSgN	36.7	19	ePZ	07 33 11
15	ePZ	23 28 50		eSNE	34 30
	eSN	29 12	19	ePZ	16 08 05
16	e(P)Z	05 02 28	19	ePZ	21 52 32
16	ePZ	08 09 18		e(S)N	59
	eXZ	31	19	ePZ	22 42 34
16	ePgZ	09 40 44		eSN	43 02
	iSgNE	48.6	19	eXZ	22 51 54
16	eXE	14 59.0	20	ePZ	01 35 08±
16	ePE	15 39 37±		eSNE	49
	eSZE	40 44	20	e(P)Z	06 54 31
16	ePE	16 29 23		ePZ	40
	eSE	30 38	20	ePE	11 32 09
16	ePZ	19 49 32	20	ePZ	12 42 58
	eSNE	50 48		eXZ	43 34
17	eXZ	00 01.0	20	eXE	16 13 09
17	ePZ	09 10 19	20	ePE	16 57 21
	eXZ	22		eSNE	59 17
17	ePZ	11 42 19	20	eXZ	17 23 15
	eSNE	57	20	ePZ	18 44 06
17	ePgN	22 32 35±		eSNE	57
	eSgNE	48	20	ePgZ	20 15 47
17	ePE	23 07 49		eSgNE	16 02
	eSE	09 04	20	eXZ	21 41 01
18	ePZ	05 14 28	21	ePgE	03 33 47.1
	eSNE	15 44		eSgNE	49.6
18	ePZ	06 14 33	21	eXE	03 35.1
	e(S)N	15 38	21	ePZ	03 06 28
19	ePZ	05 45 59	21	eXE	09 19 42
	eXNE	46 45	21	ePE	14 16 42±

22

Seismological Bulletin of Pakistan
Volume 7 No. 9, September 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	eXE	18 49	26	ePZ	21 08 47
22	ePZ	00 18 43		eSNE	10 32
	eSNE	19 06	28	eXZ	02 31.0
23	ePgZ	05 34 27.5	28	ePZE	05 32 01
	eSgNE	34.5		eSN	33 54
23	eXE	05 55 20	28	ePZ	08 33 41
23	ePZ	16 45 50		eSN	14 03
	eSNE	47 11	28	ePgE	10 02 05.0
23	ePZ	18 58 24		eSgE	17.0
24	ePZ	04 23 01	28	ePZ	23 07 39
	e(S)N	53	29	ePgZ	02 59 28.4
24	eXE	07 38 29		eSgZ	30.9
24	ePE	10 15 23	30	ePZ	09 14 52
	eSE	16 48	30	eXZE	10 29 24
24	ePZ	14 50 45	30	eXZ	16 51 37
	eSNE	52 03	30	eXZ	19 23 10
24	eXZ	17 35 45	30	eXZ	19 40 37
25	ePZ	02 59 17			
	eXZ	43		Warsak	
25	ePZ	13 13 26	1	iPZ	16 48 37
	eSNE	43	1	ePZ	19 41 19
25	ePgZ	16 07 09		eSZ	43
	e(S)gE	22	2	ePZ	01 30 36
25	ePgZ	16 20 19		eSZ	31 09
	eSgNE	33	2	iPZ	02 45 11
26	ePE	02 35 02		iSZ	37
	eSNE	36 25	2	ePZ	06 45 24
26	ePZ	16 36 46		ePZ	13 01 07
	eSNE	37 51	2	eSZ	35
			3	ePZ	06 14 58

23

Seismological Bulletin of Pakistan
Volume 7 No. 9, September 1961

Date	Phase	h m s
3	ePZ	16 08 50
4	ePZ	03 50 12
5	ePN	12 22 26
	eSN	57
6	ePN	00 04 08
	eSN	05 00
6	ePZ	04 49 26
7	ePN	09 23 44
	eSN	24 23
9	ePN	07 57 00
9	ePN	10 47 14
10	ePN	00 50 58
10	ePN	19 30 02
	eSN	31
10	ePN	19 55 21
	eSN	54
11	ePN	02 57 58
11	ePN	05 43 38
	eSN	44 00
11	ePN	10 16 38
12	ePN	01 37 03
13	ePN	00 37 02
13	ePN	01 13 45
13	ePN	09 12 53
	iSZ	13 37
13	ePZ	14 20 59
14	ePZ	01 39 14
	iSZ	50
14	ePZ	06 01 01
14	ePZ	07 03 34

24

Minor Shocks

Date	Phase	h m s
14	ePZ	11 37 58
15	ePZ	05 04 59
15	iPZ	17 30 01
	iSZ	35
16	ePZ	01 57 42
16	ePZ	07 35 37
	iSZ	36 07
16	ePZ	09 19 36
16	iPZ	15 38 33
	iSZ	55
16	ePZ	16 28 22
	iSZ	49
16	iPZ	19 48 39
	iSZ	49 00
17	ePZ	15 45 09
	iSZ	43
17	eSN	22 43 35
17	ePN	23 06 51
	eSN	07 18
18	ePZ	06 13 41
	iSZ	14 15
19	ePZ	22 42 13
20	iPZ	08 01 56
20	ePZ	20 21 19
21	ePZ	03 10 37
	iSZ	11 03
21	iPZ	05 43 53
21	ePZ	14 15 45
22	ePZ	15 36 21
	iSZ	59

Seismological Bulletin of Pakistan
Volume 7 No. 9, September 1961

Date	Phase	h m s
23	iPZ	16 44 74
	iSZ	45 19
24	iPZ	07 36 07
	iSZ	36
24	iPZ	10 14 26
	iSZ	59
24	ePZ	14 49 52
	iSZ	50 26
24	iPZ	15 38 21
25	ePZ	02 58 33
25	iPZ	05 52 00
	iSZ	42
25	iPZ	17 17 39
26	ePZ	02 34 03
	eSZ	32
26	ePZ	07 11 01
26	ePZ	07 58 18
27	ePZ	11 04 44
30	ePZ	08 11 04
	iSZ	35
30	ePZ	11 26 57
	iSZ	27 33
30	ePZ	16 33 18
	eSZ	46
30	iPgZ	17 01 44
	iSgZ	47
30	iPgZ	16 49 13
30	ePgN	22 28 48
	eSgN	50
	Karachi	
6	e(P)Z	06 45 05±

25

Minor Shocks

Date	Phase	h m s
	iSZ	47 40
16	ePgZ	04 15 39.5
	iSgE	42.5
17	eXZ	09 09 54
17	ePZ	11 41 59
	iSE	42 39
	Lahore	
1	ePZ	16 48 41
	eSZ	49 09
9	eXZ	19 30 19
15	ePZ	17 30 41
	iSZ	31 46
16	eSNE	19 50 21
17	eXZ	11 44 05
17	ePZ	14 22 16
21	ePZ	23 36 30
27	iXE	06 57 34
29	ePZ	18 41 15
	eSZNE	41
30	e(P)Z	16 49 20
	eXZ	50 17
	Chittagong	
1	eXN	01 12.0
1	ePgN	02 17 43
	eSgN	53.5
1	eXN	05 38.0
1	ePgNN*	13 30 21
	eSgN	33

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
1	eXN	18	56	0					
1	ePgN	21	42	19					
	eSgN			33					
2	ePgN	13	06	13					
	eSgN			24					
4	ePN	02	19	48					
6	eXN	22	18	0					
7	eXN	06	04	20					
8	ePgNN*	17	51	09					
	eSgNN*			20					
9	eXN*	07	16	10					
26	eXZNE	00	56	0					

PAKISTAN

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7 No. 10 October, 1961.

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7

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GEOPHYSICAL INSTITUTE

QUETTA.

Pakistan Meteorological Service

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Meteorological Service

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Seismic

— : —

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Vol. 7

October 1961

No. 10

CONTENTS

1.	Particulars of Stations and Instruments ...	1
2.	Major shocks ...	3
3.	Local and Minor shocks ...	19

Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limest one
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
<u>Quetta (Central Station)</u>				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Countd.)

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 ,,	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 ,,	—	—
Lahore				
Sprengnether	Z	1.8 ,,	Critical	4,900
"	N	1.7 ,,	"	4,200
"	E	1.6 ,,	"	4,100
Karachi				
Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 ,,	"	4,700
"	E	1.4 ,,	"	4,700
Chittagong				
Sprengnether	Z	1.7 ,,	Critical	5,200
"	N	1.8 ,,	"	5,700
"	E	1.5 ,,	"	3,600
"	N	7.0 ,,	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 ,,	—	—
Warsak				
Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 ,,	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki), (Pal) stand for seismological observatories Pasadena (U.S.A.
 Berkley (U.S.A.), Uppsala (Sweden), Kiruna (Sweden) & Palisade (U.S.A.) respective
 All times are in Greenwich Mean Time.

Seismological Bulletin of Pakistan
 Volume 7 No. 10, October 1961

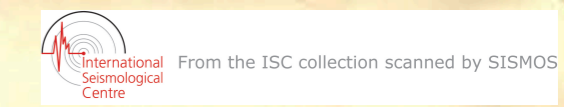
				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
1	Lh	ePZ	00 21 34		Qt	ePZ	57
	Wr	ePN	52		USCGS H	23 12 05.2	
	Qt	ePZ	22 33		23.9 N	122.3 E	
		USCGSH	00 16 03.1			Near coast of Formosa	
		34.4 N	104.9 E			depth about 25 km	
		Kansu Province		2	Qt	ePPZ	06 14 23
		depth about 32 km			USCGS H	05 53 37.5	
1	Wr	ePZ	03 10 46		33.9 S	179.6 E	
	Lh	ePZ	57			Off coast of North Island	
	Qt	ePZ	11 54			New Zealand	
		USCGS H	03 07 08.5			depth about 30 km	
		43.5 N	86.0 E	2	Lh	ePZ	06 30 21
		Sinkiang Province			Kr	iPZ	29 c
		China			Wr	iPZ	48 c
		depth about 25 km			Qt	ePZ	51 c
1	Wr	ePZ	14 18 35		USCGS H	06 21 32.8	
		iSN	19 11		7.6 S	107.0 E	
	Lh	ePZ	14			Near coast of Java	
		eSN	20 20			depth about 85 km	
	Qt	ePZ	19 40	2	Qt	ePPZ	07 23 23
		eSE	21 07		USCGS H	07 02 40.4	
		H	14 17 44		33.8 S	179.5 E	
		37.4 N	71.2 E			Off coast of North Island	
		Hindukush				New Zealand	
		depth about 150				depth about 57 km	
		USCGS H	14 17 41.0	2	Qt	ePZ	07 29 01
		37.6 N	71.8 E			eXE	34 37
		Hindukush				eSNEN*	50
		depth about 122 km				eLN*	37.7
1	Lh	ePZ	23 20 05		Wr	ePZ	29 19

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Date	Station	Phase	h m s	Date	Station	Phase	h m s
	Lh	ePZ	45	4	Qt	ePZ	06 25 50
	USCGS H	07 21 49.4			USCGS H	06 14 55.5	
	37.2 N	22.2 E			22.7 N	143.8 E	
	Near coast of Greece				Northern Mariana		
	depth about 72 km				Islands		
2	Qt	ePZ	08 21 17				
	USCGS H	08 09 07.1					
	51.4 N	179.4 E					
	Andrean of Islands						
	Aleutian Islands						
	depth about 45 km						
2	Wr	ePZ	12 03 50				
	Qt	ePZ	04 12				
	USCGS H	11 52 33.8					
	1.5 S	138.3 E					
	Near coast New Guinea						
	depth about 41 km						
2	Lh	ePZ	19 09 03				
	Qt	ePZ	10 03				
3	Qt	ePZ	01 08 21±				
	USCGS H	01 01 13					
	35.4 N	22.7 E					
	Mediterranean Sea						
	near Crete						
	depth about 44 km						
3	Qt	ePZ	09 38 44				
	USCGS H	09 35 09.1					
	37.7 N	50.8 E					
	Caspian Sea						
	depth about 60 km						

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Date	Station	Phase	h m s	Date	Station	Phase	h m s
	Qt	ePZ	43				
	eSN*	50 42					
	USCGS H	22 35 00.8					
	24.0 N	121.9 E					
	Near coast of Formosa						
	depth about 56 km						
5	Ch	ePZ	23 09 41				
	Wr	iPZ	10 11				
	Lh	ePZ	11				
	Qt	ePZ	48				
	USCGS H	23 01 07.3					
	51.0 N	149.7 E					
	Sea of Okhotsk						
	depth about 518 km						
6	Qt	ePZ	01 36 17				
	USCGS H	01 25 29.3					
	47.6 N	152.0 E					
	Kurile Islands						
	depth about 31 km						
6	Qt	iPZ	07 09 42				
	eSN*	10 04					
	Wr	iPZ	50				
	H	07 09 12					
	Central Baluchistan						
	West Pakistan						
6	Wr	ePZ	11 13 49				
	Qt	ePZ	14 26				
	USCGS H	11 04 22.5					
	42.4 N	142.1 E					
	Hokkaido, Japan						



Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961
Major Shocks

Date	Station	Phase	h m s
			depth about 115 km
6	Qt	ePZ	13 35 44
	USCGS H	13 26 46.3	
	19.6 N	122.1 E	
	Near coast of Luzon		
	depth about 70 km		
7	Wr	iPnZ	04 22 40
	Qt	ePnZ	42
		ePgZ	54
		eSnN	23 16
		eSgEN*	32
	Lh	ePnZ	22 51
		eSgN	23 49
		H	04 21 53
		31.5 N	70 E
		Suleman Range	
		West Pakistan	
		USCGS H	04 21 56.1
		31.4 N	70.2 E
		West Pakistan	
		depth about 59 km	
8	Qt	ePZ	03 10 23
	USCGS H	02 57 49	
	51.6 N	170.9 W	
	Fox Islands		
	Aleutian Islands		
	depth about 25 km		
8	Qt	ePZ	03 40 41
8	Qt	ePKPZ	13 01 03

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
	Wr	ePKPZ	04		Qt	ePZ	55 21
		USCGS H 12 41 35		9	Wr	ePZ	22 24 27
		29.9 S 71.8 W			Qt	ePZ	45
		Near coast of Chile		10	Qt	ePZ	08 38 40
		depth about 65 km				USCGS H 08 25 54.6	
8	Lh	ePZ	22 08 53			5.4 S 154.3 E	
	Qt	ePZ	09 16			Solomon Islands region	
		eSN*	19 42			depth about 154 km	
		USCGS H 21 56 44		10	Ch	iPZ	17 34 13
		53.1 N 166.7 W				epPZ	22
		Fox Islands				ePcPN*	35 22
		Aleutian Islands				eSN*	41 41
		depth about 48 km				esSN*	58
8	Lh	ePZ	23 51 18		Lh	iPZ	36 13 c
		iSNE	59 05		Wr	ePZ	32 c
	Wr	iPZ	51 36 d		Qt	ePZ	47 c
		eSZ	59 47			ePPZ	39 22
	Qt	iPZ	51 56 d			eSNEN*	46 31
		eSN*	00 00 21			Mu Sec	
		eSSN*	04 23			PZ 0.3 1.5	
		eSSSN*	07 29			$\Delta = 76^\circ.5$	
		Mu Sec				USCGS H 17 24 58.9	
		PZ 0.9 1.5				4.7 S 138.2 E	
		$\Delta = 63^\circ.8$				New Guinea	
		USCGS H 23 41 32.2				depth about 36 km	
		1.6 N 127.3 E				Mag 6.3 (Qt)	
		Halmahera		11	Qt	ePKPZ	00 48 35
		depth about 102 km				USCGS H 00 29 36.4	
		Mag 6.8 (Qt)				28.8 S 175.9 W	
9	Wr	ePZ	06 54 17			Kermadec Islands	
						depth about 88 km	

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
11	Wr	iPZ	01 19 08 c			ePPZ	51 32
		iXZ	44		Qt	ePZ	52 51
	Qt	ePnZ	11			USCGS H 03 42 50.9	
		ePgZ	21			5.4 N 126.0 E	
		eSnE	57			Talud Islands	
		eSgE	20 12			depth about 124 km	
	Lh	ePZ	19 26	12	Qt	ePZ	06 13 45
		iSNE	20 17			USCGS H 06 01 25.5	
		H 01 18 10				2.9 S 144.9 E	
		Eastern Afghanistan				Near coast of New Guinea	
11	Qt	ePZ	07 16 37			depth about 25 km	
		epPZ	55	12	Ch	ePZ	08 34 49
		esPZ	17 01			epPZ	35 01
		USCGS H 07 03 58.6				USCGS H 08 24 10.0	
		57.5 N 154.1 W				5.6 S 151.9 E	
		Kodiak Island				New Britain	
		depth about 42 km				depth about 41 km	
11	Ch	ePZ	09 40 16	12	Qt	ePZ	17 04 41
		epPZ	37			eXZ	50
		USCGS H 09 28 18		12	Qt	ePZ	19 16 07
		11.6 S 166.3 E				USCGS H 19 07 30.0	
		Santa Cruz Islands				24.4 N 120.2 E	
		depth about 52 km				West coast of Formosa	
11	Lh	ePZ	19 56 55±			depth about 25 km	
	Qt	ePZ	57 38	13	Wr	iPZ	00 11 32
		USCGS H 19 47 12.0				iSZ	12 06
		32.7 N 142.0 E			Lh	ePZ	14
		South of Honshu Japan				eSNE	13 18
		depth about 40 km			Qt	ePZ	12 27
12	Ch	ePZ	03 49 52 c			esPZ	13 02

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSNE			43			Sandwich Islands			
		H 00 10 48						depth about 44 km			
		36¼ N 70 E						Mag 5½—5¾ (Pal)			
		Hindukush				13	Qt	ePKPZ	17	47	00
		depth about 100 km						USCGS H 17 28 21.5			
13	Lh	ePZ	02	31	15			22.0 S 176.9 W			
	Qt	ePZ			56			Tonga Islands region			
		ePcPZ			32 40			depth about 155 km			
		USCGS H 02 21 44.6				14	Qt	ePZ	07	04	30
		6.3 N 126.8 E						e(S)E		03	40
		Off southeast coast of				14	Ch	ePZ	12	39	01
		Mindanao					Qt	ePZ			41 08
		Philippine Islands						USCGS H 12 30 45.3			
		depth about 60 km						33.3 N 142.2 E			
13	Qt	eXZ	05	17	34			South of Honshu, Japan			
		ePKPZ			45			depth about 47 km			
		e(PP)Z			19 25	14	Ch	ePN	22	08	45
		eXZ			21 06			eSN			16 52
		eXNE			24 27		Wr	iPZ			09 18
	Lh	ePKPZ			17 54±		Qt	ePZ			53
	Ch	ePKPZ			18 00			epPZ			10 20
		ePPZ			19 44			eSZ			18 50
		USCGS H 04 59 04.8					Kr	ePZ			10 03
		55.9 S 27.2 W						USCGS H 21 58 57.4			
		Sandwich Islands						51.1 N 159.1 E			
		depth about 67 km						Kamchatka			
		Mag 5¼—5½ (Pal)						depth about 80 km			
13	Qt	ePKPZ	11	05	36	15	Qt	ePZ	09	43	45
		USCGS H 10 46 47.7						e(S)N			45 31
		60.3 S 34.3 W									

8

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
15	Ch	ePZ	17	13	48			Fox Islands			
	Lh	ePZ			16 04±			Aleutian Islands			
	Wr	iPZ			32 c			depth about 47 km			
	Qt	ePZ			33	18	Ch	iPZ	15	32	00 c
		ePcPZ			18 02			iSE			28
		USCGS H 17 07 55.6					Wr	ePZ			36 20
		4.1 S 102.3 E					Qt	ePZ			44±
		Near southwest coast						epPZ			37 03
		of Sumatra						eXZ			41 27
		depth about 66 km						USCGS H 15 31 19.2			
16	Qt	ePKP ₂ Z	12	02	44			23.2 N 94.7 E			
		USCGS H 11 42 56.1						Burma			
		38.3 S 74.4 W						depth about 105 km			
		Off coast of Central				18	Kr	ePKPZ	17	11	30
		Chile						iXZ			34
		depth about 25 km					Qt	ePKP ₂ Z			36
17	Qt	ePZ	11	14	04			ePPZ			15 00
		USCGS H 11 02 32.7						epPPZ			16
		12.1 N 143.4 E					Wr	ePKP ₂ Z			11 42
		South of Guam					Lh	ePKP ₂ Z			44
		depth about 25 km					Ch	ePKP			59
18	Qt	ePKPZ	03	08	54			epPKP			12 35
		iXZ			58			ePKP ₂ Z			13 01
		USCGS H 02 49 59.6						USCGS H 16 52 00.2			
		29.9 S 177.6 W						36.7 S 72.6 W			
		Karmadec Islands						Near coast of			
		depth about 65 km						Southern Chile			
8	Qt	ePZ	10	56	47			depth about 67 km			
		USCGS H 10 44 10.7						Mag 6½ (Pas)			
		53.6 N 165.6 W				18	Qt	ePZ	17	35	37

9

Seismological Bulletin of Pakistan Volume 7 No. 10, October 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
18	Qt	ePZ	17	50	27						
18	Kr	ePKPZ	18	30	03						
	Qt	ePKP ₂ Z			09						
		ePPZ		33	33						
	Wr	eXZ		30	22						
	Lh	ePKPZ			16						
		USCGS H	18	10	30.4						
		36.9 S 73.5 W									
		Near coast of									
		Central Chile									
		depth about 55 km									
18	Qt	ePZ	19	28	14						
18	Qt	ePZ	22	38	23						
19	Qt	ePZ	02	13	37						
19	Qt	ePKP ₂ Z	08	51	07						
		ePPZ		54	29						
		USCGS H	08	31	29.3						
		36.9 S 72.7 W									
		Near coast of									
		Central Chile									
		depth about 61 km									
19	Kr	ePKPZ	11	38	34±						
		ePPZ		41	43						
	Qt	ePKPZ		38	40 c						
		eXZ			59						
		epPKPZ		39	21						
		ePPZ		41	55						
		eXZ		48	23						
	Wr	iPKP ₂ Z			52± c						
	Lh	ePKPZ		38	50						

Seismological Bulletin of Pakistan Volume 7 No. 10, October 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
		eXZ			05							
		USCGS H	19	02	14.5							
		36.7 S 74.2 W										
		Off coast of Central										
		Chile										
		depth about 25 km										
20	Qt	ePZ	22	02	59	23	Kr	ePKPZ	00	27	23	
21	Qt	ePZ	12	01	29		Qt	ePKPZ			28	
		USCGS H	11	43	41.3							
		18.0 S 178.5 W										
		Fiji Islands					Lh	ePKPZ			27 31	
		depth about 549 km					Ch	ePKPZ			38	
21	Ch	ePZ	22	33	28							
		eSN		42	54							
	Qt	ePZ		34	09							
		USCGS H	22	21	52.2							
		51.6 N 176.0 W										
		Andreanof Islands										
		Aleutian Islands										
		depth about 35 km										
22	Ch	eXN	10	08	08	23	Qt	ePKPZ	01	43	21	
		eSKSN		13	40		Wr	ePKPZ			32	
		eSN		14	13							
		ePSN		15	44							
		USCGS H	09	50	43.6							
		19.9 S 172.4 E										
		New Hebrides Islands					23	Qt	ePZ	03	12	28
		depth about 181 km					23	Qt	ePZ	04	39	03
22	Qt	ePZ	22	59	13 d	23	Qt	ePZ	04	43	03	

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Major Shocks

Date	Station	Phase	h	m	s
	Kr	ePZ	43	05	±
	Wr	ePZ	44	04	
		H 04 40 23			
		Southern Iran			
23	Wr	ePZ	06	14	15
	Qt	ePZ			28
		USCGS H 06 03 11.9			
		6.2 S 130.3 E			
		Banda Sea			
		depth about 60 km			
23	Qt	ePZ	10	38	36
23	Ch	ePZ	14	46	59
		eSNEN*			52 55
		eScSE			57 08
	Lh	ePZ	49	16	
		eSE			57 06
	Wr	ePZ	49	39	
	Kr	ePZ			49
		eSZ			58 11
		ePKPPKPZ	15	19	12
	Qt	ePZ	49	57	
		iSNN*			58 21
		eScSNE			59 48
		ePKPPKPZ	19	19	
		Mu Sec			
		PZ 0.2 1.3			
		$\Delta = 62^\circ.7$			
		USCGS H 14 39 33.5			
		3.5 N 126.4 E			
		Molucca Passage			

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Major Shocks

Date	Station	Phase	h	m	s
	Kr	ePZ	40		
	Qt	ePZ	46		
		USCGS H 20 38 23.7			
		3.4 N 126.5 E			
		Molucca Passage			
		depth about 23 km			
	Qt	ePZ	01	29	54 d
		USCGS H 01 19 26.7			
		4.0 S 127.1 E			
		Molucca Passage			
		depth about 25 km			
	Wr	iPZ	05	24	56 c
	Qt	ePZ			57
	Ch	ePZ	07	34	08
	Lh	ePZ			57
		eSE			42 40
	Wr	iPZ	35	01	d
	Qt	ePZ			37 d
		eSN			43 54
		Mu Sec			
		PZ 0.5 1.5			
		$\Delta = 62^\circ.7$			
		USCGS H 07 25 19.9			
		45.0 N 146.4 E			
		Off north coast of			
		Hokkaido, Japan			
		depth about 82 km			
		Mag 6.5 (Qt)			
	Wr	ePZ	14	40	23
	Qt	ePZ	41	25	

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	ePZ	28	32				ePPPE	56	06	
		eXZNE		35				eSNE	01	01	20
		esPZN		48				e!sSN*		25	
		eSE	31	47				eSSN*	06	47	
		e!sSEN*	32	02				iLN*	14	6	
		e!SSN*		21				USCGS H 00 38 20.3			
	Wr	ePZ	29	32				3.1 S 147.4 E			
		USCGS H 16 24 16.3						Bismarck Sea			
		14.4 N 56.7 E						depth about 14 km			
		Gulf of Aden						Mag 6 1/4 (Pas), (Berk)			
		depth about 40 km				26	Qt	ePKP ₂ Z	08	35	41
26	Ch	ePZ	00	48	35		Wr	ePKP ₂ Z		53	
		ipPZEN		40			Lh	ePKP ₂ Z		57	
		iXZEN*	49	02				USCGS H 08 16 03.4			
		ePcPZEN*		22				37.9 S 73.4 W			
		ePPZEN*	50	50				Off coast of Chile			
		ePPPN*	52	20		26	Ch	ePZE	15	32	16 c
		ePcSN*	53	22				epPZ		24	
		iSN*	56	52				esPE		29	
		i!sSN*		59				ePPZE		50	
		iPSN	57	05				ePPPZNE		58	
		iXN*		30				iXZNE	33	51	
		eScSN*	58	28				eSEN*	36	30	
		eSSN*	01	00	45			eXNE		37	
		eLN*		03	3			i!sSN		43	
	Lh	ePZ	00	50	19			eSSNE	37	20	
	Wr	ePS		35	c		Lh	ePZ	34	31	
	Qt	ePZ		51	c			ePPN	36	05	
		epPZNE		57				eSN	40	27	
		eXZ	53	32			Kr	ePZ	34	39 c	

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eLE	44	3				0.1 S 98.6 E			
	Wr	ePZ	35	02				Off West coast of			
	Qt	ePZ		03	c			Sumatra			
		epPZE		11				depth about 87 km			
		eXZNE	26			26	Qt	ePKPZ	17	41	20
		ePPZEN*	36	48				USCGS H 17 22 18.4			
		ePPPZN	37	27				18.0 N 100.0 W			
		ePcSN*	40	53				Guerrero, Mexico			
		eSN*	41	30				depth about 43 km			
		eXE		54		26	Ch	ePZN	19	33	46 c
		eSSEN*	44	35				eXZN		54	
		iLN*	44	9				epPZN*	34	00	
		USCGS H 15 27 02.0						esPZN		07	
		0.4 S 98.6 E						ePPPNN*		34	
		Off west coast of						eSEN*	38	00	
		Sumatra						eXNN*		07	
		depth about 18 km						esSNN*		27	
		Mag 6 (Pas)						eSSNEN*		44	
	Ch	ePZNE	16	10	55		Lh	ePZ		36	02
		eXE		11	03			eSZ		41	51
		epPNE		7			Wr	ePZ		36	31
		eXNE		31			Qt	ePZ		33	c
		ePPZ		40				eXZE		42	
		eSNE	15	13				epPZE		49	
		iXN		19				eXZ		37	58
		esSE		48				ePPZE		38	21
	Wr	ePZ	13	41				e(PPP)E		47	
	Qt	ePZ		41				eSN*		42	55
		epPZ		15	32			eLN*		46	4
		USCGS H 16 05 49.5						USCGS H 19 28 37.3			
								0.3 S 98.5 E			

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Off West Coast of Sumatra					Ch	ePZ	54	01	
		depth about 58 km						epPZ		12	
26	Qt	ePKPZ	22	15	05			ePPPEN	55	55	
		USCGSH	21	56	18.2			ePcPN	56	11	
		6.9 N 73.1 W						eSNN*	59	55	
		Columbia						esSN	11	00	14
		depth about 167 km						USCGS H	10	46	40.2
27	Qt	ePZ	10	39	45			33.7 N 48.5 E			
		USCGSH	10	30	30.1			Iran			
		4.7 S 104.7 E				28	Qt	ePKPZ	15	08	54 c
		Sumatra						eXZ	09	23	
		depth about 26 km					Wr	ePKPZ		05	
28	Ch	ePZ	06	12	46 c		Ch	ePKP ₂ Z		48	
		USCGS H	06	00	33.7			USCGS H	14	49	13.6
		11.6 S 166.4 E						38.7 S 73.3 W			
		Santa Cruz Islands						Near coast of Chile			
		depth about 34 km						depth about 43 km			
28	Qt	ePKPZ	07	05	59	28	Qt	ePZ	22	53	06
		USCGS H	06	48	08.8	28	Ch	ePZE	22	56	46
		18.9 S 178.1 W						ePcPZ		53	
		Fiji Islands						e(S)EN*	23	07	04
		depth about 631 km						USCGS H	22	44	33.6
28	Qt	ePZ	10	50	26			13.9 S 166.0 E			
		ePPZN		39				New Hebrides Islands			
		eSEN*		53	26			depth about 89 km			
		eSSN*		36		29	Qt	ePPZ	09	29	32
		eLN*		54.4				USCGS H	09	12	15.7
	Wr	ePZ		51	03			49.0 N 728.7 W			
	Lh	ePZ		32				Van Couver Islands			
								region			

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		depth about 16 km						Kermadec Islands			
29	Qt	ePZ	18	58	50			depth about 219 km			
29	Qt	ePZ	23	36	32	30	Qt	ePZ	17	59	46
30	Qt	ePKPZ	02	35	05	30	Ch	ePZNE	21	23	57 c
		USCGS H	02	16	32.7			epPZNE		24	08
		42.3 N 126.7 W						ePPZ		25	35
		Off coast of Oregon						ePcSNE		29	31
		depth about 36 km						eSN*		30	33
30	Qt	ePZ	04	58	59			esSNN*		49	
		USCGS H	04	47	59.8			eSSN*		33	50
		50.8 N 158.3 E					Lh	ePZ		25	26
		Off south coast of Kamchatka					Wr	ePZ		37	
		depth about 32 km					Qt	ePZ		26	11 c
30	Qt	ePZ	08	38	27			epPZE		21	
30	Qt	ePZ	08	41	39			ePPNE		28	33
		ePPZ		43	24			ePcSNE		30	53
		eSN*		48	20			eSNE		34	44
		eSSN*		51	31			esSNE		35	00
		eLN*		54.9				eScSNEN*		48	
		Mu Sec						e(SS)N*		38	35
		PZ 0.1 1.0						eLN*		42.5	
		$\Delta = 45.03$						USCGS H	21	15	35.2
		H 08 33 18						28.9 N 141.8 E			
		Atomic Blast						South of Honshu, Japan			
		Mag 5.6 (Qt)						depth about 80 km			
0	Qt	ePZ	16	09	00 c	31	Qt	ePZ	01	55	49
0	Qt	ePKPZ	17	53	39			USCGS H	01	43	53.3
		USCGS H	17	35	03.3			51.9 N 176.1 E			
		28.5 S 178.1 W						Rat Islands			
								Aleutian Islands			
								depth about 35 km			

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Major Shocks

Date	Station	Phase	h	m	s
31	Qt	ePZ	03	28	21
		USCGS H	03	19	28.0
		5.0 S	104.1	E	
		Near coast of			
		Sumatra			
		depth about	27	km	
31	Qt	ePKPZ	04	04	39
		USCGS H	03	46	03.2
		31.2 S	178.3	W	
		Kermadec Islands			
		depth about	232	km	
31	Qt	ePZ	19	25	54
31	Qt	iPgZ	19	43	22.9 d
		iSgNE			35.9
	Wr	ePnZ	44	25	4
		H	19	43	02.9
		Pak-Afghan border			
31	Qt	ePZ	20	37	18

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
	Quetta								
1	ePZ	00	42	23	4	eSgNE			27
	eSN			49		ePZ	19	21	32
1	ePZ	07	02	41	4	eSNE			56
	eSE			03 10		ePZ	19	45	19
1	eXZ	08	26	.0	4	eSNE			43
1	ePZ	20	18	43	4	ePZ	19	48	36
	eSNE			19 09		eSNE			49 00
1	eXE	22	53	.0	5	ePZ	00	34	12
2	eXE	01	22	.0		eSNE			35
2	ePZ	05	34	22	5	ePZ	01	24	50
2	eXZ	07	39	09		eSNE			25 12
2	ePZ	18	23	24±	5	ePZ	04	05	20±
3	ePZ	00	07	51		e(S)N			46
	eSN			09 14	5	eXN	11	36	.0
3	ePgZ	01	14	48	6	ePZ	03	29	57
	eSgN			59	6	ePZ	07	13	29
3	ePgZ	09	39	34		eSNE			53
	eSgN			47	6	ePZ	08	04	44
3	ePgZ	09	54	53		eSNE			05 08
	eSgN			55 08	6	eXE	10	06	07
3	ePZ	16	01	17±	7	ePZ	00	00	49
	e(S)NE			51	7	eXN	11	40	.0
4	eXZ	02	41	34	7	ePZ	12	20	48
4	eXZ	08	42	04		eSNE			21 19
4	ePZ	09	34	40	7	eXZ	16	18	21
	eSNE			35 06		e(SN)			20 34
4	ePgZ	17	26	11	7	ePZ	18	21	21
						eSNE			44

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
7	ePZ	21 55 43	11	eXE	15 28 01
	eSNE	56 07	11	ePZ	19 34 11
8	eXE	04 59.0		eSNE	35 31
8	eXZ	09 07.0	11	ePgZ	20 58 28
8	eXZ	09 36 10		eSgNE	31
8	ePZ	10 45 28	12	eXN	11 30 03
8	ePZ	11 46 16	12	ePN	14 50 02
8	ePZ	18 08 37		eSN	41
	e(S)N	09 54	12	ePZ	19 30 03
8	ePgE	23 16 04		eSN	53
	eSgE	10	13	ePZ	05 41 24
9	ePgZ	03 54 12		eSE	42 02
	eSgNE	22	13	ePgE	11 41 21
9	eXZE	10 07.3		eSgE	27
9	ePgZ	13 48 13	13	eXZ	14 40 42
	eSgNE	19	13	ePZ	15 43 57
9	ePZ	20 59 08		eSE	45 20
	eSNE	23	13	ePZ	16 49 25
9	ePZ	21 27 26		eSNE	51 43
	e(S)NE	29 27	13	ePZ	18 55 30
9	ePZ	21 43 54		eSE	52
	eXZ	22 15 34	13	ePZ	23 38 36
10	ePgZ	09 49 27		eSE	39 55
	eSgN	29	14	ePZ	06 30 26
11	ePZ	02 24 38		eSE	48
	eSNE	57	14	ePZ	07 17 53
11	ePZ	12 04 00		eSNE	18 16
	eSNE	40	14	eXE	07 23 33

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	eSgNE	43	16	ePZ	19 59 21
14	ePZ	09 13 02		eSN	20 00 48
	eSNE	14 15	17	ePZ	03 28 17±
14	eXZ	09 28.0	17	ePgZ	04 41 16
14	eXN	11 01 47		eSgNE	28
14	ePZ	14 55 05	17	ePgZ	17 44 11d
	eSNE	27		eSgN	26
14	ePZ	15 39 34	17	ePZ	18 11 18
	eSNE	40 51		e(S)N	51
14	eXZ	16 29.0	19	ePZ	19 06 07
14	ePZ	17 46 11		eSN	30
	eSNE	32	19	ePgZ	22 28 37
14	ePZ	18 02 00		eSgN	44
	eSNE	21	20	ePZ	01 57 45
14	eXZ	18 20 04		eSN	59 05
14	ePZ	19 47 24	20	ePgN	02 21 05
14	ePZ	21 58 25		eSgN	09
	eSN	41	20	ePZ	06 13 20
15	ePZ	08 11 59		eSN	34
	eSE	12 33	20	ePZ	10 47 35
15	eXZ	10 36 24	20	e(P)Z	14 32 28
15	ePZ	18 32 11	20	ePZ	22 40 10
	eSNE	33 38		eSN	34
16	eXE	17 01.2	21	eXZ	04 19 50
16	ePgZ	17 35 41	21	ePgZ	07 27 31
	eSgN	44		eSgE	39
16	ePgZ	18 48 06	21	ePgZ	07 38 13
	eSgNE	21		eSgN	21

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Date	Phase	h m s
21	ePgZ	07 40 47 c
	iSgNE	54
21	ePgZ	16 08 58
	eSgN	09 04
21	ePgZ	16 20 53
	eSgN	21 00
21	ePgZ	17 15 54
	eSgN	56
21	ePZ	17 24 24
	eSN	43
21	ePgZ	17 49 12
	eSgN	17
21	ePZ	20 58 39 d
	iSNE	59 03
21	e(P)Z	22 41 51
22	eXZ	03 04.0
22	ePZ	07 33 05
	eSNE	28
22	ePgZ	17 51 39
	eSgN	40
22	ePZ	18 13 50
	eSN	14 19
22	ePZ	19 11 35
23	ePZ	01 21 03
23	eXZ	03 54.0
23	eXN	04 13 39
	eSN	14 56
23	ePZ	04 47 30 ±

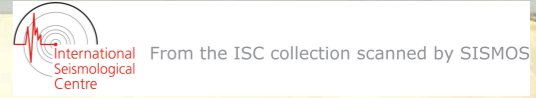
Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Date	Phase	h m s
23	eXZ	15 09 52
23	eXZ	15 59.0
23	ePgZ	23 09 11
	iSgN	18
24	eXZ	06 31 54
24	ePZ	11 42 49
	eSNE	44 17
24	ePgZ	17 39 53
	eSgN	40.00
25	ePZ	12 46 43
	eSN	55
25	ePgZ	11 30 54
	eSgN	31 08
25	ePZ	16 25 38
26	ePgZ	08 40 47
	iSgNE	59
26	ePZ	16 25 05
26	ePgZ	19 49 01
	eSgNE	09
27	eXZ	06 22 48
	e(S)N	58
27	eXZ	10 17 43
28	eXE	05 01 35
	eSE	57
28	ePgE	13 07 17 ±
	eSgE	19
28	ePgZ	16 16 24
	eSgNE	33

Date	Phase	h m s
8	ePgZ	16 36 03
	iSgNE	14
8	ePgZ	16 43 49
	eSgN	58
8	ePgZ	18 27 21
	eSgNE	32
8	ePgZ	20 28 41
	eSgNE	50
9	ePgZ	03 40 21
	eSgNE	29
9	ePZ	04 08 52 ±
	eSNE	10 15
9	ePgZ	04 18 30
	eSgNE	38
9	ePgZ	15 08 15 ±
	eSgE	28
9	ePZ	18 01 12
	eSN	30
0	eXZ	02 42 24
0	ePZ	03 44 23 ±
0	ePZ	06 20 13 ±
0	ePZ	06 25 34 ±
0	ePZ	06 46 53
	e(S)N	47 30
0	eXZ	08 11.0
0	ePgN	13 57 23
	eSgNE	31
0	ePZ	16 31 55

Minor Shocks

Date	Phase	h m s
31	ePZ	07 38 48
	eSNE	39 58
31	ePN*	08 30.0
	Warsak	
1	ePN	00 06 01
2	ePN	01 19 44
	eSN	20 16
2	ePN	02 17 49
	eSN	18 25
2	ePZ	11 06 49
3	ePZ	00 06 47
3	iPZ	07 47 29
	iSZ	48 18
3	iPZ	09 09 35 c
	iSZ	10 10
4	iPZ	04 31 52 c
	iSZ	32 26
4	ePZ	11 43 15
4	iPZ	15 26 31 c
4	ePZ	19 22 15
4	iPZ	19 27 00
4	iPZ	23 14 53
5	ePZ	05 14 14
5	iPZ	07 01 14
5	ePZ	13 38 58
	eSZ	39 27
5	ePZ	13 52 01
5	iPZ	13 59 10 c



Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Date	Phase	h m s
5	ePZ	20 01 01
5	ePZ	22 59 03
6	iPZ	01 17 17 c
8	iPZ	04 58 00 c
	iSZ	28
8	iPZ	10 28 16 c
	iSZ	47
8	iPZ	18 07 37 d
9	ePZ	02 41 39
9	ePZ	22 12 18
9	iPZ	22 24 27 d
10	ePZ	07 35 59
10	iPZ	07 56 08 c
11	iPZ	10 27 52 c
	iSZ	28 30
11	iPZ	15 25 32 c
	eSZ	26 06
12	iPgZ	07 00 59 d
	iSgZ	01 11
12	ePZ	16 43 55
	iSZ	44 24
13	ePgZ	05 27 08
	iSgZ	10
13	ePZ	15 42 54
13	ePZ	16 48 46
13	iPZ	23 37 37
	iSZ	38 09
14	iPZ	09 12 19 d

Minor Shocks

Date	Phase	h m s
14	iPZ	15 38 38 d
	iPZ	39 12
14	iPZ	16 28 49 d
	iSZ	29 21
14	iPZ	18 17 45 d
	iSZ	18 16
15	ePZ	13 46 01
	iSZ	24
15	iPZ	18 31 06 c
	iSZ	43
16	ePZ	02 18 23
	iSZ	49
16	ePZ	07 03 20
16	ePZ	12 52 25
16	ePZ	14 09 05
	eSZ	29
16	ePZ	19 57 53
17	iPZ	07 01 36 c
	iSZ	02 10
17	ePZ	09 07 26
17	ePZ	18 02 55
17	ePZ	18 11 19
17	ePZ	20 24 14
18	ePZ	01 20 57
18	ePZ	23 12 53
18	ePZ	23 55 24
19	iPZ	07 39 35 c
19	ePZ	07 46 55

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Date	Phase	h m s
19	ePgZ	17 42 11
	eSgZ	15
19	iPZ	21 51 40 d
	iSZ	52 16
20	iPZ	01 56 35 d
	iSZ	57 07
20	ePZ	07 22 54
	eSZ	23 43
20	iPgZ	10 49 03 d
	iSgZ	04
20	iPZ	16 42 39 c
20	ePZ	17 51 33
10	ePgZ	22 28 22
	eSgZ	30
21	ePZ	06 37 56
	iSZ	38 14
21	ePZ	18 02 01
21	iPZ	21 59 22 d
21	iPZ	22 40 51 c
	iSZ	41 30
22	iPZ	03 36 07 c
	iSZ	24
22	eSZ	06 12 51
	iSZ	13 13
22	ePZ	09 46 37
23	ePZ	03 52 16
24	ePZ	04 48 04
24	ePZ	06 05 43
24	ePZ	07 42 38

Minor Shocks

Date	Phase	h m s
	iSZ	43 12
24	iPZ	11 41 49 d
	iSZ	42 28
25	ePZ	00 52 47
25	ePZ	08 55 09
25	iPZ	22 55 09 c
25	iPZ	22 55 09 c
	iSZ	56 35
26	iPZ	04 19 56
	iSZ	20 20
26	iPZ	18 07 59 d
26	ePZ	16 04 55
	eSZ	05 22
27	ePZ	11 50 06
28	ePZ	01 04 00
28	ePZ	16 13 51
	iSZ	14 16
29	iPZ	00 00 24 c
	iSZ	51 ±
29	iPZ	14 07 54 d
30	ePZ	02 41 35
	iSZ	42 05
30	ePZ	06 46 51
30	ePZ	08 25 56
	iSZ	26 25
31	iPZ	07 37 57 c
31	iPZ	13 42 17 d

Seismological Bulletin of Pakistan
Volume 7 No. 10, October 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	Lahore			eSZ	34
1	ePZ	03 11 57	25	ePZ	07 30 29
2	ePZ	19 09 03		eSE	48
8	ePZ	18 08 24	25	ePZ	07 27 49
9	ePZ	22 33 07		eSZ	28 14
14	eXZ	15 44 04		Chittagong	
15	eXZ	15 40 24	2	eXZ	22 01 25
20	eXZ	01 58 19	2	eXZ	22 24.0
24	ePZ	09 14 08	3	e(P)Z	08 51 20
24	ePZ	16 29 29	5	ePZ	11 06 50
25	eP	00 50 19	9	ePZN	17 28 52
28	eXZ	21 37 14		eSNE	29 10
	Karachi		11	ePZNE	09 35 00
2	eXZ	12 00 42	16	ePNE	06 40 44
6	eXZ	07 10 09	16	eXN	18 28.0
	eSE	45	16	eXN	23 26.0
10	e(P)Z	17 35 25	18	ePZ	20 28 13
11	ePZ	09 23 16		eSNE	46
	e(S)Z	24 13	20	eXZ	09 21 48
11	eXZ	09 28 44	20	ePZ	09 52 47
11	ePZ	12 03 01		eSNE	53 17
	e(S)Z	43	20	ePZ	10 43 42
14	eXZ	22 55 49		eSNE	44 35
15	e(P)Z	00 31 33	20	eX(L)N	17 51 15
	iSE	39		eS(L)N	53 56
19	eXZ	12 22 10	22	eXZ	07 45 01
	eSZ	25	23	eX(L)N	09 07 39
19	eXZ	12 32 38	23	eX(L)N	09 19 39
	eZS	05		eX(L)N	09 27 41
19	eXZ	12 27 22	23	eX(L)N	09 33 05

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Pakistan Meteorological Service

Director,
 Meteorological Service
 Deputy Director,
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 Officer Incharge,
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Vol. 7 November 1961 No. 11

CONTENTS

1.	Particulars of Stations and Instruments ...	1
2.	Major shocks ...	3
3.	Local and Minor shocks ...	18

Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
<u>Quetta (Central Station)</u>				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Contd.)

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore				
Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi				
Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong				
Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak				
Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki), (Pal) stand for seismological observatories Pasadena (U.S.A.),
 Berkley (U.S.A.), Uppsala (Sweden), Kiruna (Sweden) & Palisade (U.S.A.) respectively.
 All times are in Greenwich Mean Time.

Siesmological Bulletin of Pakistan
 Volume 7 No. 11, November 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
1	Qt	ePZ	00	09	17	4	Qt	ePZ	03	49	24
2	Wr	ePnN	07	00	12			USCGS H	03	38	30.1
	Qt	ePnZ			51			50.0 N	155.5 E		
		ePgZE			01 07			Kurile Islands			
		eSnNE			44			depth about 32 km			
		eSgE			02 11	4	Wr	iPZ	13	09	03
	Lh	ePnZ			00 57		Qt	ePZ			54 c
		H 06 59 41						e(S)NEN*			13 57
		34 N 69 1/4 E						eLN*			15.6
		Eastern Afghanistan						Mu Sec			
2	Lh	ePZ	15	48	20			PZ 0.5 1.8			
	Qt	ePZ			49 01			Δ = 21°.8			
2	Ch	ePZ	23	48	07			Eastern Tibet			
		ePcPZE			15			depth about 25 km			
		eSNN*			58 13			Mag 5.7 (Qt)			
	Lh	ePZ			48 08						
	Qt	ePZ			31	4	Wr	ePZ	18	29	06
		USCGS H	23	38	50.7		Qt	ePZ			35
		54.5 N 162.3 W						ePPZ			32 51
		Alaska Peninsula						eSNEN*			40 05
		depth about 40 km				5	Qt	ePZ	03	25	50
3	Qt	ePZ	01	38	53			USCGS H	03	15	44.6
4	Wr	ePZ	03	15	42			36.6 N 140.9 E			
	Qt	ePZ			59			Honshu Japan			
		eSNEN*			25 29			depth about 60 km			
		USCGS H	03	04	21.2	5	Qt	ePZ	03	52	16
		2.9 S 137.2 E						USCGS H	03	41	40.0
		Near north cost of						44.2 N 148.4 E			
		New Guinea						Kurile Islands			
		depth about 51 km						depth about 18 km			

Seismological Bulletin of Pakistan
Volume 7 No. 11, November 1961

Major Shocks			
Date	Station	Phase	h m s
5	Qt	ePZ	08 39 03
		eSNE	41 00
	USCGS H	08 36 35.4	
		28.7 N 55.1 E	
		Southern Iran	
		depth about 92 km	
5	Qt	ePZ	08 44 31
	Wr	ePZ	45 05
5	Ch	ePZN	10 45 33 d
		epPZ	46 05
		eSE	53 35
	Qt	ePZ	46 57
	Kr	ePZ	47 19
	USCGS H	10 36 39.5	
		45.7 N 147.9 E	
		Kurile Islands	
		depth about 142 km	
6	Wr	ePZ	08 03 28
	Qt	ePZ	04 00
		eSNE	07 58
	USCGS H	07 59 06.2	
		26.7 N 91.9 E	
		Bhutan	
		depth about 67 km	
6	Wr	iPZ	12 29 45 d
	Lh	ePZ	30 25
	Qt	ePZ	55 d
		esPZN	31 32
		eSNEN*	32 29
	Kr	ePZ	31 58 d

Major Shocks

Seismological Bulletin of Pakistan
Volume No. 11, November 1961

Major Shocks			
Date	Station	Phase	h m s
		eSE	34 19
		H 12 28 55	
		36 $\frac{1}{2}$ N 73 $\frac{1}{2}$ E	
		Hindukush	
		depth about 125 km	
	USCGS H	12 29 00.5	
		36.5 N 73.3 E	
		Hindukush	
		depth about 114 km	
6	Qt	ePZ	13 22 24
	USCGS H	13 09 50.1	
		6.0 S 146.9 E	
		New Britain	
		depth about 25 km	
6	Qt	ePZ	13 46 41
	USCGS H	13 34 54.8	
		17.5 N 145.3 E	
		Mariana Islands	
		depth about 251 km	
7	Lh	ePZ	01 21 58
	Qt	ePZ	22 43
		epPZ	54
	USCGS H	01 12 55.7	
		11.6 N 126.1 E	
		Summar Philippine Islands	
		depth about 47 km	
7	Qt	ePZ	08 42 15 d
		eSNE	44 15
	Wr	ePZ	43 17
		H 08 39 40	
		Southern Iran	
7	Qt	ePZ	11 05 17
7	Qt	ePKPZ	12 34 03
	USCGS H	12 15 03.6	
		26.9 S 176.3 W	
		South of Tonga Islands	
		depth about 54 km	
7	Qt	ePKPZ	21 28 40
	USCGS H	21 09 47.4	
		34.3 S 179.2 W	
		South of Kermadec Islands	
		depth about 39 km	
8	Qt	ePZ	05 34 31
8	Qt	ePZ	13 02 20
8	Qt	ePZ	17 02 11
	Lh	ePZ	27
8	Qt	ePZ	19 40 16
	USCGS H	19 28 39.9	
		3.9 S 136.2 E	
		New Guinea	
		depth about 54 km	
9	Qt	ePKPZ	04 39 02
	Wr	ePKPZ	04
	Lh	ePKPZ	13
	USCGS H	04 19 42.0	
		22.9 S 67.9 W	
		Northern Chile	
		Argentina border	
		depth about 84 km	
		Mag 6 $\frac{1}{4}$ (Pas)	
9	Qt	ePZ	16 14 01
9	Lh	ePZ	17 08 17
		eSNE	46
	Wr	iPZ	40
		iSZ	09 27
	Qt	ePZ	37
		eSNE	11 07
		H 17 07 37	
		33 $\frac{1}{4}$ N 76 $\frac{1}{2}$ E	
		Himalaya Range	
		depth about 100 km	
9	Lh	ePZ	18 47 44 c
	Wr	ePZ	48 04 c
	Qt	ePZ	19 c
	USCGS H	18 37 11.8	
		5.9 S 129.8 E	
		Banda Sea	
		depth about 87 km	
10	Qt	ePKPZ	02 26 59
		epPKPZ	27 23
		ePPZ	30 25
	USCGS H	02 07 34.7	
		14.3 S 71.9 W	
		Southern Peru	
		depth about 68 km	
10	Qt	ePZ	07 41 41
	USCGS H	07 30 00.6	
		2.5 S 138.3 E	
		Near north coast of	

Seismological Bulletin of Pakistan
Volume 7 No. 11, November 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		New Guinea depth about 52 km				11	Qt	ePnZ	10	47	50 c
10	Wr	ePZ	08	17	43			ePgN			54
	Lh	ePZ		18	23		Wr	eSnNEN*		48	14
	Qt	ePZ			42			ePZ		49	02
		eSNE		20	27			H 10 47 17			
		H 08 16 26						Eastern Afghanistan			
		38½ N 70½ E				11	Qt	ePKPZ	12	46	15
		Afghanistan—Tadzhikistan border						ePKSN*		49	44
10	Kr	ePZ	13	57	05			USCGS H 12 27 03.8			
	Qt	ePZ			41			13.2 N 91.0 W			
		e(S) N*		14	01 58			Off coast of Guatemala			
10	Qt	ePKPZ	18	18	39			depth about 94 km			
		epPKPZ			20 08	11	Qt	ePZ	17	55	06
		USCGS H 18 00 49.6						USCGS H 17 42 36.4			
		17.5 S 178.8 W						52.7 N 169.3 W			
		Fiji Islands						Fox Islands			
		depth about 586 km						Aleutian Islands			
10	Qt	ePZ	20	51	32			depth about 51 km			
		iSNEN*			52 00	12	Qt	ePZ	02	23	42 d
	Kr	ePZ			41			eXN*			29 00
		eSE		53	53			eSN*			30 30
		H 20 50 54						eSN*			30 30
		Eastern Afghanistan						eLN*			34.3
11	Qt	ePZ	08	59	16		Wr	ePZ	24	22	d
		USCGS H 08 47 33.9					Lh	ePZ			28
		2.3 S 138.2 E						USCGS H 02 15 16.7			
		New Guinea						0.8 N 29.5 E			
		depth about 54 km						Congo region			
								depth about 39 km			
						12	Qt	ePZ	08	29	39

Seismological Bulletin of Pakistan
Volume 7 No. 11, November 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSN*		36	30			35½ N 70½ E			
		eSSN*		40	02			Hindukush			
		eLN*		43.6				depth about 150 km			
		USCGS H 08 21 06.8						USCGS H 09 12 14.6			
		16.9 S 66.9 E						35.7 N 70.4 E			
		Mascarene Islands						Hindukush			
		depth about 34 km						depth about 157 km			
12	Lh	ePZ	18	48	16	13	Ch	ePZ	19	47	53 c
	Qt	ePZ			53		Lh	ePZ			48 31
		USCGS H 18 38 33.7					Qt	ePZ			49 09 c
		0.1 N 126.1 E						USCGS H 19 38 15.5			
		Molucca Passage						46.8 N 153.9 E			
		depth about 165 km						Kurile Islands			
13	Ch	ePZ	07	48	55			depth about 39 km			
		epPZ			49 02	14	Qt	ePKPZ	05	01	44
	Qt	ePZ			51 32			ePPE			04 30
		epPZ			43			ePKSZE			05 17
		eSN*		08	01 04			eXN*			24
		esSN*			18			e!SSN*			21 52
		USCGS H 07 39 53.0					Ch	ePKPZ	02	22	
		3.8 S 136.3 E						ePKP ₂ Z			55
		Near north cost of						USCGS H 04 42 26.5			
		New Guinea						7.3 N 82.4 W			
		depth about 34 km						Off coast of Panama			
13	Wr	ePZ	09	12	47			depth about 29 km			
	Lh	ePZ			13 32			Mag 6½ (Pas), 6 (Berk)			
	Qt	ePZ			45 d	14	Qt	ePZ	07	09	53
		iSNE			14 57	14	Qt	ePZ			10 12 19 c
		H 09 12 42						USCGS H 10 02 32.7			
								36.1 N 139.0 E			

Seismological Bulletin of Pakistan
Volume 7 No. 11, November 1961

Date	Station	Phase	h	m	s
14	Qt	Honshu, Japan depth about 167 km	10	39	27
		USCGS H 10 28 33.4			
		47.0 N 153.7 E			
14	Qt	Kurile Islands depth about 26 km	13	30	21
		USCGS H 13 11 14.1			
		19.5 S 69.6 W			
14	Ch	Northern Chile depth about 121 km	17	20	12 c
		ePZ			
		eXZ		55	
		ePPZ	21	04	
		ePPPZ		24	
		ePcPZ	23	14	
		eSN	25	09	
		ePcSZ	26	51	
		iScSZN	30	47	
		Lh	22	32	
Wr	23	00 c			
Qt	ePZ		02 c		
	eSNEN*	30	07		
14	Qt	USCGS H 17 14 00.1			
		5.7 S 104.3 E			
		Near coast of Sumatra depth about 16 km	22	37	33
14	Qt	USCGS H 22 26 47.9			

Major Shocks				
Date	Station	Phase	h	m s
15	Ch	44.2 N 147.6 E Kurile Islands depth about 25 km	04	28 58
		ePZ		
		epPZ	29	26
15	Qt	ePPZ	30	03
		ePZ	31	45
		USCGS H 04 22 51.9		
15	Ch	4.1 S 105.0 E Sumatra depth about 126 km	07	25 54 c
		i!PZN		
		ipPZ	26	05
		iXZ	27	06
		iPcPZ		18
		i!PPZ		49
		iPPPZN	28	38
		iPcSZ	31	12
		eSZN	32	49
		isSZN	33	03
15	Ch	iPPSZN		08
		e(PKPPKP)ZN	56	56
		Mu Sec		
15	Ch	PZ 5.2 1.6		
		$\Delta = 48^\circ.6$		
		Lh	07	26 49 c
15	Wr	eSNE	34	34
		iPZ	26	54
15	Qt	iPZ	27	31 c
		epPZ		34

Seismological Bulletin of Pakistan
Volume 7 No. 11, November 1961

Major Shocks

Date	Station	Phase	h	m	s
15	Ch	iPcPZNE	28	12	
		ePPZNE	29	46	
		ePcSZEN*	31	20	
		i!SZNE	35	52	
		esSE	36	09	
		ePSN		12	
		ePPSNN*		20	
		iScSN*	37	04	
		iSSN*	39	52	
		iXN*	41	36	
		iLN*	43.	4	
		ePKPPKPZ	56	42	
		Mu Sec			
		PZ 5.0 2.0			
		PN 2.8 2.0			
PE 2.9 2.0					
15	Kr	$\Delta = 62^\circ.0$			
		i!PZ	07	27 50	
		ipPZ		28 00	
		Mu Sec			
		PZ 6.1 1.8			
		$\Delta = 65^\circ.0$			
		USCGS H 07 17 12.4			
		43.1 N 145.1 E			
		Near coast of Hokkaido, Japan depth about 43 km			
		Mag 7.3 (Ch), 7.4(Qt), 7.5 (Kr)			
15	Ch	ePZN	19	20 30 d	

Date	Station	Phase	h	m	s
16	Ch	ePPZ			39
		esPZ			21 01
		iSN			51
		Lh			45
		Wr			22 21
		Qt			23 07
					22
					26 38
					H 19 18 46
					29 N 89 E
16	Ch	Eastern Tibet depth about 100 km			
		ePZ	16	17 05	
		ePPZ		21 00	
		USCGS H 16 03 54.8			
		20.2 S 172.9 E			
		Loyalty Islands region depth about 32 km			
		ePZN	17	24 35	
		eSZN		25 40	
		Qt		28 03	
					H 17 23 11
16	Qt	Bhutan-Tibet border			
		ePZ	23	40 36	
		ePZ	15	00 54	
17	Lh	ePZ		01 06	
		Qt		31	
17	Ch	USCGS H 14 49 03.0			
		52.4 N 170.7 W			

Seismological Bulletin of Pakistan
Volume 7 No. 11, November 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Fox Islands						ePPZN	11	58	
		Aleutian Islands						ePcPZ	12	20	
		depth about 27 km						ePPPZ		26	
17	Qt	ePZ	15	05	21			eSN	16	29	
17	Qt	ePKPZ	19	22	30	Kr		ePZ	13	05	
		USCGS H 19 03 55.4				Qt		ePZ	15	00	
		19.6 S 175.5 W						epPZE	25		
		Tonga Islands region						esPZE	30		
		depth about 220 km						iSNEN*	21	50	
17	Qt	ePZ	22	50	25			ePPSN*	22	21	
18	Lh	ePnZ	01	43	29			eIXN	23	46	
		eSnN			46			eSSN*	26	07	
	Wr	ePZ			45			eLN*	29	3	
	Qt	ePZ	44	39				USCGS H 06 02 34.3			
		eSNE	45	52				0.9 S 126.9 E			
		H 01 43 04						Halmahera region			
		32½ N 73½ E						depth about 38 km			
		West Pakistan				18	Qt	ePKPZ	11	35	54 c
		USCGS H 01 43 07.7						USCGS H 11 16 56.8			
		32.6 N 73.6 E						27.0 S 176.3 W			
		West Pakistan						Kermadec Islands region			
		depth about 56 km						depth about 85 km			
18	Ch	ePnZ	01	52	38	18	Ch	iPZ	22	15	39 c
		eP*Z			48			ipPZ			58
		ePgZN			58			ePPZ	16	31	
		eSnN	53	34				ePPZ			50
		eS*ZN	47					e!ScSZ	26	18	
	Qt	ePZ	56	45				Mu Sec			
18	Ch	ePZ	06	10	19			PZ 1.0 1.5			
		epPZ			35			$\Delta = 28^\circ.2$			

Seismological Bulletin of Pakistan
Volume 7 No. 11, November 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Lh	ePZ	22	17	44			USCGS H 08 05 07.4			
		eSN			24 02			4.3 S 101.7 W			
	Wr	ePZ	18	05	c			West of Galapagos Islands			
	Qt	ePZ			36 c			depth about 25 km			
		epPZ			52	19	Qt	ePZ	10	25	53
		ePPZ	20	28				epPZ			26 09
		eSNEN*	25	34				USCGS H 10 12 51.2			
		esSN*	26	02				7.0 S 154.8 E			
		eSSN*	29	8				Solomon Islands			
		iXN*			46			depth about 85 km			
		Mu Sec				19	Ch	iPZ	23	29	03 c
		PZ 0.6 1.7						epPZ			42
		$\Delta = 49^\circ.1$						ePPZ			30 39
	Kr	ePZ	22	18	41			ePPPZ			31 01
		Mu Sec						ePcPZN			16
		PZ 0.4 1.3						iXN			32 14
		$\Delta = 49^\circ.8$						iSZN			34 44
		USCGS H 22 09 53.4						esSZ			35 44
		23.7 N 121.8 E						i!ScSN			38 50
		Near coast of Formosa						Lh ePZ			31 21 c
		depth about 60 km						epPZ			32 05
		Mag 6.3 (Qt, Kr, Ch)						eSN			38 53
19	Qt	ePZ	00	47	22			Wr ePZ			31 43
		USCGS H 00 35 14.1						Kr ePZ			46
		51.6 N 178.5 W						iXZ			49
		Andreanof Islands						epPZ			32 32
		Aleutian Islands						Qt ePZ			31 58
		depth about 68 km						epPZE			32 46
19	Qt	ePKPZ	08	25	17			esPN			55

Seismological Bulletin of Pakistan
Volume 7 No. 11, November 1961

Major Shocks

Date	Station	Phase	h	m	s
		ePPZN	34	07	
		ePPPZN*	35	50	
		eSNEN*	40	02	
		ePSE	41		
		ePPSN	58		
		esSN*	41	03	
		eScSNEN*	31		
		eLN*	47.3		
		ePKPPKPZ	00	01	02
		USCGS H	23	21	55.5
		0.8 N	124.3	E	
		Northern Celebes			
		depth about	157	km	
20	Lh	ePZ	04	09	04
	Qt	ePZ			45
	Ch	ePZ			50
		USCGS H	04	03	55.7
		50.9 N	92.5	E	
		Outer Mongolia-Siberia			
		border			
		depth about	53	km	
20	Ch	ePZ	11	57	09
		eSKSN	12	07	39
		eSN			54
		ePSN	09	00	
		ePPSN	29		
	Qt	ePPZ	03	44	
		eSKSN*	09	29	
		eSKKN*	10	37	

Date	Station	Phase	h	m	s
		e!SN*	11	21	
		eSKSPN*	13	38	
		USCGS H	11	44	19.4
		21.8 S	169.9	E	
		Loyalty Islands region			
		depth about	33	km	
20	Qt	ePZ	18	11	08
		epPZNE			16
		eSKSN	21	23	
		eSKKSN	41		
		eSEN	43		
		e!sSNEN*	22	04	
		eSSN*	27	40	
	Kr	ePZ	11	21	
	Lh	ePZ			28
	Ch	e(PKP)Z	16	28	
		ePPZ	17	23	
		eSKSZN	23	11	
		ePSN	26	51	
		ePPSN	27	44	
		USCGS H	17	58	17.5
		31.3 N	40.9	W	
		North Atlantic Ocean			
		depth about	44	km	
20	Qt	ePZ	19	20	19
		USCGS H	19	08	06.6
		5.0 S	144.4	E	
		New Guinea			
		depth about	65	km	

Seismological Bulletin of Pakistan
Volume 7 No. 11, November 1961

Major Shocks

Date	Station	Phase	h	m	s
20	Ch	iPZ	23	15	00 d
		epPZ			16 43
		eSN	20	41	
	Lh	ePZ			16 34
	Qt	ePZ			17 17 d
		USCGS H	23	07	47.5
		28.3 N	138.9	E	
		South of Honshu, Japan			
		depth about	525	km	
21	Qt	ePZ	07	14	21
		e(S)N*			21 55
	Ch	ePZ			14 23
	Lh	ePZ			40
	Wr	ePZ			54
21	Ch	ePZ	11	13	39
		epPZN			58
		ePPZ			15 07
		e(S)N			19 04
		esSN			54
		eScSN			23 42
	Lh	ePZ			16 02
		eSE			23 37
	Wr	ePZ			16 25
	Kr	ePZ			28
	Qt	ePZ			38
		epPZ			58
		ePoPZ			17 30
		eSNEN*			24 45
		esSN*			25 25

Date	Station	Phase	h	m	s
		USCGS H	11	06	38.1
		0.9 N	122.5	E	
		Northern Celebes			
		depth about	85	km	
21	Ch	ePZ	18	12	50
		epPZ			14 29
	Qt	ePZ			12 58 d
		epPZ			13 10
		epPZ			14 40
		eSN*			19 31
		esSN*			49
	Lh	ePZ			13 16
	Wr	ePZ			30
		USCGS H	18	04	50.9
		13.4 S	66.1	E	
		Indian Ocean			
		depth about	25	km	
22	Ch	ePZ	11	19	26
		epPZ			38
		eSKSN			29 52
		eSN			30 04
		ePSN			31 04
		USCGS H	11	06	40.5
		21.5 S	169.8	E	
		Loyalty Islands			
		depth about	41	km	
22	Qt	ePKPZ	13	21	02
	Ch	ePKPZ			32

Seismological Bulletin of Pakistan
Volume No. 11, November 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 13 01 40.1						esSN			37
		2.7 N 84.8 W						eScSN			32 00
		South of Panama					Lh	ePZ			24 07
		depth about 37 km					Qt	ePZ			20
22	Qt	ePZ	21	59	01			epPZ			46
22	Lh	ePZ	22	39	53			USCGS H 14 11 23.2			
	Qt	ePZE	40	21				6.3 S 154.8 E			
		USCGS H 22 30 52.1						Solomon Islands			
		8.8 S 110.5 E						depth about 83 km			
		Near South coast of Java				25	Ch	ePZ	16	03	09
		depth about 188 km						epPZ			29
23	Qt	ePZ	16	42	56			esPZ			48
23	Kr	ePnZ	21	29	11			eSN			10 58
		eSnE	41				Wr	ePZ	03	45	
	Qt	ePnZ	20				Qt	ePZ	04	32	
		ePgZNE	32			25	Ch	ePZ	20	28	02
		eSnNE	30	03			Lh	ePZ	29	19	
		eSE*	08				Wr	ePZ	27		
		eSgNE	20				Qt	ePZ	30	03	
		H 21 28 31						Mu Sec			
		Eastern Baluchistan						PZ 0.2 1.5			
		West Pakistan						USCGS H 20 19 50.7			
24	Qt	ePZ	08	03	18			36.4 N 141.4 E			
25	Ch	ePZ	14	22	12			Near coast of Honshu			
		epPZ	32					Japan			
		ePcPZ	38					depth about 64 km			
		esPZ	46					Mag 6.0 (Qt)			
		ePPZ	24	43		25	Qt	ePnZ	20	36	42
		eSN	31	00				iPgZE			44

Seismological Bulletin of Pakistan
Volume 7 No. 11, November 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		iSnZHEN*	37	03				USCGSH 05 57 07.6			
	Wr	ePZ	36					31.6 N 131.1 E			
	Kr	ePZ	36					Near South coast of			
		eSE	38	40				Kyushu, Japan			
		H 20 36 15						depth about 25 km			
		29 $\frac{3}{4}$ N 68 $\frac{1}{2}$ E						Mag 6 $\frac{1}{4}$ -6 $\frac{1}{2}$ (Pas)			
		Near Sibi				27	Ch	ePZ	17	18	26 c
		West Pakistan						ipPZ			35
26	Qt	ePZ	09	41	19			ePPZN			20 01
	Wr	iPZ	41					ePcPZNE			19
26	Lh	ePZ	18	41	02			ePPPZN			30
	Wr	ePZ	26					ePcSZNE			24 08
	Qt	ePZ	42	10				eSZNE			42
27	Ch	ePZ	06	04	12 c			esSNE			58
		ePPZNE	05	32				eSSNE			27 51
		ePPZN	55					eScSN			28 24
		ePcPZ	06	34				Mu Sec			
		eSN	09	48				PZ 0.8 1.6			
		eScSN	14	28				$\Delta = 42^\circ.2$			
	Lh	ePZ	05	49			Lh	ePZ	17	20	41
	Wr	ePZ	06	02				eSN			28 52
	Qt	ePZ	38				Wr	ePZ	21	02	
		epPZ	46				Kr	ePZ			06 \pm
		ePcPZNE	07	37				epPZ			20
		ePPNE	08	39			Qt	ePZ			18 c
		eSN*	14	10				ipPZ			26
		esSN*	30					ePcPZ			46
		eScSN	16	24				ePPZNE			23 37
		eSSN*	17	58				ePPPNE			25 25
		eLN*	20.7					ePcSNE			47

Seismological Bulletin of Pakistan
Volume 7 No. 11, November 1961

Major Shocks

Date	Station	Phase	h	m	s
		eSNEN*	29	59	
		esSNE	30	18	
		iPSEN*	27		
		iPPSNN*	37		
		iSeSN*	31	08	
		i(SS)N*	34	00	
		eLN*	38.5		
		ePKPPKPZ	49	58	
		Mu Sec			
		PZ 1.3	1.8		
		$\Delta = 66^\circ.0$			
		USCGS H 1710	33.3		
		0.6 S	127.1	E	
		Halmahera region			
		depth about 25 km			
		Mag $6\frac{1}{4}$ - $6\frac{1}{2}$ (Pas), 6.4			
		(Ch), 6.6 (Qt)			
27	Qt	ePnZ	19	21	47
		iSnNE Δ	22	12	
	Wr	ePZ			29
		H 19 21 13			
		Eastern Afghanistan			
28	Qt	ePZ	02	44	33
28	Ch	ePZ	02	48	10 c
		epPZ			33
		ePcPZ			50 04
		eSNE			54 26
	Wr	iPZ			50 46
	Qt	ePZ			51 01

Date	Station	Phase	h	m	s
		USCGS H 02 40	21.2		
		0.2 S	128.0	E	
		Halmahera			
		depth about 62 km			
28	Ch	ePZ	08	03	10
	Qt	ePZ			04 28
		USCGS H 07 53	43.9		
		46.7 N	153.5	E	
		Kurile Islands			
		depth about 80 km			
28	Qt	ePZ	10	16	35
		eSNE			17 58
	Kr	ePZ			32 \pm
	Ch	ePZ			19 30
		esPZN			42
		ePPZ			51
		ePPPZ			20 04
		eSNE			23 11
		USCGS H 10 14	44.5		
		35.7 N	73.6	E	
		India - Pakistan border			
		depth about 31 km			
29	Qt	ePKPZ	05	02	46
		USCGS H 04 43	07.7		
		38.5 S	75.0	W	
		Near coast of Chile			
		depth about 85 km			
30	Qt	ePZ	01	21	36
30	Qt	ePZ	12	28	04 d

Seismological Bulletin of Pakistan
Volume 7 No. 11, November 1961

Major Shocks

Date	Station	Phase	h	m	s
		USCGS H 12 20	07.3		
		43.8 N	132.1	E	
		Near Vladivostak			
		USSR			
		depth about 469 km			
30	Qt	ePZ	16	57	36
		USCGS H 16 46	51.5		
		3.3 S	8.6	E	
		Northern Tunisia			
		depth about 62 km			
30	Wr	iPZ	19	26	28
	Qt	ePZ			27 14

Date	Phase	h m s	Date	Phase	h m s
	Quetta				
1	e(P)Z	09 04 04	6	eSN	25 05
1	ePZ	15 50 46	6	ePZ	20 01 27
2	e(P)	10 49 50	6	eXN	41
3	eXN	12 46.0	6	ePZ	21 28 12
3	ePgZ	19 49 32	7	eSN	29 31
	eSgE	43	7	ePZ	12 40 55
3	ePgZ	19 58 21	7	ePgZ	19 04 30
	eSgE	28		eSgNZ	41
4	ePZ	02 21 16	8	eXZ	04 06 49
	eSgE	28	8	eSN	07 24
4	ePZ	02 21 16	8	eXN	09 04 55
4	ePZ	21 03 21	8	eSNE	05 00
	eSN	04 53	8	ePN	14 29 00
4	ePZ	21 36 02	8	eSNZ	17
5	ePZ	01 49 01	8	ePZ	18 44 34 d
	eSN	19	8	ePZ	20 01 07
5	eXN	02 52.7	9	eSN	02 28
5	eXZ	11 01 34	9	ePZ	04 04 40
5	ePZ	19 08 00	9	eXZ	06 09 21
	eSN	17	9	ePZE	19 39 26
5	ePZ	19 34 29	9	ePZ	20 32 57
	eXZ	34		eXZ	33 09
5	ePZ	19 45 22	10	ePZ	03 22 05
5	ePgZ	19 48 34	11	ePZ	03 43 16
	eSgZN	37	11	ePZ	07 33 13
6	ePgZ	07 42 46	11	eSNE	34 35
	eSgN	59	11	eXZ	14 19 21
6	ePZ	16 23 43	11	eXZ	14 34 03
			11	ePZ	16 06 52
			11	ePgZ	16 30 40

Date	Phase	h m s	Date	Phase	h m s
11	eSgN	53	15	eSN	53 43
11	ePZ	20 16 43 d	15	ePZ	12 46 52
	eSN	18 09		eSN	47 17
	ePZ	20 01 07	16	ePZ	03 36 00
	eSN	31		eSZ	37 17
11	ePZ	21 30 31	16	ePgZ	15 23 28
12	ePZ	01 44 43±		eSgZ	38
	eXZ	45 56	17	ePZ	11 33 23
12	ePgZ	05 59 14	17	ePgZ	16 49 33
	eSgn	16		eSgNE	34
12	eXZ	09 37 39	17	ePZ	17 19 40
13	ePZ	00 11 03		eSNE	44.0
13	ePZ	04 08 57	18	eXZ	10 57 47
	eSZ	09 27	18	eXZ	17 08 08
13	ePZ	05 34 53		eSN	18
	eSN	35 34	18	ePZ	18 49 31±
13	ePZ	10 46 53		eSNE	50 48
	eSN	47 18	19	ePZ	03 47 21
13	ePgZ	11 53 56 d	19	eXZ	04 13 37
	eSgNE	54 09	19	ePgZ	08 48 24±
13	ePgZ	15 56 57 c		eSgZ	38
	eSgN	57 10	19	ePZ	09 45 41
13	ePgZ	16 29 22		eSNE	47 29
	eSgNE	35	19	eXZ	16 04 09
13	eXZ	17 21 33	19	eXZ	16 19
14	ePZ	01 14 50	20	ePE	12 21 08
14	eXZ	13 24 24		eSE	22 20
14	ePgZ	16 01 39	20	eXE	18 36 02
	eSEN	42	20	ePgZ	09 15 50
15	eXZ	09 52 28	21		

Seismological Bulletin of Pakistan
Volume 7 No. 11, November 1961

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
21	eSgNE	16	02		26	ePE	04	43	28
	ePZ	17	54	03	26	ePgZ	08	19	57
	eSN		29			eSgE		20	01
22	eXZ	03	00	19	26	ePZ	14	43	15
22	ePgZ	17	53	01	26	ePgZ	17	58	23
	eSgN		17			eSgN		36	
22	ePNZ	20	56	54	26	ePZ	20	45	12
	eSN		57	15		eSNE		46	47
23	ePZ	08	26	02		eXN		52	
	eSN		26		26	ePgZ	22	27	44
23	ePgZ	13	17	01		eSgNE		28	07
	eSgN		11		27	ePZ	00	30	57±
23	ePgZ	23	43	22		eXNE		32	15
	eSgE		33		27	ePZ	05	11	58
24	ePgE	08	50	26		eXZ		12	00
	eSgE		31		27	ePZ	05	20	10
24	ePgN	17	22	18		eSE		37	
	eSgN		19		28	ePZ	06	38	37
24	ePE	22	24	24		eSNE		40	39
	eXZ		36		28	ePZ	07	09	50
25	ePZ	12	11	07		eSN		11	18
	eXE		10		28	ePZ	07	28	58±
	eSNE		13	04	28	ePZ	10	15	04
25	ePZ	20	21	12±	28	ePE	20	52	56
	eXZ		17			eSE		53	08
25	ePZ	20	43	24	28	ePE	22	14	31
	eSNE		45			eSE		15	45
25	ePE	23	09	36	28	eXE	22	50	09
	eSZ		10	53	29	ePE	00	07	26

Seismological Bulletin of Pakistan
Volume 7 No. 11, November 1961

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
29	eXE	01	42	10	3	ePZ	13	23	45
29	ePE	02	28	06		iSZ		24	20
	eSE		35		4	ePZ	11	59	44
29	ePZ	08	58	45		iSZ		12	00
29	eXZ	10	07	42	5	iPZ	10	45	30 c
29	ePE	11	37	46±		iSZ		46	21
	eSE		39	12	5	ePZ	19	33	36
29	ePgE	12	02	04	5	ePZ	22	10	56
	eSgNE		11		6	ePZ	03	15	08
29	eXE	12	12.0		6	iPZ	07	31	19 d
29	ePZ	16	27	37	6	ePZ	12	18	23
30	ePgZE	01	43	14±		iSZ		19	04
	eSgNE		28		6	ePN	16	22	42
30	eXN	03	11.0			eSN		23	14
30	eXN	06	08.0		6	ePN	21	27	14
30	eXZ	07	53.0			eSN		45	
30	ePZ	11	29	05±	7	iPgZ	06	21	13 d
	eSNE		30	26		iSgZ		25	
					7	ePZ	12	09	41
					8	ePZ	04	04	58
						iSZ		05	34
1	ePZ	05	52	50	9	iPZ	11	18	20 d
1	iPZ	05	57	19 d		iSZ		55	
2	iPZ	02	59	54 c	9	ePZ	15	15	08
2	ePN	08	30	00		iSZ		16	01
2	ePN	19	14	45	9	ePZ	20	25	40
3	ePN	02	17	55		iSZ		26	13
3	ePZ	05	04	16	9	iPZ	20	31	53
	iSZ		47		9	ePZ	04	47	16
3	ePZ	11	11	13	10	ePN	19	19	22
	eSZ		52		10				

Warsak

Date	Phase	h m s	Date	Phase	h m s
11	eSN	47	18	ePZ	04 55 50
	iPZ	07 32 13		eSZ	56 25
	iSZ	48	18	ePZ	10 44 29
11	ePZ	16 05 25	18	ePZ	13 22 21
	iSZ	06 03	18	ePZ	17 31 12
11	iPZ	21 29 27 d	18	ePZ	18 48 38
	eSZ	55		iSZ	49 13
12	iPZ	01 00 12 d	19	ePZ	01 34 35
12	ePZ	07 15 28	19	ePZ	04 13 17
	iSZ	58	19	ePgZ	13 50 36
12	ePZ	19 26 26		iSgZ	42
14	iPZ	07 24 21 d	19	ePZ	16 03 10
	iSZ	53		iSZ	36
14	iPZ	17 23 00	19	ePZ	17 01 15
14	iPZ	17 28 06	20	ePZ	00 39 29
15	ePZ	04 13 43	20	ePN	12 20 15
15	ePZ	06 18 30		eSN	46
	eSZ	19 02	21	iPZ	09 25 05
15	iPZ	13 19 17		iSZ	36
	eSZ	44	22	ePZ	01 46 38
15	ePZ	13 58 27	22	ePZ	19 22 49
16	iPZ	03 34 58	22	iPZ	20 40 16
16	ePZ	15 16 20	23	iPZ	04 14 57
	iSZ	37		iSZ	15 25
17	ePZ	01 34 22	23	iPZ	04 52 10
17	ePZ	05 59 11		iSZ	30
	eSZ	41	23	ePZ	09 00 21
17	ePZ	07 21 34	24	iPZ	08 48 07
18	ePZ	04 31 26		iSZ	40
	iSZ	32 07	24	ePZ	09 33 15

Date	Phase	h m s	Date	Phase	h m s
24	iPZ	11 32 14	29	ePZ	11 36 49
	iSZ	47		iSZ	37 18
24	ePZ	14 24 08	29	iPZ	16 26 42
	iSZ	49		iSZ	27 11
24	ePZ	16 07 00	29	ePZ	23 23 46
	iSZ	40		eSZ	24 37
24	iPZ	18 58 40	30	iPZ	11 27 59
	iSZ	18 26		iSZ	28 28
25	iSZ	18 26			
25	ePZ	12 10 01		Lahore	
25	ePZ	23 08 31	5	ePZ	07 45 05
	iSZ	09 00	5	ePZ	10 45 50
26	ePZ	13 38 39	5	eXZ	19 33 50
26	ePZ	13 52 58	9	ePZ	15 14 27
26	ePZ	20 44 02	9	e(P)Z	20 33 35
	eSN	42	10	eXZ	13 58 42
27	ePN	05 12 51	10	iPZ	19 21 00
27	ePZ	19 11 37	10	ePZ	21 52 39
	iSZ	12 24	14	ePZ	10 11 34
27	ePZ	22 15 50	14	ePZ	22 36 39
28	iPZ	03 57 22	15	iXZ	00 58 24
	iSZ	58	21	ePZ	05 02 29
28	ePZ	06 37 34	21	ePZ	18 13 16
28	iPZ	06 53 44	22	ePZ	22 39 53
	iSZ	54 20	25	ePZ	20 38 09
28	iPZ	21 13 34	26	ePZ	20 44 33
	iSZ	14 08	27	ePZ	19 24 07
28	ePZ	22 47 59	28	ePZ	10 14 27
			29	ePgZ	19 27 39

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
	Karachi				14	eXZ	06	38.5	
4	ePZ	13	08	30	15	ePZ	13	54	19
	exz		10	10		eSN			53
5	iPZ	10	47	10	15	eXZN	17	58	46
17	eXZ	01	45	37		iXN			56
	eSE		47	03	16	eXZN	08	12.3	
21	eXZ	09	07	26	17	eXZN	05	40.2	
21	ePZ	11	08	39	17	eXZN	06	27.0	
	eSE			54	17	eXN	07	03.3	
22	eXZ	08	25	45	17	ePZ	07	36	30 c
	Chittagong					iSZN		37	03
1	eXN	20	41	58	17	ePZ	18	45	33
2	ePNE	07	08	58		iSZN			46
3	eXE	06	06.1		18	eXZ	10	54	46
4	eXNE	07	18	08	18	eXZ	14	47	45
4	eXZ	18	33	22	19	ePgZN	22	27	32
5	eXN*	10	27	00		iSgZN			33
7	eXZ	21	28	03	20	eXZ	10	57	58
8	eXE	02	56.0		20	ePZ	13	16	56
8	ePnZ	20	41	28	20	eXZN	15	44	35
	eSgZ			36	20	ePZ	18	31	32
	eSnNE		42	03		eSZN			49
	eSgN			11	21	ePZ	07	14	23
10	ePgZ	07	52	02	21	e(P)Z	18	48	30
13	eXZ	08	52.6			eSN		49	32
13	eXZN	09	20.1		22	eXZ	21	55	42
14	eXZ	06	01.5		23	ePZN	00	36	07 ±
						eSN			46
					23	e(P)Z	10	55	25

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
23	eXZ	16	42	14					
25	eXZ	16	52.0						
25	eXZ	18	17	12					
26	eXZ	01	12	58					
26	e(P)Z	09	39	44					
26	ePZ	18	39	26					
	eSN			41 07					
27	iXZNE	19	42	23					
28	eXZ	10	17	45					
30	eXZ	11	04.0						
30	eXE	19	31.9						
30	eXE	21	09.8						

28 NOV 1961

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Vol .7 December 1961 No. 12

CONTENTS

1.	Particulars of Stations and Instruments
2.	Major shocks	...	...	...	3
3.	Local and Minor shocks	...	...	...	23

Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
QUETTA (Central Station)				
Spregnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Contd.)

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Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,800
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki), (Pal) stand for seismological observatories Pasadena (U.S.A.),
 Berkley (U.S.A.), Uppsala (Sweden), Kiruna (Sweden) & Palisade (U.S.A.) respectively,
 All times are in Greenwich Mean Time.

Seismological Bulletin of Pakistan
 Volume 7 No. 12, December 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
1	Ch	ePZ	07	44	22 d			iSNE	23	43	
		ePcPZ		45	19			isSZE	25	07	
		eSE		52	30			ePcSZ		28	
	Qt	ePZ		45	10			eScSNE	29	13	
		ePPZNE		47	38		Lh	ePZ	20	54 c	
		USCGS H 07 34 17.9						eSNE	27	07	
		56.6 N 158.8 E					Wr	ePZ	21	11	
		Kamchatka					Qt	ePZ		45 c	
		depth about 18 km						ipPZNE*	22	36	
1	Lh	ePZ	08	07	38			ePcPZEN*	23	00	
	Qt	ePZ		08	23			ePPZEN*		41	
		USCGS H 07 58 49.7						eXZE	24	33	
		8.7 N 122.0 E						ePPPZEN*		52	
		Off cost of Negros						eSZNEN	28	44	
		Philippine Islands						isSN*	30	18	
		depth about 36 km						iScSN*	31	08	
1	Ch	ePZ	09	24	36 c			i(SS)N*	32	40	
		ePPZ		26	30			isSS	33	45	
	Qt	ePZ		27	18 c			eLN*		34.4	
		USCGS H 09 16 06.9					Kr	ePZ	21	21 52	
		6.0 S 130.8 E						epPZ		22 44	
		Banda Sea						USCGS H 21 13 04.1			
		depth about 85 km						26.5 N 124.9E			
1	Ch	iPZ	21	19	00 c			East China Sea			
		epPZNE			46			depth about 206 km			
		eSPZ		20	03	2	Qt	ePZ	12	49 00 c	
		ePPZ			10			eXZ		59	
		ePPPZ			30			ePPZNE	50	57	
		ePcPZE		21	48			ePPPNE	51	52	

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
	Kr	ePZ	49	20			Qt	ePZ	35	31		
	Lh	ePZ		39				eSNE	37	55		
	Ch	ePZ	51	39	c		Ch	ePZ		32		
		ePPZ	54	22				H 09 32 25				
	USCGS H	12 40 17.8						41.7 75.1 E				
	36.5 N	8.6 E						Kirghiz, S.S.R.				
	Nrothern Tunisia							USCGS H 09 32 23.1				
	depth about 62 km							41.4 N 75.0 E				
2	Qt	ePZ	19	44	54			Kirghiz, S.S.R.				
	USCGS H	19 33 23.8						depth about 25 km				
	3.3 S	138.8 E					3	Qt	ePZ	10	01	31
	New Guinea						3	Ch	ePZ	16	26	34
	depth about 145 km							USCGS H 16 14 31.4				
3	Ch	iPZ	08	46	16 d			11.6 S 166.1 E				
		epPZ		42				Santa Cruz Islands				
		ePPZ		47	13			depth about 122 km				
		eSN		50	53		3	Qt	ePZ	18	36	45
		cPcSZ		52	50			epPZN		57		
		eScSN		56	45			ePPZNE		37	10	
	Lh	ePZ		48	17			e(S)NN*		40	54	
	Wr	ePZ		36				e(SS)N*		41	28	
	Qt	ePZ		49	08			eLN*		42.7		
		eSPZ		42				Wr	ePZ	36	59	
	USCGS H	08 40 20						Ch	ePZ	40	20	
	25.0 N	122.9 E						USCGS H 18 31 59.1				
	Off cost of Formosa							41.2 N 44.0 E				
	depth about 91 km							Armenia S.S.R. Turkey				
3	Qt	ePZ	08	54	10			border region				
3	Wr	ePZ	09	34	25			depth about 49 km				

4

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
3	Ch	ePZ	20	02	18							
		epPZ		03	38			Off northwest coast of				
		eScPZ		07	20			Kamchatka				
		eSZNE		55				depth about 15 km				
		eScSNE		11	33	4	Ch	ePZ	12	39	37	
	Lh	ePZ		03	14		Qt	ePZ		42	13	
	Wr	ePZ		19			4	Ch	ePZ	12	40	53 d
	Qt	ePZ		58	d			ePPZNE		41	06	
		eSNEN*		11	06			iSZNE		42	57	
		e(sS) NEN*		13	05			Mu	Sec			
	USCGS H	19 55 05.3						PZ 1.0	1.5			
	43.6 N	134.9 E						$\Delta = 11^\circ.3$				
	Vladivostak, USSR						Lh	ePZ		42	15	
	depth about 420 km							eSNE		45	36	
3	Qt	ePZ	21	15	20		Wr	ePZ		42	44	
	USCGS H	21 03 20.2					Qt	ePZ		43	28 d	
	4.1 S	142.3 E						iSPE		44	00	
	New Guinea							iSNEN*		47	46	
	depth about 88 km							i(SS)N*		48	54	
4	Qt	ePZ	03	55	11			eLN*		50.3		
	USCGS H	03 42 38.2						Mu	Sec			
	55.2 N	159.9 W						PZ 2.3	2.5			
	Off south coast of							$\Delta = 24^\circ.5$				
	Alaska Peninsula						Kr	ePZ		12	43	49 ±
	depth about 106 km							e(S)E		48	28	
4	Qt	ePZ	08	31	00			H 12 38 06				
		ePPZ			05			33½ N 95 E				
	USCGS H	08 20 14.0						Eastern Tibet				
	60.3 N	160.4 E						USCGS H 12 38 11.9				
								33.2 N 95.3 E				

5

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Major Shocks

Date	Station	Phase	h	m	s
		Tibet			
		depth about 45 km			
		Mag:- 6.4 (Qt)			
4	Qt	ePZ	21	07	50
5	Qt	ePKPZ	07	03	50 d
		USCGS H 06 44 12.7			
		45.9 S 74.6 W			
		Southern Chile			
		depth about 25 km			
5	Ch	ePZNE	13	13	34
		eSPZ	14	05	
		eXZ	16	30	
		eSNE	24	00	
		esSE	37		
		ePPSN	25	33	
		ePZ	15	02	
		ePPZ	19	16	
		eSKSN*	25	45	
		e(S)NEN*	26	58	
		esSSN*	34	20	
		USCGS H 13 01 04.7			
		50.8 S 139.8 E			
		Southwest of Tasmania			
		depth about 64 km			
5	Ch	ePZN	13	14	42
		epPZN	15	26	
		eSNE	24	49	
		USCGS H 13 02 31.9			
		16.0 S 168.1 E			
		New Hebrides Islands			
		depth about 145 km			
6	Ch	ePZ	02	24	19
	Wr	ePZ	25	39	
	Qt	ePZ	26	15	
		USCGS H 02 15 59.5			
		37.8 142.6 E			
		Off east coast of			
		Honshu, Japan			
		depth about 47 km			
6	Ch	iPZ	05	50	46 c
		iPPZNE	56		
		eXZ	51	18	
		iSNE	52	25	
	Lh	ePZ	54	01	
	Wr	iPZ	54	34 c	
	Qt	ePZ	44	0	
		eSPZ	55	04	
		ePPZN	42		
		ePPPZEN*	48		
		eSNEN*	59	35	
		iXN*	54		
		iLN	06	01.9	
		Mu Sec			
		PZ 1.2 1.6			
		$\Delta = 29^\circ.0$			
		H 05 48 40			
		14 N 93 $\frac{1}{2}$ E			
		Andaman Islands			

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Major Shocks

Date	Station	Phase	h	m	s
		USCGS H 05 48 39.3			
		13.7 N 93.6 E			
		Andaman Islands			
		depth about 53 km			
		Mag 5 $\frac{3}{4}$ -6 (Pal),			
		6.5 (Qt)			
6	Ch	ePZ	13	49	31
		eSKSE	14	00	12
		eSNE	59		
	Qt	ePKPZN	13	54	44
		USCGS H 13 35 43.8			
		23.5 S 176.0 W			
		Tonga Island region			
		depth about 18 km			
		Mag 6 $\frac{1}{4}$ (Berk)			
6	Ch	ePNE	16	49	16
		ePPNE	27		
		eSNE	57	05	
		eScSNE	59	10	
	Lh	ePZ	49	48	
	Wr	ePZ	49		
	Qt	ePZ	50	26	
		ePcPZ	57		
		ePPZ	52	57	
		ePPPZE	54	32	
		ePcSNE	59		
		eSN*	59	10	
		ePSNN*	37		
		ePPSEN*	47		
		eSSN*	17	03	37
		eLN*	07.4		
		ePKPPKPZ	18	48	
		USCGS H 16 39 31.5			
		49.4 N 155.2 E			
		Kurile Islands			
		depth about 22 km			
		Mag 6-6 $\frac{1}{4}$ (Pas), 6 $\frac{1}{4}$ (Berk)			
		ePKPZ	00	37	24
7	Qt				
		USCGS H 00 18 26.0			
		23.4 S 175.9 W			
		Tonga Islands region			
		depth about 45 km			
7	Qt	ePZ	09	24	11
		USCGS H 09 11 06.0			
		6.8 S 155.2 E			
		Solomon Islands			
		depth about 62 km			
8	Qt	ePZ	03	29	06
	Lh	ePZ	30	17	
8	Ch	ePZ	06	16	34
		ePcPZ	17	51	
		eSNE	23	47	
		esSNE	24	24	
	Qt	ePZ	19	12	c
		USCGS H 06 07 38.6			
		3.0 S 136.9 E			
		Northwest New Guinea			
		depth about 64 km			

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Major Shocks

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
8	Ch	ePZ	09	45	34 c						
		epPZ			54		Wr	eSNE	24	28	
		ePcPZ	46	46				ePZ	23	04	
		ePPZ	47	31				eSN	25	34	
		ePPPZ	48	32			Qt	ePZ	23	52	
		eSNE	52	56				epPZ	24	01	
		eScSN	55	24				esPE	08		
Lh		ePZ	47	31				eSNE	27	02	
Wr		iPZ			51 c			esSNE	15		
Kr		ePZ	48	00			Kr	ePZ	24	12 ±	
Qt		ePZ			09 c			esS	27	49	
		ePcPZE			15			H 10 19 54			
		epPZE			22			30 N 87 E			
		e(PP)Z	50	47				Tibet			
		eSN*	57	46				depth about 50 km			
		esSN*	58	09				USCGS H 10 19 54.4			
		Mu			Sec			30.5 N 86.7 E			
		PZ 0.4			1.5			Tibet			
		Δ = 74°.9						depth about 45 km			
		USCGS H 09 36 24					8	Qt	ePZ	10	45 43
		1.8 S 139.4 E						eSN		50	02
		Near north coast of						USCGS H 10 40 23.2			
		New Guinea						11.4 N 49.7 E			
		depth about 55 km						Gulf of Aden			
		Mag 6.1 (Qt)						depth about 25 km			
8	Ch	ePZ	10	22	06	8	Wr	iPN	13	07	20 c
		esPZE			26			iSN		50	
		iSZNE	23	52			Lh	ePZ	08	00	
	Lh	ePZ	22	28				eSNE	09	02	
							Qt	ePZ	08	20 d	

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSNE	09	38							
		H 13 06 40									
		36 N 71 E									
		Hindukush									
		depth about 200 km									
8	Qt	ePZ	16	24	47						
		USCGS H 16 11 47.6									
		6.8 S 154.8 E									
		Solomon Islands									
		depth about 120 km									
9	Qt	ePZ	02	28	10						
		epPZ			18						
		ePPZN			31 33						
		eSKSN*			38 38						
		eSNE			43						
		eScSNEN*			53						
		esSNE			39 07						
		eSSN*			44 35						
		USCGS H 02 15 22.0									
		56.3 N 153.9 W									
		Kodiak Islands									
		Alaska region									
		depth about 34 km									
		Mag 5½ (Pal), 5½-5¾ (Pas)									
9	Qt	ePKPZ	04	18	23						
		epPKPZ			29						
		ePPZNE			21 33						
		ePKSNE			22 10						
	Wr	ePKPZ	18	29							

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

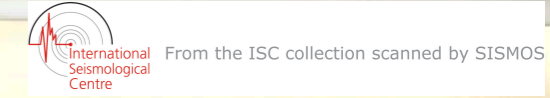
Major Shocks

Date	Station	Phase	h	m	s
		eSKSZNEN*			57
		eSKKSEN*	48	18	
		eSKSPN*	51	41	
		eSSN*	12	00	35
Wr		ePKP ₂ Z	11	38	00
Lh		ePKPZ	37	59	
	USCGS H	11 18 08.9			
		43.7 S 75.2 W			
		Near coast of Chile			
		depth about 34 km			
		Mag 5 $\frac{1}{4}$ -6 (Pal),			
		6 $\frac{1}{2}$ (Berk), 6 $\frac{1}{2}$ (Pas)			
9	Wr	ePZ	16	45	13
	Qt	ePZ			16
	USCGS H	16 35 53.2			
		8.9 S 105.6 E			
		South of Java			
		depth about 350 km			
9	Ch	eXN	20	02	55
		eSKSNE	11	55	
		eSN	12	24	
	Qt	ePKPZ	07	29	
		epPKPZ	09	44	
	USCGS H	19 49 41.3			
		21.7 S 179.9 E			
		Fiji Islands			
		depth about 620 kms			
9	Qt	ePZ	20	17	42
10	Qt	ePZ	08	45	53

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Major Shock

Date	Station	Phase	h	m	s
		USCGS H	16 53 05.3		
			36.5 N 23.5 E		
			Near coast of southern		
			Greece		
			depth about 25 km		
12	Ch	ePZ	04	03	12
		epPZ			34
		ePcPZ	04	52	
		eSZN	09	40	
		e(sS)N	10	21	
	Qt	ePZ	05	59	
		eSN*	14	51	
	USCGS H	03 55 10.2			
		4.3 S 127.2 E			
		Banda Sea			
		depth about 64 km			
12	Ch	ePZ	17	31	53
	Lh	ePZ	33	37	
	Wr	ePZ			51
	Qt	ePZ	34	20	c
		ePcPZ			41
		ePPZ	37	00	
		eSN*	43	34	
		eSSN*	48	12	
		eLN*	53.0		
	USCGS H	17 23 04.0			
		21.7 N 146.0 E			
		Northern Mariana			
		Island region			



Major Shocks

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
		Hokkaido, Japan										
		depth about 44 km						Kr	ePZ		16	c
		Mag 6.2 (Qt)						Qt	ePZ		22	c
13	Qt	ePKPZ	11	42	58			ePcPZ		30		
		epPKPZ		43	40 ±			iSNEN*		32	15	
		ePPZ		46	38			eScSEN*		35		
	Wr	ePKP ₂ Z		43	12			ePKPPKPZ		49	30	
	Ch	ePKPZ		11				USCGS H 07 10 23.2				
		ePKP ₂ Z		32				3.1 S 14.9 E				
		epPKPZN		44				Near north coast of				
		USCGS H 12 23 28.9						New Guinea				
		50.9 S 73.0 W						depth about 44 km				
		Southern Chile					14	Wr	iPZ		11	00 47 d
		Argentina border							iSZ		01	35
		depth about 82 km						Lh	ePZ			15
14	Ch	iPZ	07	19	51 c		Qt	eSZN		02	28	
		epPZN		20	05			ePZ		01	55	
		esPE		11				e(sP)E		02	30	
		ePcPZ		44				eSNE		03	41	
		ePPZ		22	03			H 10 59 39				
		ePPPZNE		23	00			38 N 74 E				
		ePcSN		24	54			Tadzhikistan				
		eSZN		27	23			S. S. R.				
		esSN		47				depth about 200 km				
		eScSN		29	37		14	Qt	ePZ	12	25 09 c	
		eSSNE		31	02			USCGS H 12 14 38.9				
		ePKPPKPZ		50	04			7.8 S 120.5 E				
	Lh	ePZ		21	47			Flores Sea				
	Wr	iPZ		22	05 c			depth about 62 km				
							15	Ch	ePZNE	02	17 38	

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
		iXZ			47							
	Qt	ePZ		22	18							
		eSNE		26	24							
		H 02 17 05										
		24.0 N 92.0 E										
		East Pakistan Assam										
		border										
15	Qt	ePZ		12	48 43							
		epPZE		49	40							
		USCGS H 12 36 30.7										
		5.5 S 147.2 E										
		Near north coast of										
		New Guinea										
		depth about 181 km										
15	Wr	ePN		19	25 40							
		eSN		26	21							
	Lh	ePZ		30								
		eSNE		27	55							
	Qt	ePZ		26	35							
		eSNE		28	04							
		H 19 24 39										
		37½ N 69½ E										
		Afghanistan Tadzhik										
		S. S. R. border										
15	Ch	ePZ		19	43 34							
	Lh	ePZ		45	54							
	Qt	ePZ		46	31							
		USCGS H 19 36 03.5										
		0.9 N 126.2 E										

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Near coast of southern Chile depth about 85 km				18	Ch	iPZN	16	43	47
17	Ch	ePZ	22	13	25			e(sP)ZN			58
	Wr	ePZ		15	59		Lh	iSZNE		44	47
	Qt	ePZ		16	11		Wr	ePZ		46	49
17	Ch	ePZ	22	25	22 ^c		Qt	iPZ		47	19
		epPZ			33			iSN		51	16
		ePPZ		28	56		Qt	ePZ		47	50
		eSNE		36	11			epPZE		48	12
	Qt	ePKPZ		31	03 [±]			eSNEN*		52	11
		USCGS H 22 12 32.3						eSSNN*		51	
		54.5 143.9 E						H 16 42 24			
		South of Tasmania depth about 45 km						26 N 96 E			
18	Ch	ePZ	02	24	20			India Burma border depth about 100 km			
		epPZ			34			USCGS H 16 42 21.6			
		e(PP)Z		25	00			26.4 N 96.3 E			
		ePZ		27	28			Burma India border depth about 85 km			
		USCGS H 02 18 31.3				19	Lh	ePZ	15	50	56
		19.6 N 120.8 E						eSE		58	38
		Off north coast of Luzon, Philippine Islands depth about 32 km					Wr	ePZ		51	17
18	Lh	ePZ	09	22	56		Qt	eSN		59	17
		eSN		24	07			ePZ		51	37
	Qt	ePZ		23	33			ePPZ		53	57
		eSNE		25	19			eSZNE		59	53
		H 09 21 19						USCGS H 15 41 15.0			
								5.0 N 127.2 E			
								Taland Islands region depth about 33 km			

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
19	Lh	ePZ	17	38	06			ePKSZ		47	44
	Wr	ePZ			26		Lh	eXZ		44	18
	Qt	ePZ			58 ^c		Ch	ePKSN		47	46
		USCGS H 17 30 09.7						ePKP ₂ Z		45	08
		24.2 N 122.4 E						epPKPZN			50
		Near coast of Formosa depth about 93 km						epPKP ₂ Z			56
								e(SKS)N		51	57
20	Lh	ePZ	01	53	19			USCGS H 13 25 34.4			
	Wr	ePZ			43			4.6 N 75.6 W			
	Qt	ePZ			59			West central Colombia depth about 176 km			
		USCGS H 01 44 19.7						Mag 6 $\frac{1}{2}$ (Pas), 6 (Pal)			
		3.0 N 118.4 E						ePZE		00	54 39
		Near coast of Borneo depth about 17 km				21	Qt				
20	Qt	ePZ	02	44	31			USCGS H 09 44 26.2			
	Wr	ePZ			45 30			6.6 N 126.6 E			
20	Qt	ePZ	07	44	03			Near coast of Mindanao depth about 25 km			
20	Qt	eXZE	13	44	14			ePZ		13	41 37
		ePKPZ			26	21	Lh				
		epPKPZ			45 13			USCGS H 13 30 43.3			
		ePKSZNEN*			47 35			7.5 S 129.2 E			
		epPKSE			48 35			Banda Sea depth about 201 km			
		esPKSZE			52			ePZ		16	08 56
		ePPPZE			49 31	21	Qt				
		iXN*			55 56	21	Lh	ePZ		18	52 28
		iSSN*			14 03 46		Qt	ePZ			53 55
	Wr	eXN	13	44	53	22	Qt	ePZ		10	45 17
		ePKSN			47 36			USCGS H 10 33 42.5			
	Kr	ePKPZ			44 31			2.8 S 136.7 E			
		epPKPZ			45 20			New Guinea			

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Date	Station	Phase	h	m	s
		depth about 38 km			
22	Lh	ePZ	22	56	51
	Wr	ePZ		57	03
	Qt	ePZ			28
		epPZ		58	10
		eSPZE			29
		esPPZNE	23	01	07
		esSN*		07	41
		esSSN*		12	05
		USCGS H 22 46 24.6			
		18.6 N 145.6 E			
		Mariana Islands			
		depth about 155 km			
22	Wr	ePZ	23	52	06
	Qt	ePZ			33
		eSNE		59	50
		USCGS H 23 43 35.3			
		16.4 N 120.4			
		Near coast of Luzon			
		Philippine Islands			
		depth about 33 km			
23	Lh	ePZ	12	52	10
	Wr	ePZ			27
	Qt	ePZ		53	00
23	Wr	iPZ	18	09	39d
		iSZ		10	08
	Lh	ePZ			20
		eSNE		11	16
	Qt	ePZN		10	43

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Date	Station	Phase	h	m	s
		Major Shocks			
		esPNE	11	29	
		eSNE	12	02	
	Kr	ePZ	13	49	
		H 18 09 01			
		37 N 71 E			
		Hindukush			
		depth about 150 km			
		USCGS H 18 09 04.7			
		36.3 N 71.3 E			
		Hindukush			
		depth about 183 km			
23	Lh	ePZ	19	20	46
	Qt	ePZ		21	31d
		epPZE		22	40
		USCGS H 19 11 54.5			
		34.9 N 137.6 E			
		Near coast of Honshu			
		Japan			
		depth about 270 km			
24	Wr	ePZ	02	51	47
	Qt	ePZ			52 03
		epPZE			13
		ePPZN		55	00
		eSNEN*	03	01	53
		esSNN*		02	14
		USCGS H 02 40 07.6			
		3.4 S 14 0.3 E			
		New Guinea			
		depth about 29 km			

Date	Station	Phase	h	m	s
24	Qt	ePZ	07	00	59
		USCGS H 06 50 48.4			
		43.8 N 143.9 E			
		Near coast of northern			
		Hokkaido, Japan			
		depth about 79 km			
24	Lh	ePZ	07	14	57
		eSZ		16	03
	Wr	iPZ		15	41
		isN		17	21
	Qt	ePZE		16	16
		ePPZ			26
		ePPPZNE			34
		esN*		18	24
		eLNEN*			18.7
		H 07 13 26			
		29½ N 80¾ E			
		Western Nepal			
		USCGS H 07 13 25.4			
		29.5 N 80.9 E			
		Nepal			
		depth about 20 km			
25	Kr	ePKPZ	00	02	52
	Qt	ePKPZ			58
		ePKP ₂ Z		03	05
		ePKSNE		06	37
	Wr	ePKP ₂ Z		03	14
	Lh	ePKPZ			10
	Ch	ePKPZ			22±
		USCGS H 23 43 19.2			

Major Shocks

Date	Station	Phase	h	m	s
		38.3 S 74.6 W			
		Near coast of Chile			
		depth about 31 km			
25	Ch	ePZ	08	09	06
	Lh	ePZ			11 16
		eSN			19 38
	Wr	ePZ			11 38
	Qt	ePZ			51
		epPZ			12 01
		ePcPZ			16
		ePPZE			14 16
		eSEN*			20 48
		esSN*			21 10
		eScSN*			34
		USCGS H 08 00 59.3			
		3.7 S 127.7 E			
		Ceram Sea			
		depth about 47 km			
25	Lh	ePZ	08	23	12
		eSN			31 16
	Wr	ePZ			23 36
	Qt	ePZ			44
		USCGS H 08 13 07.2			
		1.1 S 126.7 E			
		Spice Islands			
		depth about 25 km			
25	Wr	iPZ	09	19	46 c
	Qt	ePZ			59 c
		ePPZ			22 16
		USCGS H 09 09 07.4			

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Date	Station	Phase	h	m	s
		3.7 S 127.7 E			
		Ceram Sea			
		depth about 54 km			
25	Qt	ePZ	09	25	03
		ePPZ	27	32	
		USCGS H 09 14 12.4			
		3.8 S 127.5 E			
		Ceram Sea			
		depth about 42 km			
25	Qt	ePZ	09	32	18
		epPZ	34	45	
		USCGS H 09 21 22.5			
		3.7 S 127.3 E			
		Ceram Sea			
		depth about 127 km			
25	Ch	ePZ	11	20	25
		eSZN	21	19	
	Wr	ePZ	23	20	±
	Qt	ePZ			53
		eSN*	27	43	
		H 11 19 06			
		27 N 90½ E			
		Bhutan India border			
		26.9 N 90.1 E			
		Bhutan India border			
		depth about 46 km			
25	Wr	ePZ	21	52	47
		eSN	54	10	
	Lh	ePZ	53	02	

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Date	Station	Phase	h	m	s
		eSNE	54	35	
	Qt	ePZ	53	58	
		eSNE	56	18	
		H 21 51 02			
		39.3 N 77.2 E			
		depth about 135 km			
		Western Sinkiang			
		Province China			
		USCGS H 21 51 06.7			
		39.4 N 76.9 E			
		Sinkiang Province China			
		depth about 167 km			
25	Lh	ePZ	22	34	04
		eSNE	41	27	
	Qt	ePZ	34	33	
		USCGS H 22 25 00.2			
		8.9 S 110.2 E			
		Off coast of Java			
		depth about 155 km			
26	Ch	iPZN	04	30	54
		eXZ	32	09	
		epPZ			26
		esPZ	33	29	
		isZN	35	37	
		esSN*	38	43	
		eScSN	40	16	
		Mu Sec			
		PZ 0.5 1.0			
		Δ = 34°.0			

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Date	Station	Phase	h	m	s
	Lh	ePZ	04	33	07
		eSNE	39	38	
	Qt	ePZ	43	31	d
		eSE	50	31	
		Java Sea aftershock			
27	Qt	ePZ	16	58	52 d
	Wr	ePZ	59	13	
	Lh	ePZ			23
		USCGS H 16 46 31.2			
		1.7 S 12.9 W			
		Atlantic Ocean			
		north of Ascension Island			
		depth about 37 km			
28	Lh	ePZ	00	06	48
	Wr	ePZ			51
	Qt	ePZE			56
28	Qt	ePZ	06	04	40
28	Qt	ePZ	09	09	40.6
		iSZNEN*	10	04.7	
		ePZ			16±
	Kr	ePZ			51
		eSN			12 10
		H 09 09 08			
		28½ N 67 E			
		Kalat, West Pakistan			
29	Ch	ePZ	00	07	51
		ePcPZ			08 03
		epPZ			20
		USCGS H 23 55 57.6			
		12.4 S 166.3 E			
		Santa Cruz Islands			

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
29	Lh	depth about 100 km ePZ	10 13 06			ePPZ	54 22
	Qt	ePZ	36 c			iSN*	01 01 16
		USCGS H 10 00 33.1				eScSNE	28
		6.3 S 154.5 E				esSN	52
		Solomon Islands				ePSNE	02 01
		depth about 44 km				ePPSNE	16
29	Qt	ePKPKZ	15 12 32			ePKPPKZ	17 57
		USCGS H 14 53 12.3			Kr	ePZ	00 51 46
		13.6 N 92.4 W				USCGS H 00 39 24.1	
		Off coast of Guatemala				52.3 N 177.7 E	
		depth about 37 km				Rat Islands	
29	Qt	ePZ	21 46 34			Aleutian Islands	
29	Qt	ePZ	22 12 16			depth about 52 km	
30	Ch	ePZNE	00 50 37			Mag 6½ (Berk), 6¼ (Pas),	
		epPZ	52			7 (Pal)	
		ePoPNE	58	30	Wr	iPZ	07 10 24 c
		ePPZ	53 11			iSZ	11 52
		eSNE	59 49		Lh	ePZ	10 39
		esSN	01 00 08			eSNE	12 11
		eScSE	15		Qt	ePZ	11 35 c
		ePKPPKZ	18 39			eSNEN*	13 55
		Mu Sec			Kr	ePZ	12 35
		PZ 0.6 1.6			Ch	ePZ	13 19
		Δ = 70°.7				ePPPZ	49
	Lh	ePZ	00 50 53			eSZNE	17 14
	Qt	ePZ	51 23			H 07 08 29	
		iPePZ	28			39¼ N 77½ E	
		epPZ	38			Western Sinkiang Province	
						China	
						USCGS H 07 08 29.1	

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
		39.7 N 77.7 E					
		Sinkiang Province China					
		depth about 35 km					
30	Qt	ePZ	09 05 11				
		USCGS H 08 53 14.4					
		51.9 N 177.6 E					
		Rat Islands					
		Aleutian Islands					
		depth about 67 km					
30	Qt	ePZ	09 29 11±				
		USCGS H 09 17 21.1					
		52.3 N 179.7 E					
		Rat Islands					
		Aleutiaon Islands					
		depth about 57 km					
30	Qt	ePZ	10 26 36				
		USCGS H 10 14 37.2					
		52.0 N 178.2 E					
		Rat Islands					
		Aleutian Islands					
		depth about 62 km					
30	Ch	ePZ	16 53 07				
		ePPZ	55 46				
		eSNE	17 02 13				
	Wr	ePZ	16 53 22				
	Qt	ePZ	53				
		USCGS H 16 41 51.5					
		51.7 N 178.5 E					
		Rat Islands					

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Major Shocks			
Date	Station	Phase	h m s
		7.8 S - 106.8 E	
		Near coast of Java	
		depth about 66 km	
31	Ch	ePZ	18 00 10
	Lh	ePZ	30
		ePZ	55
		USCGS H 17 48 27.8	
		51.8 N 171.2 W	
		Fox Islands	
		Aleutian Islands	
		depth about 47 km	

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Major Shocks				Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s	
	Quetta			eSNE	45 06	
1	ePZ	00 10 00	5	ePZN	22 18 31	
	eSN	18		e(S)N	59	
1	ePZ	10 04 31	6	ePZ	13 00 46	
	eSNE	56	6	ePZ	17 34 13	
2	eXZ	04 00.0	6	eXZ	19 20 24	
2	ePZ	05 14 56	6	eXZ	19 26 18	
	eSN	15 28	7	ePZ	04 27 47	
2	ePZ	11 41 09±		eSN	29 08	
4	ePZ	01 44 04 d	7	ePZ	05 20 23	
	eSN	45 24		e(S)N	47	
4	ePZ	13 06 09±	7	ePZ	13 45 40	
4	ePZ	16 36 18		eSNE	58	
	eSNE	37 25	7	eXZ	17 08 28	
4	ePZ	19 43 42	7	ePgN	23 20 49	
	e(S)N	44 23		eSgN	57	
4	ePZ	21 37 16±	8	ePZ	05 05 44	
4	ePZ	22 04 51	8	ePZ	06 19 12 c	
	e(S)N	06 25	8	ePZ	14 58 46	
4	ePZ	23 55 35±		eSNE	15 00 33	
5	ePN	00 02 55	8	ePZ	15 23 08	
5	ePN	01 15 15	9	ePgZ	03 20 46±	
5	ePgZ	10 22 43		eSgNE	52	
	eSgNE	44	9	ePgZ	03 34 44±	
5	ePZ	13 37 15		eSgNE	53	
5	ePZE	14 41 19±	9	ePgN	04 15 54	
5	ePgN	14 49 08		eSgN	16 01	
	eSgNE	19	9	eXN	04 37.0	
5	ePZ	15 44 37	9	ePZ	06 42 45	

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Minor Shocks			Minor Shocks			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s	Date	Phase	h m s
9	ePZ	08 38 56						
9	eXN	12 14.3	13	eSgE	23	8	e(P)E	12 22 27
9	ePZ	12 47 06	13	eXE	16 57.0	8	eSE	51
9	ePgZ	20 40 20	13	eXE	17 22.0	8	eXE	12 28.5
	eSgNE	31	13	eXE	20 46 10	8	e(P)E	20 16 50±
10	ePgZ	12 16 50	13	ePE	22 54 40	8	eXE	22 02 46
	eSgN	54	14	eXE	04 09.5	19	ePE	02 48 23
10	ePN	14 17 14	14	ePEZ	08 46 31	19	eSNE	49 39
	eSNE	33	14	ePgE	15 02 56	19	ePE	11 06 38
10	ePgZ	15 52 41	15	eSgE	03 09	22	iSNE	07 02
	eSgZ	53	15	eXE	19 25 54	22	ePE	13 23 21
10	ePZ	16 55 33	15	e(P)E	22 10 11	22	eSN	43
10	ePZ	23 18 49	16	eXE	04 09 39	22	eXE	18 02 36
11	ePZ	00 53 04	16	ePgZ	08 06 35	20	ePE	13 21 45
	eSNE	54 39	16	eSgNE	37	20	eSNE	22 11
11	ePZ	19 45 52	16	ePE	12 22 34	20	eXE	16 58 22
	e(S)N	46 25	16	eSNE	23 00	20	ePE	17 16 01
12	ePZ	00 58 04	16	ePE	23 25 12	20	ePgE	17 32 37
	e(S)NE	30	17	ePE	05 20 52	20	eSgNE	48
12	ePZ	05 26 37±	17	eSNE	21 45	20	eXE	23 34.5
	eSE	28 13	17	eXE	10 21.1	21	ePgE	02 02 58
12	eXE	06 28 06	17	ePgZ	12 52 11	21	eSgNE	03 07
12	ePgE	12 28 00	17	eSgNE	25	21	ePgE	02 44 11
	eSgNE	15	17	ePgE	20 09 46	21	eSgNE	21
12	eXE	14 49.0	17	iSgNE	57	21	eXE	04 09 37
13	ePgZ	04 51 23	17	ePE	20 14 29	21	e(P)Z	05 19 24
	eSgNE	29	17	ePgE	22 34 27	21	ePgE	06 40 56
13	ePZ	05 18 39	17	eSgNE	32	21	iSgNE	58
13	eXE	08 22 56	17	ePgE	23 41 50	21	eXE	07 20 49
13	ePgE	08 50 11	18	eSgE	42 02	21	ePE	13 08 12
			18	ePZ	03 11 04±	21	ePE	18 22 42

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Date	Phase	h m s	Date	Phase	h m s
26	eXZ	03 59 51			
27	ePZ	08 09 01	31	eSgZE	58
	eSNE	26	31	ePZ	02 31 12
27	ePZ	11 42 18	31	ePZ	13 40 53
	eSNE	42	31	ePZ	15 52.0
27	ePgNE	16 02 48	31	ePZ	20 19 05
	eSgNE	51		eSNEN*	28
27	ePE	17 30 16	31	ePZ	21 34 32
	eSE	31 32		eSNE	54
27	ePN	18 56 54	31	ePZ	22 42 03
	eSNE	57 40		eSNE	26
28	ePZ	09 47 14	31	ePZ	23 06 05
	e(S)NE	37		eSNE	27
28	ePZ	15 19 37		Warsak	
	eSE	59	1	iPZ	09 10 35 c
29	ePgZ	08 12 07	2	ePZ	01 36 15
	eSgNE	15	3	ePZ	18 36 59
29	eXE	09 10.0	4	ePZ	10 38 32
29	eXE	09 27.0		iSZ	39 00
29	eXE	09 43 08	4	ePZ	10 41 27
29	eXZ	09 52 57	4	iPZ	16 35 27 d
29	ePgZ	11 25 47		iSZ	53
	eSgNE	49	4	ePZ	20 03 44
29	ePZ	17 13 33 ±		iSZ	04 28
30	eXZ	01 53 36	5	iPZ	06 58 27 d
30	ePZ	03 19 46		iSZ	56
30	ePZ	04 07 02	5	iPZ	08 25 19 c
30	ePZ	12 17 32		iSZ	52
	eSE	18 48	5	iPZ	09 56 35 d
30	ePgZE	21 52 49		iSZ	57 10

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Date	Phase	h m s	Date	Phase	h m s
5	iPZ	14 12 44 d	9	iPZ	20 36 07 d
	iSZ	13 15		iSZ	42
5	iPZ	15 23 04 d	10	ePZ	06 59 54
	iSZ	35		iSZ	07 00 21
5	ePZ	19 40 41	10	ePZ	18 38 57
6	ePZ	09 12 16		iSZ	39 39
	iSZ	13 12	10	iPZ	23 17 57 d
6	ePZ	14 12 15		iSZ	18 32
7	ePZ	01 36 41	11	ePZ	00 52 03
7	iPZ	02 26 48 c		iSZ	52
	iSZ	21 21	11	iPZ	16 44 54 d
7	ePZ	11 48 38		iSZ	45 25
7	ePZ	12 46 54	12	ePN	05 25 31
	ePgZ	12 58 50		eSN	26 13
7	iSgZ	53	12	ePN	12 11 15
	ePZ	14 16 42		eSN	38
8	iSZ	17 44	12	ePN	12 50 19
	ePZ	06 23 20		eSN	42
8	iSZ	59	13	ePZ	04 44 18
	ePZ	09 58 05		iSZ	44
8	ePN	14 57 37	13	ePZ	05 18 35
9	ePZ	03 54 30	13	ePZ	08 49 33
	iSZ	57	13	iPgZ	11 25 18 c
9	iPZ	08 38 27 c		iSgZ	20
9	ePZ	15 00 47	13	ePZ	17 25 37
	iSZ	01 22	13	iPZ	18 53 11
9	iPZ	19 24 42 c		iSZ	52
9	ePZ	20 07 21	13	ePZ	22 54 09
9	iPgZ	20 17 53 d		eSZ	54
	iSgZ	58	15	ePN	20 18 40

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
16	ePN	13 05 14	24	iPZ	15 10 05 c
16	ePN	23 25 07		iSN	30
17	iPZ	08 48 44	24	ePZ	17 27 18
	iSZ	49 12		eSN	28 56
17	ePZ	11 39 48	24	ePZ	18 52 51
	eSN	40 23		iSZ	53 07
17	ePZ	21 51 45	25	ePZ	22 42 16
18	iPZ	02 11 57 d	28	ePZ	05 07 44
18	ePZ	02 42 18		eSZ	08 23
	iSZ	51	28	ePZ	14 33 45
18	ePZ	20 14 03	29	ePZ	18 11 28
	iSZ	57	29	ePZ	21 46 36
19	ePZ	02 18 25		eSZ	47 07
19	iPZ	02 32 18	30	ePZ	00 50 55
	iSZ	50	30	ePZ	02 46 48
19	ePZ	03 27 26	33	iPZ	08 38 46 d
	eSN	56	30	ePZ	21 07 16
20	ePZ	00 03 49		iSZ	50
20	ePZ	02 08 49	31	ePZ	06 30 06
	eSN	09 28	31	ePgZ	09 27 18
20	ePN	16 57 23		iSgZ	24
	eSN	48	31	ePZ	18 06 47
21	ePN	01 40 34		eSZ	08 14
23	ePZ	03 12 10			
	eSN	43			
24	ePZ	11 19 20	3	ePZ	09 34 15
24	ePZ	12 51 05		eSNE	36 35
	eSZ	52 48	3	ePZ	18 35 23
24	ePZ	14 45 02	4	ePZ	16 17 03

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
5	eXE	13 26 25	5	ePZ	22 18 22
10	ePZ	22 00 30		eSE	19 50
20	ePZ	00 03 33	12	eXE	06 34 24
21	ePZ	00 53 57	13	eXE	05 29 13
21	ePZ	23 20 13	13	eXZE	09 40 41
22	ePZ	23 52 34	13	eXZ	09 37 01
24	ePZ	02 51 40		eSE	12
24	ePZ	06 59 25	14	eXZ	10 18 28
24	ePZ	12 50 33		eSE	37
24	ePZ	14 45 07	14	eSZE	10 23 54
24	ePZ	15 10 49	17	iPZ	05 20 03 c
	eSZ	11 51		iSE	20
24	eXZ	17 26 32	21	ePZ	13 07 21
24	e(P)Z	18 54 59		iSE	38
24	ePZ	20 59 05	24	eXZ	07 16 32
27	eXZ	17 30 43		eSE	18 53
28	ePZ	09 11 31	27	ePZ	16 51 48
28	ePZ	14 32 49			
	eSNE	33 19			
				Chittagong	
			2	ePZ	11 37 35
				eSNE	38 27
				ePZNE	15 33 53
3	ePZ	01 10 32	6	eXZ	03 00.9
3	ePZ	18 37 20	7	eXZ	17 18 13
4	ePZ	03 33 31	12	eXE	17 59.8
	iSE	49	12	eXZN	18 51.5
4	ePZ	08 08 13	12	e(P)ZE	17 02 26
	eSZ	25	13	ePZ	09 00 42
5	ePZ	16 39 04	14	e(P)Z	05 13 19
	iSE	17	15		

Seismological Bulletin of Pakistan
Volume 7 No. 12, December 1961

Seism Volun	Date	Phase	h m s	Date	Phase	h m s
		eSNE	14 03			
16	15	ePZE	11 42 36			
17		eSNE	48			
	15	eXNE	13 55.0			
17	15	eXNE	19 07.5			
	15	ePNE	21 28 19			
17		eSNE	32			
18	16	ePNE	07 35 33			
18		eSNE	36 14			
	16	eXN	08 13.0			
18	16	eXNE	09 22.6			
	16	eXNE	12 39 10			
19	17	eXZ	11 15.5			
19	17	eXZ	22 33 27			
	18	ePE	00 44 59			
19		eSZE	45 40			
	18	ePZE	10 46 51			
20		eSE	47 06			
20	19	ePgZE	01 09 44			
		iSgNE	46			
20	19	eXE	04 44.0			
	19	eXNE	06 16.2			
21	20	eXE	17 33.0			
23	27	eXZ	17 05.0			
	28	eXZ	00 05 54			
24	28	eXZ	05 59 07			
24	28	eXZ	06 02 36			
24	28	eXZ	06 54 14			

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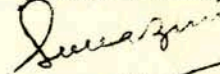
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