

Magn Bull. of Pakistan
Quetta, Vol. 6, No. 5, May, 1960



SEISMOLOGICAL BULLETIN OF PAKISTAN

Vol. 6

MAY 1960

No. 5



Issued under the authority of the Director, Meteorological Service
PAKISTAN METEOROLOGICAL SERVICE
GEOPHYSICAL INSTITUTE
QUETTA

Pakistan Meteorological Service

Director,
Meteorological Service

Sibte Nabi Naqvi

Deputy Director,
Geophysical Institute

Officer Incharge,
Seismological Section

Abdul Qadir Khan

The Seismological Bulletin of Pakistan is a monthly publishing data of seismological stations in Pakistan.

All correspondence regarding the supply of this bulletin on exchange basis should be addressed to the Director, Meteorological Service, Secretariat Block No. 3, Frere Road, Karachi-1, Pakistan.

CONTENTS

1.	Particulars of Stations and Instruments	...	1
2.	Major shocks	...	3
3.	Local and Minor shocks	...	21

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.
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 6 No. 5, May, 1960

				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
1	Qt	ePZ	03 07 50	2	Wr	iPZ	02 44 46 d
		USCGS H 02 55 10				iSN	45 37
		52 1/2 N 166 W			Qt	ePZ	33
		Fox Islands				eSNE	46 59
		Aleutian Islands				H 02 43 41	
1	Qt	ePZ	04 21 58 c			Tadzhikistan, S.S.R.	
		USCGS H 04 11 47		2	Wr	iPZ	04 45 48 d
		0 122 E			Qt	ePZ	46 00
		Celebes		2	Wr	ePZ	05 21 42
1	Wr	ePZ	04 50 04		Qt	ePZ	54
		eSN	51 02			USCGS H 05 11 46	
	Qt	ePZ	50 59			1/2 S 121 E	
		eSNE	52 34			Celebes	
		H 04 48 56		2	Qt	ePZ	08 45 24
		Tadzhikistan, S.S.R.		2	Qt	ePZ	08 54 59
1	Qt	ePZ	17 59 51	2	Wr	ePZ	12 01 35 ±
1	Qt	ePZ	18 14 45		Qt	ePZ	43 c
2	Wr	ePN	01 03 21			eSNEN*	09 51
		eSN	05 51			Mu Sec	
	Lh	ePZ	03 27			PZ 0.1 1.1	
		eSZ	06 02			Δ = 59° 4	
	Qt	ePZ	04 29 c			USCGS H 11 51 34	
		eSNEN*	07 55			0 121 1/2 E	
	Ch	ePZ	04 59 c			Celebes	
		H 01 00 07				Mag 5.8 (Qt)	
		42 1/2 N 84 3/4 E		2	Lh	ePZ	12 19 48 o
		Sinkiang Province				eSN	27 26
		China			Wr	iPZ	20 08 c
		USCGS H 01 00 00			Qt	ePZ	21 c
		44 N 84 1/2 E				eXZ	30
		Sinkiang Province				ePPZE	22 36
		China				eSNN*	28 30

Seismological Bulletin of Pakistan
Volume 6 No. 5, May 1960

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePSEN*			46			Mu			Sec
		ePPSNE			54			PZ 0.1			0.8
		eScSNEN*	30	09				$\Delta = 10^{\circ} 6$			
		cSSN*	32	33		Wr		ePZ	07	02	46
		eLN*	35	1		Ch		ePZ	05	44	
		Mu						ePPZ	06	52	
		Sec						ePPPZ	07	10	
		PZ 0.8	1	5				eSZ	11	00	
		$\Delta = 59^{\circ} 5$									
		USCGS H 12 10 11						H 06 59 05			
		0 121 $\frac{1}{2}$ E						27 $\frac{1}{4}$ N 55 E			
		Celebes						Southern Iran			
		Mag 6.5 (Qt)						USCGS H 06 59 04			
2	Lh	ePZ	18	20	27			29 $\frac{1}{2}$ N 55 E			
	Qt	ePZ	21	08				Iran			
		USCGS H 18 10 49						Mag 6.5 (Qt)			
		40 N 143 E				3	Wr	ePZ	08	00	35
		Near east coast of						ePZ	01	07	d
		Honshu, Japan						Qt	05	55	
								eSNE	06	23	
2	Lh	ePZ	18	29	49			eXNEN*			
	Qt	ePZ	30	31				Mu			Sec
2	Qt	ePKPZ	20	50	26			PZ 0.4			1.6
		USCGS H 20 31 27						$\Delta = 28^{\circ} 6$			
		Kermadec Islands						USCGS H 07 55 07			
		region						29 N 99 $\frac{1}{2}$ E			
2	Qt	ePZ	22	51	22			China			
3	Qt	ePZ	07	01	41 d			Mag 6 (Qt)			
		ePPNE			52	3	Qt	ePZ	08	40	30
		ePPPZNE			57	3	Qt	ePZ	08	45	03
		eSNE	03	42		3	Qt	ePZ	09	14	06
		eSSNEN*			53	3	Qt	ePZ	10	10	40 c
		eLN*	04	2		3	Ch	ePZ	13	29	08
								ePPZ	30	28	

Seismological Bulletin of Pakistan
Volume 6 No. 5, May 1960



Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPPZ			47			$\Delta = 62^{\circ} 0$			
		eSZ	34	44				USCGS H 22 22 41			
	Wr	ePZ	32	04				32 N 140 E			
	Qt	ePZ			16 c			South of Honshu			
		ePcPZE	33	02				Japan			
		ePPZE	34	32				depth about 150 km			
		ePPPZN	35	56				Mag 6 (Qt)			
		eSNEN*	40	25		3	Qt	ePZ	23	57	56 c
		ePSN*			40	4	Qt	ePKPZ	00	15	28
		eScSN*	42	02				USCGS H 23 57 37			
		eSSN*	44	33				19 $\frac{1}{2}$ S 178 $\frac{1}{2}$ W			
		eLN*	47	5				Fiji Islands			
		Mu						depth about 600 km			
		Sec									
		PZ 0.6	1	5		4	Qt	ePZ	10	44	59
		$\Delta = 59^{\circ} 5$				4	Ch	ePZ	18	33	42
		USCGS H 13 22 07					Qt	ePZ			36 46 c
		0 121 $\frac{1}{2}$ E						ePcPZ			37 39
		Celebes						USCGS H 18 26 37			
		Mag 6.4 (Qt)						0 122 E			
								Celebes			
3	Qt	ePZ	14	01	54						
3	Qt	ePZ	14	42	51						
		USCGS H 14 32 34				5	Qt	ePZ	04	24	24
		40 N 143 E				5	Qt	ePZ	11	36	58
		Near east coast of						ePPZ			39 33
		Honshu, Japan						eXNEN*			40 27
3	Wr	ePZ	22	32	11			USCGS H 11 26 00			
		ePPPZ			35 48			52 $\frac{1}{2}$ N 158 $\frac{1}{2}$ E			
	Qt	ePZ			32 46 d			Near east coast of			
		e!XZE			33 11			Kamchatka			
		esPZ			40	5	Qt	ePZ	15	43	50
		Mu				5	Qt	ePZ	17	23	50
		Sec						USCGS H 17 13 30			
		PZ 0.3	1	5				42 N 144 E			

Seismological Bulletin of Pakistan
Volume 6 No. 5, May 1960

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Near east coast of Hokkaido, Japan						Hindukush depth about 200 km			
5	Qt	ePZ	20	53	18	8	Wr	iPZ	13	45	50 d
5	Qt	ePZ	23	14	52			iSN	46	30	
5	Qt	ePZ	23	34	05		Qt	ePZ	46	34	
6	Lh	ePZ	14	03	31			esPZ	58		
				04	29			eSEN*	47	46	
6	Qt	ePZ	18	29	49		Lh	ePZ	46	37	
6	Lh	ePZ	18	57	55			esPZ	47	02	
				58	28			eSN	52		
		USCGS H 18 47 26 54 N 161 E						H 13 45 01 36½ N 68¾ E			
		Near east coast of Kamchatka						Afghanistan depth about 100 km			
6	Qt	ePZ	23	20	00			USCGS H 13 44 56			
7	Qt	ePZ	14	21	34			36½ N 69 E			
		USCGS H 14 11 21 42 N 143 E						Hindukush			
		Hokkaido, Japan				8	Qt	ePZ	14	39	58 c
8	Wr	iPZ	12	24	44 d			eXZ	42	05	
				25	21			USCGS H 14 29 14			
	Lh	ePZ		20				45½ N 151 E			
				26	24			Kurile Islands			
	Qt	ePZ	25	48		9	Qt	ePZ	00	20	34
		e!SZNE	27	18				eXZ	21	37	
		H 12 23 53 37 N 72 E						USCGS H 00 11 10			
		Afghanistan-Tadzhik border depth about 200 km						30½ N 129 E			
		USCGS H 12 23 57 37 N 71 E						Ryukyu Islands			
						9	Wr	iPZ	01	50	04 d
								iSN	34		
								ePZ	51	05	
							Qt	eSN	52	22	

Seismological Bulletin of Pakistan
Volume 6 No. 5, May 1960



Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		H 01 49 24 Hindukush						eSNE	58	53	
9	Ch	ePZ	02	53	10			eLN*	59	2	
				54	30			USCGS H 21 51 55 27 N 47½ E			
	Qt	ePZ	55	59				Northeastern Saudi Arabia			
		USCGS H 02 46 08 5½ N 122 E				10	Qt	ePZ	23	27	17 c
		Celebes Sea						epPZ	38		
9	Ch	ePZ	07	02	00			eSN*	34	43	
	Qt	ePZ	04	36				USCGS H 23 17 57 34 N 131½ E			
		USCGS H 06 53 11 12 N 144 E						Near coast of Western Honshu, Japan depth about 100 km			
		Mariana Islands region depth about 100 km				11	Lh	ePZ	18	46	35
9	Ch	ePZ	09	11	23			ePcPZ	47	11	
	Qt	ePZ	12	36	c			eSN	55	10	
9	Ch	ePnZ	14	37	19		Wr	ePN	46	54	
				28			Kr	ePZ	47	02	
				38	05		Qt	ePZ	11	c	
	Wr	ePZ	40	51				ePcPZN	36		
	Qt	ePZ	41	21				e!PPZ	49	53	
				54				ePPPE	51	18	
				46.4				ePcSE	36		
		H 14 36 30 25 N 90 E						iSNN*	56	17	
		East Pakistan						iPSN*	35		
9	Qt	ePKPZ	20	33	30			eScSN*	57	05	
		H 20 13 25 Pacific Ocean about 900 miles southwest of Galapagos						eSSN*	19	00	44
								iLN*	04.4		
								ePKPPKPZ	15	23	
10	Qt	ePZ	21	55	48			Mu Sec			
								PPZ 0.5 2.5			
								Δ = 69° 3			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	USCGS H 18 36 00							ePPPNN*	25	03	
	3 S 131 E							eSKSNN*	30	14	
	Ceram Sea							eSNN*		26	
	Mag 6½ (Pas), 6.3 (Qt)							eScSNEN*		35	
12	Qt	ePZ	06	31	12			iXN*	31	36	
	USCGS H 06 22 15							eSSN*	36	03	
	5½ S 105½ E							eLN*	42	9	
	Sunda Strait							ePKPPKPZ	46	14	
	depth about 100 km										
12	Qt	ePKPZN	22	51	42						
	eXZ				48						
	ePKSZN*		55	14							
	eSKSZN*		58	58							
	Ch	ePKPZ	52	21							
	USCGS H 22 32 32										
	7½ N 81 W										
	Panama					13	Qt	ePZ	19	05	51
13	Qt	ePZ	08	06	44	14	Qt	ePZ	17	53	23
13	Ch	ePZ	16	19	31						
	ePcPZ				37						
	iXZ				46						
	ePPZ		22	40							
	ePPPZ		24	32		14	Ch	ePZ	22	29	57
	eSZ		29	44							
	eSKSZ				48						
	eScSZ				57						
	Lh	ePZ	19	33			Lh	ePZ	30	18	
	Qt	iPZ	19	54	c		Qt	ePZ		54	c
	ePcPZ				57						
	iXZ		20	09							
	ePPZNE		23	08							

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	USCGS H 22 19 55										
	53½ N 159½ E										
	Kamchatka										
15	Kr	ePZ	13	05	38	16	Ch	ePZ	04	59	25
		iSE			06 01			ePPZ	05	01	07
	Qt	ePZ			05 58 c			eSZ			05 55
		eSNE			06 40						
	H 13 05 02										
	Kalat, Baluchistan					16	Qt	ePZ	14	59	00
15	Ch	iPZ	13	36	13 c	16	Wr	ePN	20	50	03
		ePPZ			37 04			eSN			52
		ePPPZ			15		Qt	ePZ			51 11
		ePcPZ			39 30			eSNE			52 55
		eSZ			40 56						
	Qt	ePZ			39 11 c						
		eSN*			46 17	17	Wr	ePN	01	48	58
	USCGS H 13 30 20							eSN			49 32
	24 N 121½ E						Qt	ePZ			57
	Near east coast of							eSZN			51 18
	Formosa										
15	Wr	ePZ	17	50	17						
		eSN			50						
	Qt	ePZ			51 10	17	Qt	ePZ	09	29	02
		eSNE			52 28						
	H 17 49 28										
	Hindukush										
15	Ch	ePZ	21	49	21						
		ePcPZ			28						
		ePPZ			52 23						
		ePPPZ			54 15						
		eSZ			59 25						
	Qt	ePZ			49 47 c		Lh	ePZ			43 38

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Wr	ePN			56			eXNEN*			27 32
	Qt	ePZ	44	30	c			USCGS H 18 08 45			
		eXE			44			Celebes			
		epPE			57	19	Wr	iPN	02	07	33
		esPE	45	05			Lh	ePZ		08	17
		iXZE			12			esPZ			47
		ePcPZ	46	01				eSN		09	15
		ePPZ			36		Qt	iPZ		08	37 d
		epPPZNE			56			iXZ			57
		ePPPZE	47	50				isPZNNEN*		09	07
		eSNE	51	49				iSNEN*			51
		USCGS H 06 35 09						Mu	Sec		
		29 N 130 E						PZ	2 5	1.8	
		Ryukyu Islands						$\Delta = 6^{\circ}5$			
		depth about 100 km									
18	Qt	ePZ	08	44	04 c		Kr	ePZ	02	09	42
		ePPZE			13			e(sP)E			10 32
		ePPPE			21			eSE			11 42
		eSNN*	46	22			Ch	iPZ			52 d
		eSSN*			35			ipPZ			12 18
		eLN*			47.6			ePPZ			30
		USCGS H 08 40 57						isPZ			34
		27 N 52½ E						ePPPZ			45
		Persian Gulf						iSSZ			16 45
18	Qt	ePZ	14	21	59			H 02 07 02			
		eSNE			24 13			35¾ N 70¾ E			
18	Lh	ePZ	18	18	16			Hindukush			
	Qt	ePZ			46			depth about 130 km			
		eXZ			53			USCGS H 02 07 00			
		ePcPZ	19	36				36 N 71 E			
		ePPZ			20 52			Hindukush			
		eSNE			26 51			depth about 200 km			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Mag 6½ (Qt)						USCGS H 04 14 18			
		Felt Risalpur & Lahore						Persian Gulf			
19	Qt	ePZ	10	20	31 c	20	Qt	ePZ		07	32 01
		eXZE			21 00	20	Qt	eXZ		11	30 22
		ePcPZ			22 05			ePPZ			31 55
		ePPN*			19			eSKSN*			37 45
		ePPPN			23 08			iSKKSN*			38 48
		eXN*			15			ePSEN*			41 18
		eSN*			27 24			i!SKSPNEN*			38
	Lh	ePZ			20 43			USCGS H 11 12 31			
	Wr	ePZ			57			28 S 167½ E			
		USCGS H 10 11 51						Norfolk Islands			
		17 S 66 E						Mag 6½-6¾ (Pas)			
		Mascarene Islands region				20	Wr	ePZ		18	45 40
19	Qt	ePZ	11	00	56			eSN			46 28
19	Qt	ePZ	16	58	43		Qt	ePZ			29
		USCGS H 16 46 10						eSNE			47 56
		53 N 166 W						H 18 44 36			
		Fox Islands						Tadzhikistan			
		Aleutian Islands				21	Qt	ePZ		06	48 45
19	Qt	ePZ	22	22	51			USCGS H 06 41 10			
20	Qt	ePZ	00	35	39 c			37½ N 21 E			
		ePcPZE			44			Near west coast of			
		ePPZNE			38 45			Greece			
		eSN*			45 47	21	Ch	ePZ		08	22 52
		USCGS H 00 23 22						ePPZ			23 39
		3½ S 147½ E						eSZ			27 31
		Near north coast of					Lh	ePZ			25 26 c
		New Guinea					Qt	ePZ			26 14 c
20	Qt	ePZ	04	17	25			ePcPZE			27 31
		eSNN*			19 49			ePPZ			28 16
	Ch	ePZ			21 01 ±						

Seismological Bulletin of Pakistan
Volume 6 No. 5, May 1960

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	USCGS H 08 17 01					21	Qt	PZ	12	07	40
	15½ N 121½ E					21	Qt	ePKPZ	12	41	00 c
	Luzon Islands							USCGS H 12 21 16			
	Philippine Islands							37½ S 73 W			
21	Kr	ePKPZ	10	22	29 c			Chile			
		eXE		25	41	21	Qt	ePKP ₁ Z	13	19	42 c
		ePKSE		26	02			ePKP ₂ Z			54
	Qt	ePKP ₁ Z		22	35 c		Ch	ePKPZ			20 04
		iPKP ₂ Z			45			USCGS H 12 59 58			
		i!XZ		23	15			37½ S 72½ W			
		i!XZ		24	18			Chile			
		ePKSZE		26	09	21	Qt	ePKP ₁ Z	14	19	02 c
		ePPPZNE		29	32			ePKP ₂ Z			11
		eSKSZNE			42		Ch	ePKPZ			24
	Wr	ePKP ₂ Z		22	50			USCGS H 13 59 17			
	Lh	ePKPZ			43			37½ S 72½ W			
	Ch	iPKP ₂ Z		23	31			Chile			
	USCGS H 10 02 50					21	Qt	ePZ	14	46	30
	37½ S 73½ W					21	Qt	ePKP ₁ Z	14	51	41
	Near coast of Chile							ePKP ₂ Z			50
	Mag 7¼-7½ (Berk)							ePKSZ			55 06
21	Qt	ePZ	10	42	29		Ch	ePKPZ			51 59
	Lh	ePZ			55			USCGS H 14 31 55			
21	Qt	ePZ	10	49	50			37½ S 72½ W			
21	Qt	ePZ	10	53	46			Chile			
	Lh	ePZ			57	21	Qt	ePKP ₁ Z	15	28	30
								ePKP ₂ Z			42
21	Qt	ePZ	11	00	51		Ch	ePKPZ			53
21	Qt	ePKP ₁ Z	11	13	34			USCGS H 15 08 45			
	Wr	ePKP ₂ Z			52			37½ S 73 W			
	Lh	ePKPZ			46			Chile			
	Ch	ePKPZ			53						
	USCGS H 10 53 51					21	Qt	ePZ	15	54	17
	37½ S 72½ W							eXZ			57 57
	Chile										

Seismological Bulletin of Pakistan
Volume 6 No. 5, May 1960

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
21	Qt	ePKP ₁ Z	19	26	07			37½ S 73 W			
		ePKP ₂ Z			19			Chile			
	Ch	ePKPZ			24	22	Qt	ePKP ₁ Z	10	50	21 c
		USCGS H 19 06 21						ePKP ₂ Z			31
		Chile						Wr	ePKP ₂ Z		35
21	Qt	ePZ	22	46	24		Ch	ePKPZ			39
21	Qt	ePZ	23	58	39			USCGS H 10 30 39			
22	Qt	ePZ	01	07	34			38 S 73½ W			
22	Qt	ePZ	01	12	05			Near coast of Chile			
22	Qt	ePZ	01	50	43			Mag 6½ (Pas), 6¼ (Berk)			
22	Qt	ePZ	03	52	26	22	Qt	ePKP ₁ Z	10	52	24
22	Qt	ePKP ₁ Z	04	06	08			ePKP ₂ Z			32
		ePKP ₂ Z			17			i!XZ			41
		ePKSZ			09 35			ePKSZ			55 50
	Lh	ePKP ₂ N			06 31		Wr	iPKP ₂ Z			52 42
	Ch	ePKPZ			27		Ch	ePKPZ			41
		USCGS H 03 46 22						USCGS H 10 32 43			
		37½ 73 W						37½ S 73 W			
		Chile						Near coast of Chile			
22	Qt	ePZ	06	35	28			Mag 7¼-7½ (Pas),			
22	Qt	ePKPZ	06	21	22			7 (Berk)			
		ePKSNE			24 55	22	Qt	ePZ	11	05	21
		USCGS H 06 01 36						USCGS H 10 56 59			
		38 S 73½ W						19 N 121½ E			
		Chile						Babuyan Islands			
22	Qt	ePZ	07	26	59			depth about 200 km			
22	Qt	ePZ	07	55	45	22	Qt	ePZ	11	55	57
22	Qt	ePKP ₁ Z	08	30	36	22	Qt	ePKPZ	12	36	27
		ePKF ₂ Z			44			iXZ			49
		e!XZ			33 58			USCGS H 12 16 43			
		ePKSZNE			34 12			38 S 73 W			
		USCGS H 08 10 53						Chile			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
22	Qt	ePZ	13	22	39			Near coast of Chile			
22	Qt	ePZ	17	32	18			Mag $8\frac{1}{4}$ - $8\frac{1}{2}$ (Pas),			
22	Qt	ePZ	18	27	59			$8\frac{1}{2}$ (Berk)			
22	Qt	ePKPZ	19	15	40 ^c			Phases at Quetta and			
		ePKSZ	19	10				other stations could not			
		ePPPZ	22	30				be timed due to large			
Wr		ePKP ₂ N	15	55				amplitudes and over-			
Lh		eXZ		54				lapping of the preceding			
		ePPZ	19	35				shocks.			
Ch		ePKPZ	15	57		22	Qt	ePZ	20	36	40
		ePKSZ	19	29		22	Qt	ePZ	20	51	33
		ePPZ	20	18		22	Qt	ePZ	21	19	15
		eSKSZ	22	59		22	Qt	ePZ	21	32	20
		ePPPZ	24	01		22	Qt	ePZ	21	50	26
		eSKKSZ	27	05		22	Qt	ePZ	22	27	11
		USCGS H 18 55 57						eXZ		19	
		38 S 73 $\frac{1}{2}$ W						Ch		24	
		Near coast of Chile				22	Qt	ePZ	22	33	48
		Mag $7\frac{3}{4}$ (Pas)				22	Wr	ePN	22	36	03
22	Qt	eXZ	19	30	20			iSN		31	
		e!PKPZ		28				Qt		55	
Lh		ePKPZ		40				eSZN		56	
Ch		ePKPZ		47				eSZN		38	03
		iXZ	31	09				H 22 35 25			
		USCGS H 19 10 47				22	Qt	ePZ	22	41	07
		38 S 73 $\frac{1}{2}$ W				22	Qt	ePZ	22	52	07
		Near coast of Chile				22	Qt	ePZ	23	06	13
		Mag $7\frac{1}{2}$ - $7\frac{3}{4}$ (Berk)				22	Qt	ePZ	23	15	30
Ch		ePKPZ	19	31	20		Lh	ePZ		16	07
		USCGS 19 11 20				22	Qt	ePZ	23	26	42
		38 S 73 $\frac{1}{2}$ W				22	Qt	ePZ	23	32	21
						22	Qt	ePKP ₂ Z	23	49	11

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 23 29 18						USCGS H 02 46 30			
		39 $\frac{1}{2}$ S 72 W						41 $\frac{1}{2}$ S 73 $\frac{1}{2}$ W			
		Chile						Southern Chile			
22	Qt	ePZ	23	52	19	23	Qt	ePKPZ	03	16	03
22	Qt	ePZ	23	54	40			ePKP ₂ Z		13	
22	Qt	ePZ	23	58	31			ePKSZN		19	37
	Ch	ePZ		44				USCGS H 02 56 17			
23	Qt	ePZ	00	15	49			43 S 75 $\frac{1}{2}$ W			
23	Qt	ePZ	00	30	45			Near coast of Chile			
23	Qt	ePKPZ	00	45	28						
		USCGS H 00 25 44				23	Qt	ePZ	04	39	51
		38 $\frac{1}{2}$ S 75 W				23	Qt	ePZ	04	44	49
		Near coast of Chile				23	Qt	ePKP ₂ Z	05	33	17 ^c
23	Qt	ePZ	01	01	25			ePKP ₂ Z		26	
23	Qt	ePZ	01	03	52			iXZ		32	
	Lh	ePZ		04	00			ePKSZN		36	51
23	Qt	ePKPZ	01	10	55		Wr	ePKP ₂ Z		33	31
		USCGS H 00 51 12					Ch	ePKPZ		35	
		37 $\frac{1}{2}$ S 72 W						USCGS H 05 13 35			
		Chile						38 S 73 $\frac{1}{2}$ W			
23	Qt	ePZ	01	21	26			Chile			
23	Qt	ePZ	01	32	07	23	Qt	ePZ	06	07	42
		eXZ		35	34	23	Qt	ePKP ₂ Z	07	29	00 ^c
23	Qt	ePZ	01	43	18			i!PKP ₂ Z		09	
23	Qt	ePKPZ	01	54	36			ePKSZ		32	35
		USCGS H 01 34 53						ePKP ₂ Z		29	15
		39 $\frac{1}{2}$ S 74 W						Lh		ePKPZ	06
		Near coast of Chile						USCGS H 07 09 17			
23	Qt	ePZ	02	03	41			48 S 77 W			
23	Qt	ePKPZ	03	06	13 ^c			Off coast of Chile			
		eXZ		09	35	23	Qt	ePKP ₂ Z	08	32	58
	Ch	ePKPZ		06	26			ePKP ₂ Z		33	13

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	USCGS H 08 13 15 40½ S 75½ W Near coast of Chile						Lh	ePZ	01	01	
23	Qt	ePKP ₁ Z ePKP ₂ Z ePKSZ	10	12	02	24	Qt	ePZ	03	06	58
	Wr	ePKP ₂ Z	12	14			Ch	ePZ	07	12	
	Lh	ePKPZ ePPN	13 16		02	24	Qt	ePZ	05	17	09
	USCGS H 09 52 20 37½ S 73 W Chile					24	Ch	ePZ		22	
23	Qt	ePKP ₁ Z ePKP ₂ Z	10	57	42	24	Qt	ePZ	08	11	12
	Wr	ePKP ₂ Z	58	00		24	Wr	ePN	08	33	01
	Lh	ePKPZ	57	49			Qt	ePZ		34	02
	USCGS H 10 37 59 43½ S 73½ W Chile					24	Qt	ePZ	14	26	33
23	Qt	ePZ	14	20	10	24	Ch	ePZ	15	00	12
	Lh	ePZ		16			Qt	ePKPZ		05	17±
	Wr	ePN		48				ePPZ		06	03
23	Qt	ePZ	16	04	36			ePKSN*		08	50
	Lh	ePZ		54				eSKSN*		12	22
23	Qt	ePZ	16	43	19			e!SKSPN*		16	22
	Lh	ePZ		15				ePPSN*		17	43
23	Qt	ePZ	19	14	59			e!SSN*		22	13
	Lh	ePZ		15	13			USCGS H 14 46 34 44½ S 167½ E South Island New Zealand Mag 6¼-7 (Pas), 6¼-6½ (Berk)			
23	Qt	ePZ	23	02	02	24	Qt	ePZ	15	35	44
23	Qt	ePZ	23	32	58	24	Qt	ePZ	15	45	05
24	Qt	ePZ	02	00	39	24	Qt	ePZ	16	04	14
						24	Qt	ePZ	19	29	40
						24	Qt	ePKPZ	20	52	19
								ePPZ		55	37
							Wr	ePKP ₂ Z		52	35
							Ch	ePKPZ		37	

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	USCGS H 20 32 43 50½ S 74 W Southern Chile						Qt	ePZ	49	13	c
25	Qt	ePZ	00	39	02		USCGS H 13 38 28 1 N 129½ E Halmahera				
25	Qt	ePZ	01	09	56	25	Qt	ePZ	14	16	52
25	Qt	ePZ	03	35	51		eSNE		17	49	
	Ch	ePZ		36	11		Kr	ePZ		16	53
25	Qt	ePKPZ	05	03	52		H 14 15 37 Southeastern Iran				
	USCGS H 04 44 06 Southern Chile					25	Qt	ePZ	14	38	23
25	Qt	ePZ	06	53	21		USCGS H 14 27 38 1 N 128½ E Halmahera				
	Ch	ePZ			35	25	Qt	ePKPZ	15	17	05
25	Kr	ePKPZ	08	54	18±		USCGS H 14 59 12 22 S 179½ W Fiji Islands depth about 600 km				
	Qt	ePKPZ			19		Qt	ePZ	18	39	54
		iPKP ₂ Z			28	25	Qt	ePKPZ	19	41	35
		iXZ			45		Lh	ePKPZ			44
		ePKSN*			57		USCGS H 19 21 48 40 S 75½ W Chile				
		eSKSN*	09	01	25	25	Qt	ePZ	22	28	55 c
	Wr	ePKP ₂ Z			54		Lh	ePZ		29	04
	Lh	ePKPZ			30		Qt	ePZ	00	21	06
	USCGS H 08 34 33 45 S 76 W Off coast of Chile Mag 6¼ (Pas), 6½-6¾ (Berk)					26	Qt	ePZ	01	30	51
25	Qt	ePZ	10	19	17	26	Qt	ePZ	01	48	54
25	Qt	ePZ	12	52	45	26	Qt	ePZ	05	17	39
		ePPZ			53			ePPZE		19	10
		ePPPZ			53			eSZNEN*		23	39
		eSNE			54			eLN*		26	2
	Wr	ePN			53			ePN		17	56
	H 12 50 12 Southern Iran					25	Lh	ePZ	13	48	33

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Kr	ePZ	18	02				Felt Sylhet, Rangpur & Bogra			
		USCGS H 05 10 05									
		40 N 20 E									
		Albania-Greece border									
		Mag 6½ (Pas)									
26	Qt	ePZ	07	02	52	26	Qt	ePZ	23	18	45
26	Qt	ePZ	15	26	05	27	Qt	ePZ	00	55	54 d
26	Qt	ePZ	17	23	09	27	Qt	ePZ	01	19	27
26	Qt	ePZ	18	12	08	27	Qt	ePKPZ	03	37	07
26	Qt	ePZ	19	33	13			ePKP ₂ Z			17
26	Qt	ePZ	12	53	36			USCGS H 03 17 21			
26	Ch	ePZ		48				41 S 76 W			
26	Ch	ePnZ	20	06	16			Off coast of Chile			
		eP*Z		25		27	Qt	ePZ	03	54	51
		iXZ		57		27	Qt	ePZ	04	31	06
Lh	ePZ		08	59		27	Qt	ePZ	08	16	48
		eSZ		11	58	27	Qt	ePZ	10	44	33
Wr	ePN		09	41		27	Qt	ePZ	11	46	29
Qt	ePZ		10	15	c	27	Qt	ePZ	18	44	46
		eXZ		33		27	Qt	ePnZ	20	16	07
		ePPZ		43				ePgZ		18	
		e!SNEN*		14	22			eSnZNN*		46	
		eSSEN*		15	05			eSgE		56	
		eLN*		15	7			ePN		17	17
		Mu Sec					Wr				
	PZ	0.3	1.2					H 20 15 15			
		Δ=23°						Southern Afghanistan			
Kr	ePZ		20	10	17	27	Lh	ePZ	20	22	13
	iLE			15	8		Qt	ePZ		45	c
		H 20 05 08						USCGS H 20 10 00			
		26½ N 93½ E						5½ S 153 E			
		Assam						New Britain region			
		USCGS H 20 05 07						depth about 150 km			
		27 N 93 E				27	Qt	ePKP ₁ Z	23	26	39 d
		Eastern India						ePKP ₂ Z			49
		Mag 5.7 (Qt)					Lh	ePKSZN			30 11
								ePKPZ			26 43
								USCGS H 23 06 55			
								45 S 77 W			
								Off coast of Chile			



Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
27	Qt	ePZ	23	40	18			USCGS H 07 39 29			
28	Qt	ePZ	03	22	16			38 S 72½ W			
28	Qt	ePKP ₁ Z	03	25	35			Chile			
		ePKP ₂ Z			44			Mag 6½ (Pas), 6¼ (Berk)			
		ePPZ		29	00	29	Lh	ePZ	08	28	14
		USCGS H 03 05 53					Qt	ePZ		29	04 d
		39½ S 74½ W						USCGS H 08 20 01			
		Chile						25½ N 124½ E			
28	Qt	ePZ	06	25	48 c			Ryukyu Islands			
28	Qt	ePZ	11	03	51	29	Qt	ePKP ₁ Z	08	54	04 c
28	Qt	ePKP ₁ Z	11	25	23 c			ePKP ₂ Z			13
		ePKP ₂ Z			34			ePKSZ			57 36
		ePPZN		28	56		Wr	ePKP ₂ N			54 25
	Wr	ePKP ₂ Z		25	47		Lh	ePKPZ			14
		USCGS H 11 05 40						USCGS H 08 34 20			
		38 S 72½ W						37½ S 73 E			
		Chile						Southern Chile			
		Mag 6½ (Pas), 6¼ (Berk)				29	Qt	ePZ	10	37	24
28	Qt	ePZ	11	59	20	29	Qt	ePKP ₁ Z	14	25	07 c
28	Qt	ePZ	18	16	52			ePKP ₂ Z			10
28	Qt	ePZ	18	48	01			ePKSZNE			28 39
29	Qt	ePZ	02	11	03		Wr	ePKP ₂ N			25 30
29	Qt	ePZ	03	53	04		Lh	ePKPZ			15 c
29	Qt	ePZ	05	46	36			USCGS H 14 05 25			
29	Kr	ePKPZ	07	59	03			37½ S 73 W			
	Qt	iPKP ₁ Z			12 c			Near coast of Chile			
		ePKP ₂ Z			22	29	Lh	ePZ	20	07	06
		e!XZ		08	01 07		Wr	ePN			36±
		ePKSZE		02	45		Qt	ePZ			41
	Wr	ePKP ₂ Z		07	59 24			USCGS H 19 57 30			
	Lh	ePKPZ			20 c			0 121½ E			
	Ch	ePKPN*			24			Celebes			

Seismological Bulletin of Pakistan
Volume 6 No. 5, May 1960

Date	Station	Phase	h	m	s
29	Qt	ePZ	20	43	59
29	Kr	ePKPZ	21	43	32
	Qt	ePKP ₁ Z		41	c
		ePKP ₂ Z		52	
	Wr	ePKP ₂ N	43	56	
	Lh	ePKPZ		52	
USCGS H 21 23 54 Near coast of southern Chile					
29	Qt	ePZ	21	59	23 c
	Wr	ePZ		36	
	Lh	ePZ		42	
29	Qt	ePZ	23	38	56
30	Qt	ePZ	02	41	03
	Ch	ePZ		08	
30	Qt	ePZ	07	13	35
USCGS H 07 01 15 53½ N 164 W Unimak Islands region					
30	Qt	ePZ	07	20	18
30	Qt	ePKPZ	08	48	32
		eXZ		50	48
USCGS H 08 29 27 32 S 177½ W Kermadec Islands region					
30	Qt	ePZ	11	22	07
30	Qt	ePZ	11	28	33
30	Qt	ePZ	16	15	14
USCGS H 16 05 59 Near southwest coast of Luzon					
30	Qt	ePZ	17	05	31

Major Shocks

Date	Station	Phase	h	m	s
30	Lh	ePZ	18	06	07
	Qt	ePZ		22	
31	Qt	ePZ	00	28	16 c
		ePPZNN*		33	
		eXN*	29	48	
		e!SN*	31	52	
		eSSN*	32	15	
		eLN*	33	0	
	Lh	ePZ	28	40	c
	Ch	ePZ	29	25	
H 00 23 43 10½ N 67½ E Arabian Sea					
31	Qt	ePKP ₁ Z	02	59	46 d
		ePKP ₂ Z		58	
		eXZ	03	02	52
USCGS H 02 40 00 39½ S 75 W Chile Mag 6 (Berk)					
31	Qt	ePKPZ	11	20	54
		ePPZE		21	34
		ePPPNE		23	55
		ePKSZE		24	28
		e!SKSNEN*		27	30
		e!XN*		29	10
		ePSN*		31	05
		eSSN*		36	52
USCGS H 11 02 20 18 N 62 W Lecward Islands Mag 6½-6¾ (Pas), 6¾ (Berk)					



Seismological Bulletin of Pakistan
Volume 6 No. 5, May 1960

Date	Station	Phase	h	m	s
31	Qt	ePZ	11	31	50
		eXZ		32	01
31	Lh	ePZ	13	23	46 c
	Qt	ePZ		24	17 c
		eXZ		30	
		ePPZN		28	00
		ePPPZ		29	58
USCGS H 13 11 02 7½ S 156 E Solomon Islands					
31	Qt	ePZ	16	39	33
	Lh	ePZ		47	
	Wr	ePZ		58	
31	Qt	ePZ	20	23	18
	Lh	ePZ		32	
31	Lh	ePZ	21	08	44 d
	Wr	ePZ		09	12
		eSN		16	01
	Qt	ePZ		09	17 d
		eXZ		27	
		e!XZ		10	12
		epPZ		11	05
		ePPZ		29	
		iSNEN*		16	10
		esSN*		19	26
		Mu		Sec	
		PZ	0.2	1.0	
		Δ = 54°·5			
USCGS H 21 00 40 5½ S 109 E Java Sea depth about 600 km Mag 5.3 (Qt)					

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	Quetta		3	ePgZ	15 48 45
1	eXZ	00 54.3		eSgNE	56
1	eXZ	00 59.5	3	ePgZ	17 21 53
1	eXN	01 20.0		eSgNE	12
1	ePgZ	03 29 33	3	ePZE	22 50.0
	eSgZNE	36	4	eXE	00 00 25
1	ePZ	08 00 47	4	ePgZE	18 05 50.4
	eSNE	01 09		eSgZNE	51.6
1	eXZ	18 54 48	4	ePZE	18 17 38
1	ePZ	23 54 56	5	ePgZ	01 29 43
	eSNE	55 25		eSgNE	54
2	eXE	14 45 33	5	eXZ	09 34 12
2	ePE	15 23 02	5	ePgZ	12 35 40
	eSE	21		eSgE	56
2	ePgZ	15 33 03	5	ePZE	14 56 36
	eSgZE	06		eSE	58 39
2	ePgE	16 44 52.5	5	ePZ	18 54 18
	eSgZ	55.9		eSNE	48
2	ePgZ	21 15 08.7d	5	ePZ	21 03.0
	iSgNE	10.6	6	ePZ	23 53 15
2	ePgZE	21 16 50.1	7	eXZ	04 39 06
	eSgZE	52.5	7	ePgZ	06 05 09
2	ePgZE	21 17 42		eSgN	13
	eSgE	45	7	ePgZ	08 05 34.2
2	ePgE	21 19 52.5		eSgNE	38.3
	eSgE	55.4	7	ePgZ	09 28 27.4
3	iPgZ	11 02 50.3c		eSgN	31.5
	iSgZ	54.3	8	ePZ	01 31 49
3	ePgZNE	11 36 30.0	8	ePgZ	05 18 22.1
	eSgZNE	34.4		eSgN	26.1
3	ePgZNE	11 36 57.5	8	ePgZ	05 23 24.9
	iSgZNE	37 01.5		eSgN	28.9



Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
8	iPgZ	06 56 44.8c	18	eXZ	05 04.0
	iSgN*	48.8	18	eXZN	06 44 09
8	ePgZ	07 09 10	18	ePZ	06 51 47
	eSgN	14		eSN	52 08
9	ePgZE	10 13 09.0	18	eXZ	11 57.3
	eSgZE	11.3	18	ePZ	18 18 14
9	ePgZ	11 16 54		eSN	59
	eSgNE	17 08	18	ePZ	22 38 43
9	ePZ	12 35 00 d		eSN	40 00
	iSNE	23	19	ePZ	08 14 44
10	ePgZE	01 28 18.8	19	eXZ	09 36 42
	eSgNE	22.4	19	eXZ	09 44 49
10	eXZ	14 22 43	19	ePZ	12 14 00
11	ePN	05 35 44	20	eXZ	09 07 00
	eSZN	37 03	20	ePZ	16 31 12
12	ePZ	15 16 22 c		eSNE	33
	eSNE	49	20	eXZN	17 13 47
12	eXZ	23 04 12	20	ePZ	18 37 54
13	eXZ	10 14 41		eSN	38 48
13	eXZ	21 06 12	21	eXZ	07 23.6
15	eXZ	01 41.5	21	eXZ	11 22 37
15	ePZ	03 03 15	21	ePZ	11 37 26
16	ePZ	19 55 11±	21	ePZ	11 47 24±
16	ePZ	20 05 23±		eXZ	30
17	ePgZ	13 20 38	21	ePZ	12 15 59
	eSgNE	49	21	ePZ	12 24 47
17	ePZ	15 58 21 d	21	ePZ	13 06 34
	eSN	19	21	ePZ	13 26 33
17	ePgZ	20 46 00	21	eXZ	13 50 10
	eSgZN	14	21	ePZ	14 08 27
18	ePZ	03 44 44	21	eXZ	15 03 02
	eSN	45 11	21	ePZ	15 06 34

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
21	eXZ	15 26 34	22	eXZ	22 32 37
21	ePZ	17 02 14	22	ePZ	23 01 25
21	ePZ	17 12 17	22	ePZ	23 11 20 [±]
21	ePZ	17 37 39	22	ePZ	23 23 29
21	ePZ	19 12 04	23	e(P)Z	00 02 07
	eSN	57	23	ePZ	00 04 30
21	eXZ	19 44 16	23	eXZ	00 14 39
21	ePZ	20 23 20	23	eXZ	00 27 39
	eSN	24 38	23	eXZ	01 27 57
21	ePZ	21 36 47	23	ePZ	01 41 17
21	ePZ	22 23 21	23	ePZ	02 02 25
	eXZ	27	23	ePZ	02 41 19
21	ePZ	23 36 59	23	ePZ	02 45 31
22	ePZ	00 52 22	23	ePZ	02 56 53
22	ePZ	01 05 48	23	ePZ	03 03 21
22	ePZ	03 26 21	23	eXZ	03 22 48
	eXZ	29		eXZ	53
22	eXZ	11 02 06	23	eXZ	03 31 56
22	ePZ	11 46 46	23	ePZ	03 37 32
22	ePZ	12 25 16	23	eXZ	03 41 59
22	ePZ	12 50 01		eXZ	44 40
22	ePZ	13 36 20	23	eXZ	03 52 46
22	eXZ	14 58 39	23	eXZ	04 07 05
	eXZ	46	23	ePZ	04 19 42
22	ePZ	16 56 03		eXZ	24 44
22	ePZ	17 18 40	23	eXZ	04 27 32
	eSZN	19 01	23	eXZ	04 58 33
22	ePZ	20 15 53 [±]	23	ePZ	05 07 36
22	ePZ	20 26 41 [±]	23	eXZ	05 12 36
22	eXZ	22 04 44	23	eXZ	05 31 04
22	eXZ	22 11 52	23	eXZ	05 43 32
22	eXZ	22 17 53	23	ePZ	06 01 22



Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
23	eXZ	06 27 53	23	eXZ	15 54 32
	eXZ	30 10	23	eXZ	16 01 35
23	ePZ	06 33 31	23	eXZ	17 22-0
23	eXZ	06 45 10	23	eXZ	17 46 28
23	eXZ	06 52 19	23	eXZ	18 04 42
23	ePZ	06 58 08	23	eXZ	18 24 28
23	eXZ	07 05 45	23	eXZ	19 20 24
23	ePZ	07 34 46	23	ePZ	19 28 51
23	eXZ	07 44 49	23	ePZ	19 46 02
23	e(P)Z	07 44 59		eXZ	53 25
23	eXZ	07 51 18	23	ePZ	20 04 01 [±]
23	eXZ	08 02 59	23	eXZ	20 13 28
23	eXZ	08 15 55	23	eXZ	20 19 28
23	eXZ	08 41 51	23	eXZ	20 42 06
23	ePZ	08 53 35	23	ePZ	20 53 16
23	eXZ	09 06 03	23	eXZ	21 00 34
23	eXZ	09 23 41	23	ePZ	21 27 18
23	eXZ	09 44 29	23	ePZ	21 33 34
23	ePZ	10 05 10	23	ePZ	21 42 32
23	eXZ	10 29 48	23	ePZ	22 00 37
23	eXZ	10 50 19	23	ePZ	22 25 23
23	eXZ	11 42 12	23	eXZ	22 28 40
23	eXZ	12 01 36	23	eXZ	22 32 45
23	eXN	12 04 55	23	eXZ	23 48
23	eXN	12 22 15	23	eXZ	23 50 46
23	eXN	13 01 30	24	ePZ	00 46 04
23	eXZ	13 32 12	24	ePZ	01 03 25
23	eXZ	13 39 18		eXZ	28
23	eXZ	13 47 11	24	ePZ	01 20 23
23	eXZ	14 31 42	24	ePZ	01 57 18
23	eXZ	15 21 55	24	eXZ	02 52 49
23	ePZ	15 37 40	24	eXZ	03 05 34

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
24	ePgZN	03	10	49	24	eXZ	20	28	19
	eSgZN		11	00	24	e(P)Z	20	51	09
24	ePZ	03	43	42	24	eXZ	22	17	03
24	ePZ	04	06	20	24	ePZ	22	30	06
	eXZ		08	49	24	ePZ	22	39	57
24	eXZ	04	13	43	24	ePZ	22	57	37
24	ePZ	04	38	29	24	eXZ	23	17	28
24	eXZ	05	06	19	24	ePZ	23	42	46
24	ePZ	05	09	00	25	ePZ	00	15	25
24	eXZ	06	14	57	25	eXZ	00	20	14
24	eXZ	06	22	07	25	eXZ	00	31	55
24	eXZ	06	39	50	26	ePZ	00	47	04
24	eXZ	06	50	00	25	eXZ	01	12	58
24	ePZ	07	20	18	25	eXZ	01	28	14
24	ePZ	09	27	03	25	eXZ	01	38	43
24	ePZ	09	47	08	25	eXZ	01	55	0
24	ePZ	10	27	03	25	e(P)Z	02	49	38
24	ePZ	10	41	29	25	ePZ	02	59	50
24	ePZ	11	08	54	25	eXZ	04	01	45
	eXZ		13	47	25	ePZ	04	15	10
24	ePZ	15	25	33	25	eXZ	05	52	02
24	ePZ	15	50	51	25	ePZ	06	26	28
24	ePZ	15	59	18	25	ePZ	07	03	19
	eSZN			43	25	eXZ	07	21	08
24	ePZ	16	20	53	25	eXZ	08	25	07
24	ePZ	16	29	35	25	e(P)Z	09	31	00
24	ePZ	18	10	50	25	ePZ	10	09	19
24	ePZ	18	15	14	25	e(P)Z	10	32	27
24	eXZ	19	24	00	25	e(P)Z	14	42	01
24	ePZ	19	57	52		eXZ			23
	eSZN		58	14	25	ePZ	15	11	42
24	eXZ	20	18	45	25	eXZ	16	04	30±

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
25	ePZ	16	27	35	26	ePZ	19	07	28
25	ePZ	17	06	31±	26	ePZ	19	36	46
25	ePZ	17	39	11	26	ePZ	22	07	45
25	ePZ	18	12	03	27	ePZ	00	16	56
25	e(P)Z	18	22	27	27	eXZ	00	59	24
	eXZ			44	27	eXZ	01	10	27
25	eXZ	21	16	40	27	ePZ	01	30	33
25	e(P)Z	21	23	54	27	ePZ	04	48	21
25	eXZ	21	37	15	27	ePZ	07	15	10
25	eXZ	22	47	51	27	ePZ	08	23	39
	eXZ			54	27	eXZ	09	19	57
25	ePZ	22	50	35	27	ePZ	10	17	58
	eSZN			51 00		eSZN			18 27
25	eXZ	23	12	42	27	ePZ	10	48	37
25	ePZ	23	13	04±	27	eXZ	10	55	0
	eXZ			06	27	ePZ	14	22	31
25	ePZ	23	14	32	27	ePZ	16	09	29
25	ePZ	23	22	31	21	eXZN	18	08	55
25	e(P)Z	23	38	08	27	ePZ	18	26	38
26	ePZ	05	23	36±	27	ePZ	22	10	06
	ePZ			38	27	ePZ	22	15	54
26	ePZ	06	54	29		eSN			17 10
26	ePZ	07	00	56	27	ePZ	22	33	51
26	eXZ	07	39	51	27	ePZ	23	15	25
26	e(P)Z	08	03	42	28	ePZ	01	45	54
	ePZ			45	28	e(P)Z	02	32	44
26	eXZ	14	40	0	28	ePZ	05	21	44
26	ePZ	16	24	42	28	ePZ	07	14	49
	eSZN			26 11	28	ePZ	07	40	14
26	ePZ	18	23	57	28	eXZ	08	15	6
26	ePZ	18	49	25	28	ePZ	09	47	15
						eSN			48 32

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
28	e(P)Z	13 20 36	30	ePZ	04 17 38
28	ePZ	16 11 55±	30	ePZ	09 44 06
	ePZ	58		e(P)Z	08
28	ePZ	16 48 44±	30	eXZ	11 01·0
	ePZ	49	30	ePZ	12 16 22
28	eXZ	17 07 44		eSN	18 39
28	ePZ	19 45 12±	30	ePZ	16 06 41
28	eXZ	22 04 07	30	eXZ	19 43·0
28	e(P)Z	22 19 54	30	eXZ	21 57 46
29	ePZ	00 29 33	30	ePgZ	22 20 25·9
29	ePZ	01 48 11		eSgN	29·7
29	ePZ	02 52 19	30	ePgZ	22 30 41·3
29	ePZ	04 48 45		eSgN	45·2
	eSN	50 12	30	ePZ	22 35 05
29	eXZ	05 11 53	31	ePZ	01 26 43
29	eXZ	05 40 51	31	ePZ	03 59 30
29	ePZ	07 13 48		e(S)N	04 00 05
29	eXZ	09 53 04	31	ePZ	04 16 33 c
	eXZ	54		eSNE	17 04
29	ePZ	11 14 12	31	ePZ	04 53 01
29	ePZ	13 55 40	31	ePZ	19 21 10
29	eXZ	19 07 06	31	ePZ	20 36 10
29	ePgZ	19 08 26·0	31	ePZ	23 15 11
	eSgN	29·3			
29	ePZ	19 21 22	1	Warsak	
29	ePZ	19 58 59		ePZ	01 44 13 c
	eXZ	59 43	1	eSZ	44
	eXZ	20 00 34		ePZ	04 54 47
30	eXZ	00 36 38	1	eSZ	55 20
30	eXZ	00 40 36		ePZ	09 41 14
30	ePZ	01 27 47	1	iSZ	45
30	ePZ	03 17 14		ePZ	22 44 17
				iSZ	50



Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
1	ePZ	23 54 47 d	19	ePN	16 54 55
	eSN	55 14	20	ePN	18 37 10
2	iPZ	06 14 12 d	24	ePN	12 06 38
	iSN	44		eSN	07 10
2	ePZ	23 55 09	24	eXN	15 05 32
3	ePZ	04 23 35	26	ePN	01 37 40
	iSZ	24 02	27	ePN	09 19 03
4	ePZ	16 13 46		eSN	46
	eSZ	14 09	27	ePN	22 14 52
5	ePZ	06 48 19	28	ePN	09 46 25
	iSZ	49		eSN	55
5	ePZ	13 22 03	29	ePN	01 45 51
	iSZ	31	29	ePN	04 47 49
5	iPZ	14 55 11 d	30	ePN	02 26 28
	iSZ	56 36		iSN	29 03
6	ePN	06 52 01	30	ePN	07 44 50
	eSN	30		iSN	45 29
6	ePZ	13 58 56		Lahore	
	eSN	59 12	1	eXZ	04 53 06
8	ePN	15 56 54	2	eXZ	02 46 01
	iSZ	57 28	5	eXZ	11 36 37
8	ePZ	18 40 06	5	ePZ	19 05 28
	iSN	44	9	eXZ	14 44 23
11	ePN	05 34 42	20	eXZ	07 27 03
	eSN	35 09	20	eXZ	11 30 25
11	ePN	16 16 27	21	ePZ	10 42 55
	eSN	17 01	22	eXZ	12 36 43
12	ePN	10 26 02	22	eXZ	21 52 04
	eSN	13	22	eXZ	22 26 55
15	ePN	18 50 17	22	ePZ	22 49 25
	eSN	50	22	eXZ	22 58 42
19	ePN	15 23 44	22	ePZ	23 45 39

Minor Shocks



Date	Phase	h m s	Date	Phase	h m s
23	ePZ	00 01 43	4	eXZ	00 10 58
23	eXZ	00 11 14	5	ePZ	03 59 49
23	eXZ	00 54 53	5	ePZ	17 21 50±
23	ePZ	09 46 14	6	eXZ	06 42 47
23	ePZ	14 20 16	6	ePZ	18 47 42
24	eXZ	16 05 26	11	eXZ	18 44 56
27	eXZ	20 14 52	12	eXZ	19 22 33
27	ePZ	21 08 54	13	ePZ	15 23 06
30	eXZ	07 19 37	14	ePZ	17 51 07
31	eXZ	02 59 17	17	eXZ	09 33 48
	Karachi		18	ePZ	08 47 28±
1	eXZ	12 56 56.5	20	eXZ	00 34 37
9	eXE	12 36 45	20	eXZ	11 25 34
9	eXE	14 48 03	21	eXZ	23 59 24
11	ePZ	20 15 21	23	eXZ	00 45 51±
	eSE	31	23	eXZ	10 12 13
17	ePZ	15 58 12±	24	eXZ	14 29 36
	eSE	40.2	26	eXZ	05 25 47
25	ePZ	14 41 15	26	eXZ	07 04 00
	iSE	34	28	eXZ	12 01 04
29	ePZ	19 58 14	29	eXN	03 54 13
	eSE	29	29	eXN	08 34 16
	Chittagong		30	eXZ	17 06 06
1	ePZ	04 18 49	31	eXZ	11 25 00
2	ePZ	05 11 44±	31	eXZ	21 11 14
2	eXZ	18 17 49			
2	ePZ	20 39 56			
	e(S)Z	46 44			
3	ePZ	08 00 48			
	eXZ	01 04			
	iXZ	47			
3	ePZ	14 40 44			
	eXZ	43 23			
3	eXZ	15 22 04			