Seismological. Bull. Pakistan, Quetta. Vol. 6. No.8 , August, 1960

SEISMOLOGICAL BULLETIN
OF
PAKISTAN

Vol. 6 AUGUST 1960 *No.* 8

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

Pakistan Meteorological Service

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.

SEISMOLOGICAL BULLETIN
of
PAKISTAN.
Pakistan Meteorological Service, Geophysical Institute, Quetta.

Vol. 6 — August 1960 — No. 8

CONTENTS

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	Cretaeocus 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 = ¼ ,,	—	—
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 = ¼ ,,	—	—
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.

Major Shocks

Date	Station	Phase	h	m	s
1	Qt	ePZ	02	23	27 d
		isPZN			46
		iSNEN*		25	25
		Mu Sec			
		PZ 0·6 1·2			
		△ = 10°·6			
	Kr	eSE		25	47
	Wr	ePN		24	30
	Lh	ePZ			49
		H 02 20 56			
		27·7 N 54·8 E			
		Southern Iran			
		depth about 60 km			
		USCGS H 02 20 52·4			
		27·9 N 54·2 E			
		Southern Iran			
		depth about 110 km			
		Mag 6·4 (Qt)			
1	Qt	ePZ	03	54	39
1	Qt	ePZ	12	50	29c
		USCGS H 12 40 23·6			
		40·1 N 142·0 E			
		Near north coast of			
		Honshu, Japan			
		depth about 98 km			
1	Qt	ePZ	18	44	48
1	Qt	ePZ	20	32	11
1	Qt	ePZ	21	39	42c
1	Ch	ePZ	22	04	38
	Qt	ePZ		07	06c
		USCGS H 21 56 24·2			
		27·7 N 142·5 E			
		Bonin Islands			
		depth about 28 km			

Date	Station	Phase	h	m	s
1	Qt	ePZ	23	46	27
2	Ch	ePZ	05	20	12c
		ePcPZ			15
		ePPZ		23	40
		ePPPZ		25	35
		eSKKSZ		30	39
		eSZ			54
	Wr	ePKPN		25	49
	Qt	ePKPZ			51c
		USCGS H 05 07 22·1			
		22·2 S 171·5 E			
		Loyalty Islands			
		depth about 108 km			
		Mag 6½ (Pas), 6¼ (Berk)			
2	Ch	ePZ	06	26	17
		ePcPZ			35
		ePPZ		29	00
	Qt	ePZ		27	00
		USCGS H 06 14 47·1			
		51·5 N 178·3 W			
		Andreanof Islands			
		Aleutian Islands			
		depth about 34 km			
2	Qt	ePKPZ	09	49	24
		USCGS H 09 30 26·5			
		28·2 S 176·6 W			
		Kermadec Island			
		depth about 61 km			
2	Qt	ePKPZ	10	25	18
		USCGS H 10 06 25·3			
		28·4 S 176·8 W			
		Kermadec Island			
		depth about 92 km			
2	Wr	ePKPN	14	02	21

Major Shocks

Date	Station	Phase	h	m	s
	Qt	ePKPZ			22
		USCGS H 13 42 28			
		4·5 S 104·7 W			
		Southwest of			
		Galapagos Islands			
		depth about 93 km			
2	Qt	ePZ	15	13	34
		eSNE		15	37
2	Kr	ePgZ	16	45	23
		iSNE			52
	Qt	ePnZ			35
		eP*Z			40
		ePgZ			52
		eSnE		46	26
		eS*N			38
		eSgNE			48
		H 16 44 28			
		Mekran Range			
2	Wr	ePN	21	00	32
	Lh	ePZ			52
	Qt	ePZ			54
		USCGS H 20 51 03·8			
		84·2 N 2·3 E			
		North Polar region			
		depth about 40 km			
3	Qt	ePZ	01	33	17
3	Kr	ePnZ	07	03	06 c
		ePgZ			12
		iSgZE			49
	Qt	iPnZ			10 c
		ePgZN			19
		eSnN			47
		eSgE			57
	Lh	ePnZ		04	18±
	Wr	ePnN			22
		eSnN		05	48
		H 07 02 22			
		27¼ N 67 E			
		Kalat, Baluchistan			
3	Qt	ePZ	19	27	47
3	Qt	ePZ	21	55	04
	Wr	ePN			48
3	Wr	ePN	22	58	54
		eSN		59	30
	Qt	ePZ			59 c
		e(sP)Z	23	00	39
		eSNE		01	25
		H 22 58 06			
		Afghanistan-Tadzhik			
		border			
4	Wr	ePN	07	46	23
	Lh	ePZ			27 c
		ePPZ		49	13
		eSNE		55	57
		esSN		56	36
		Mu Sec			
		PZ 1·9 1·4			
		△ = 75°·1			
	Qt	iPZ	07	46	56 c
		iPcPZN		47	06
		epPZN			20
		ePPZN		49	56
		ePPPZE		51	46
		i!SNEN*		56	55
		esSNE		57	38

Seismological Bulletin of Pakistan
Volume 6 No. 8, August 1960

Major Shocks

Date	Station	Phase	h	m	s
		ePSNN*			50
		Mu Sec			
		PZ 1·8 1·7			
		△ = 80°·4			
	Kr	ePZ	07	47	19
		USCGS H 07 34 53·8			
		51·4 N 179·1 E			
		Rat Islands			
		Aleutian Islands			
		depth about 83 km			
		Mag 6¼ (Pas),			
		6·7 (Qt, Lh)			
4	Lh	ePZ	09	20	08
	Qt	ePZ			37 c
		USCGS H 09 08 36·2			
		51·0 N 179·0 E			
		Rat Islands			
		Aleutian Islands			
		depth about 100 km			
4	Qt	ePZ	11	35	33
4	Qt	ePZ	13	22	56
4	Lh	ePZ	14	17	04 c
	Qt	ePZ			33 c
		USCGS H 14 05 28·2			
		51·3 N 178·8 E			
		Rat Islands			
		Aleutian Islands			
		depth about 59 km			
5	Qt	ePZ	16	17	29
		USCGS H 16 06 33·4			
		50·1 N 156·8 E			
		Off south coast of			
		Kamchatka			
		depth about 42 km			
5	Qt	ePZ	16	36	52d
		USCGS H 16 26 23·5			
		9·5 S 118·8 E			
		Sumba Islands			
		depth about 64 km			
5	Ch	ePZ	22	38	58
	Wr	ePN		39	09
	Lh	ePZ			16±
	Qt	ePZ			43 c
		eSNEN*		49	49
		eSSN*		54	54
		USCGS H 22 27 34·2			
		51·0 N 178·7 E			
		Rat Islands			
		Aleutian Islands			
		depth about 15 km			
6	Ch	ePZ	03	13	11
	Qt	ePZ			15 26d
		USCGS H 03 05 56·4			
		27·9 N 139·0 E			
		Bonin Islands region			
		depth about 583 km			
6	Qt	ePKPZ	15	09	28
		$ePKP_2Z$			37
	Wr	$ePKPZ_2N$			43
	Lh	$ePKP_2Z$			45
		USCGS H 14 49 44·9			
		42·4 S 47·8 W			
		Near coast of Chile			
		depth about 35 km			
6	Qt	ePZ	17	53	29
7	Qt	ePZ	03	29	03
		USCGS H 03 18 37·3			
		40·7 N 143·5 E			
		Off east coast of			
		Honshu, Japan			
		depth about 60 km			

Major Shocks

Date	Station	Phase	h	m	s
7	Wr	ePnN	04	44	31
		eSnN		45	18
	Qt	ePnZ		44	32
		iSnNN*		45	19
		H 04 43 30			
		Eastern Afghanistan			
7	Qt	ePZ	10	32	25
		eSNEN*		35	18
7	Qt	ePZ	16	37	12
7	Qt	ePZ	22	38	11
		USCGS H 22 26 08			
		50·8 N 179·0 E			
		Rat Islands			
		Aleutian Islands			
		depth about 92 km			
8	Qt	ePZ	01	30	35
		USCGS H 01 19 18·7			
		55·5 N 166·3 E			
		Komandorskie Islands			
		depth about 38 km			
8	Qt	ePZ	12	33	59
		ePPNE		34	44
		eSNEN		38	41
	Wr	ePN		34	47
		USCGS H 12 28 10·2			
		12·0 N 44·4 E			
		Gulf of Aden			
		depth about 24 km			
8	Qt	ePZ	15	46	44
		USCGS H 15 34 26·8			
		1·9 S 11·1 W			
		South Atlantic Ocean			
		depth about 60 km			
8	Qt	ePZ	20	43	03
		USCGS H 20 36 28·4			
		36·0 N 27·3 E			
		Dodecanese Islands			
		depth about 87 km			
9	Wr	ePN	06	11	16
		eSN			44
	Qt	ePZ		12	17
		eSNE		13	31
		H 06 10 40			
		Hindukush			
9	Qt	ePKPZ	06	29	28
	Wr	ePKP$_2$N			44
	Lh	ePKP$_2$Z			50
		USCGS H 06 10 11·0			
		21·2 S 71·6 W			
		Off coast of Chile			
		depth about 104 km			
9	Ch	ePZ	06	31	54
	Qt	ePZ		32	57
		eXZ		33	06
		USCGS H 06 21 40·9			
		56·1 N 164·2 E			
		Off east coast of			
		Kamchatka			
		depth about 10 km			
9	Ch	ePZ	07	08	20±
	Qt	ePZ		09	12
		eXZ			22
		USCGS H 06 58 05·5			
		56·1 N 164·2 E			
		Off east coast of			
		Kamchatka			
		depth about 37 km			
9	Qt	ePZ	14	12	39

Seismological Bulletin of Pakistan
Volume 6 No. 8, August 1960

Major Shocks

Date	Station	Phase	h	m	s
		USCGS H 14 02 39·3			
		47·5 N 142·7 E			
		Shakhalin Islands			
		depth about 35 km			
9	Qt	ePZ	17	04	25
9	Qt	ePKPZNE	17	05	19
		USCGS H 16 46 37·7			
		24·5 S 177·1 W			
		Tonga Islands region			
		depth about 186 km			
9	Qt	ePZ	18	32	12
9	Qt	ePZ	22	06	36
	Wr	ePN		07	01
9	Qt	ePZ	23	50	52
		USCGS H 23 36 51·5			
		11·5 S 166·3 E			
		Santacruz Islands			
		depth about 80 km			
10	Qt	ePZ	01	15	04
10	Qt	ePZ	10	35	21
		USCGS H 10 24 46·8			
		9·4 S 119·0 E			
		Sumba Islnads			
		depth about 31 km			
11	Ch	ePZ	02	48	26
	Qt	ePZ		49	05
		USCGS H 02 36 56·5			
		52 N 176·2 W			
		Andreanof Islands			
		Aleutian Islands			
		depth about 97 km			
11	Ch	ePZ	03	00	19
		epPZ			33
		ePPZ		01	46
		ePPPZ		02	08
		eSZ		06	01
		esSZ			28
	Wr	ePN		03	09
	Qt	ePZ			22 c
		epPZNE			32
		ePPZN		05	29
		eSNEN*		11	31
		esSNEN*			48
		USCGS H 02 53 16·3			
		0·0 121·6 E			
		Celebes			
		depth about 46 km			
11	Ch	iPZ	04	57	28 c
		iXZ			43
		epPZ			52
		esPZ		58	03
		ePPZ			56
		ePPPZ		59	18
		eSZ	05	03	01
		esSZ			43
	Lh	ePZ	04	59	45 c
		ePcPZ	05	00	54
		eSN		07	09
	Wr	ePN		00	07
		eSN		07	52
	Qt	iPZ		00	29c
		iXZ			42
		epPZNE			51
		ePPZ		02	38
		eSNEN*		08	33
		esSN*		09	17

Date	Station	Phase	h	m	s
		Mu Sec			
		PZ 0·5 1·5			
		△ = 59°·5			
		USCGS H 04 50 33·9			
		8·8 N 126·1 E			
		Mindanao			
		Philippine Islands			
		depth about 79 km			
		Mag 6·3 (Qt)			
12	Qt	ePZ	10	12	26
12	Lh	ePZ	13	21	59 c
		eXZ		22	08
	Wr	ePN			09
	Qt	ePZ			44 c
		iXZ			55
		epPNE	23	07	
		ePcPZN			26
		ePPZN	25	03	
		Mu Sec			
		PZ 0·4 1·5			
		△ = 61°·7			
		USCGS H 13 12 34·3			
		36·1 N 141·4 E			
		Near east coast of			
		Honshu, Japan			
		depth about 95 km			
		Mag 6·3 (Qt)			
12	Wr	iPN	21	05	10
		iSN			45
	Lh	ePZ			51 d
		eSNE	06	55	
	Qt	ePZ			04 d

Date	Station	Phase	h	m	s
		esPZ			54
		eSNE	07	19	
		H 21 04 28			
		36 N 70 E			
		Hindukush			
		depth about 200 km			
12	Lh	ePZ	23	32	56
	Qt	ePZ		33	29 c
13	Qt	ePZ	04	27	24
13	Lh	ePZ	07	20	31
		ePcPZ		21	33
		eSN		28	07
	Wr	iPN		20	37
	Qt	iPZNE		21	14 c
		eSNN*		29	26
	Kr	iPZ		21	32 c
		USCGS H 07 11 05·5			
		40·6 N 142·0 E			
		Near east coast of			
		Honshu, Japan			
		depth about 60 km			
13	Kr	ePKPZ	14	34	30
	Qt	ePKPZ			37 d
		iXZ			43
		ePKSZNE	38	10	
		ePPNE			25
	Wr	ePKP$_2$N	34	52	
	Lh	ePKPZ			45 d
		USCGS H 14 14 57·7			
		39·7 S 74·8 W			
		Near east coast of			
		Southern Chile			
		depth about 61 km			

Date	Station	Phase	h	m	s
13	Qt	ePZ	14	48	36
13	Qt	ePZ	22	34	18
14	Qt	ePZ	04	11	31 c
		USCGS H 04 00 52·3			
		45·4 N 151·1 E			
		Kurile Islands			
		depth about 54 km			
14	Lh	P	14	52	48
	Qt	eP		53	18 c
		USCGS H 14 41 04·2			
		7·2 S 146·2 E			
		Near north coast of			
		New Guinea			
		depth about 200 km			
14	Lh	P	21	35	46
	Qt	eP		36	18
		USCGS H 21 23 40·4			
		52·5 N 167·2 W			
		Fox Islands			
		Aleutian Islands			
		depth about 22 km			
14	Wr	iPN	22	37	51
	Lh	ePZ		38	36
		esPZ			57
		eSZ		39	38
	Qt	ePZ		38	41 c
		esPZ			57
		eSNEN*		39	52
		H 22 37 09			
		36 N 69¼ E			
		Hindukush			
		depth about 60 km			
		USCGS H 22 37 11·9			
		36·0 N 69·3 N			
		Hindukush			
		depth about 69 km			
14	Wr	ePN	23	01	03
	Qt	ePZ			53

Date	Station	Phase	h	m	s
15	Qt	ePZ	07	07	03
		ePPZEN*		08	44
		iSN*		13	34
		eLN*			17·0
	Lh	ePZ		07	17
		USCGS H 06 58 56·4			
		13·4 S 65·8 E			
		Indian Ocean			
		depth about 15 km			
15	Qt	ePN	14	41	45 d
		ePPZNN*		43	24
		iSN*		48	15
		eLN*			51·6
	Lh	ePZ			41 59
		USCGS H 14 33 38			
		135· S 67·0 E			
		Indian Ocean			
		depth about 25 km			
16	Qt	ePZ	10	04	06
16	Qt	ePZ	10	37	42
		ePPZE		38	57
		USCGS H 10 31 03·1			
		3·6 S 68·7 E			
		Chagos Archipelago region			
		depth about 60 km			
16	Qt	ePZ	22	39	04
		USCGS H 22 27 52·7			
		7·6 S 128·8 E			
		Timor Islands region			
		depth about 60 km			
17	Qt	ePZ	09	46	43

Major Shocks

Date	Station	Phase	h	m	s
		USCGS H 09 33 49·1			
		20·1 S 11·4 W			
		South Atlantic Ocean			
		depth about 87 km			
17	Qt	ePZ	11	37	12
		eSN*		48	00
		USCGS H 11 24 07·2			
		19·8 S 12·2 W			
		South Atlantic Ocean			
		depth about 25 km			
17	Qt	ePZ	15	04	26
		eSNE		05	45
17	Qt	ePZ	18	20	20
		USCGS H 18 08 35·6			
		1·7 S 138·6 E			
		Near north coast of			
		New Guinea			
		depth about 45 km			
18	Wr	ePN	02	20	55
		eSN		21	27
	Qt	ePZ			53d
		eSNE		23	11
		H 02 20 11			
		Hindukush region			
18	Qt	ePnZ	06	23	20d
		iPgZ			25
		iSnNEN*			49
	Wr	ePnN			47
		H 06 22 41			
		Eastern Afghanistan			
18	Qt	ePZ	11	27	05
18	Ch	ePZ	20	55	56
		epPZ		56	05
		ePcPZ		57	18
		ePPZ			52
	Lh	ePZ		56	51
	Qt	ePZ		57	32
		USCGS H 20 47 02·5			
		44·5 N 147·6 E			
		Kurile Islands			
		depth about 32 km			
18	Qt	ePZ	21	47	55
19	Ch	ePZ	03	10	00
	Qt	ePZ		14	07
		ePPZ			51
		ePPPZ		15	03
		eSNE		18	34
		iSSN*		19	40
		USCGS H 03 08 29·3			
		25·9 N 96·4 E			
		Northern Burma			
		depth about 27 km			
19	Wr	ePN	08	19	49
	Qt	ePZ		20	12
19	Qt	ePZ	08	34	11
		eSN		35	42
19	Ch	ePZ	12	49	17
		eSN*		55	31
	Lh	ePZ		50	54
	Wr	iPN		51	04
	Qt	ePZ			35
		epPZE		52	38
		ePPZ		53	51
		eSNEN*		59	34

Seismological Bulletin of Pakistan
Volume 6 No. 8, August 1960

Major Shocks

Date	Station	Phase	h	m	s
		Mu Sec			
		PZ 0·8 1·0			
		△ = 62°·7			
		USCGS H 12 41 31·4			
		27·0 N 140·1 E			
		Bonin Islands region			
		depth adout 28·3 km			
		Mag 6·3 (Qt)			
19	Qt	ePZ	17	14	40
		USCGS H 17 03 39·0			
		54·1 N 160·6 E			
		Near east coast of			
		Kamchatka			
		depth about 25 km			
20	Qt	ePKPZ	00	38	38
		e(PKS)Z		41	57
		USCGS H 00 19 34·4			
		14·3 N 91·4 W			
		Guatemala			
		depth about 158 km			
		Mag 6 (Pas)			
20	Qt	ePZ	00	45	41
20	Wr	ePN	01	01	48
		eSN		02	21
	Qt	ePZ			46
		eSZN		04	06
		H 01 01 01			
		Afghanistan			
20	Qt	ePZ	20	22	33±
		ePPZ		26	42
		eSN*		34	02
		USCGS H 20 08 39·0			
		35·6 S 15·4 W			
		Taristan da Cunha			
		region			
		depth about 37 km			
20	Wr	ePN	20	56	34
		eSN		57	03
	Qt	ePZ			38
		eSZN		58	56
		H 20 55 56			
		Hindukush			
20	Ch	iPZ	22	29	50d
		epPZ		30	10
		esPZ			21
		ePPZ		31	17
		eSZN*		35	26
		esSN*			58
	Lh	ePZ		32	09d
		eSNE		39	42
		Mu Sec			
		PZ 0·8 1·2			
		△ = 54°·6			
	Wr	ePN	22	32	33
		eSN		40	27
	Qt	iPZ		32	47d
		epPZNE		33	05
		ePPZE		35	02
		iSNEN*		40	54
		isSNN*		41	22
		Mu Sec			
		PZ 0·5 1·5			
		△ = 60°			
		USGGS H 22 22 44·6			
		0·5 N 122·0 E			
		Northern Celebes			
		depth about 59 km			
		Mag 6½ (Lh), 6·4 (Qt)			
21	Ch	ePZ	00	27	51
	Lh	ePZ		29	41d

Major Shocks

Date	Station	Phase	h	m	s
	Wr	iPN			58
	Qt	iPZ		30	15 d
		ePPZ		33	22
		Mu Sec			
		PZ 0·4 0·8			
		△ = 81°			
		USCGS H 00 18 01·5			
		4·3 S 143·3 E			
		New Guinea			
		depth about 39 km			
		Mag 6·5 (Qt)			
21	Lh	ePZ	01	11	21
	Wr	ePN			35
	Qt	ePZ			52
		USCGS H 00 59 25·2			
		5·5 S 149·5 E			
		New Britain			
		depth about 177 km			
21	Ch	iPZ	03	30	28c
		ePPZ			37
		esPZ			53
		iXZ		31	07
		eSZ			26
		eSSZ			45
	Wr	ePN		33	16
	Qt	ePZ			33
		e(S) NN*		36	57
		USCGS H 03 29 11·8			
		26·4 N 88·6 E			
		Nepal-India border			
		depth about 81 km			
21	Ch	ePN*	12	56	26
		ePPN		58	02
		ePPPN*			25
		eSN*	13	02	01
		esSN*		03	25
	Lh	ePZ	12	58	47(
		eSNE	13	06	09
	Wr	ePN	12	59	10
		eSN	13	06	52
	Kr	iPZ	12	59	21
		epPZ	13	00	07
		Mu Sec			
		PZ 0·9 1·3			
		△ = 59°·1			
	Qt	ePZ	12	59	28d
		ipPZ	13	00	13
		esPZ			35
		eSNEN*		07	26
		isSN*		08	44
		ePKPPKPZ		28	53
		Mu Sec			
		PZ 0·3 10			
		△ = 60°			
		USCGS H 12 49 37·6			
		4·9 N 125·1 E			
		Near south coast of Mindanao, Philippine Islands			
		depth about 211 km			
		Mag 6·0 (Qt), 6·3 (Kr)			
21	Ch	ePZ	17	12	04
	Qt	ePZ		15	15

Major Shocks

Date	Station	Phase	h	m	s
		USCGS H 17 05 23·5			
		7·2 N 127·8 E			
		Off coast of Mindanao, Philippine Islands			
21	Qt	ePZ	18	15	30
		USCGS H 18 05 01·5			
		44·6 N 148·7 E			
		Kurile Islands			
		depth about 184 km			
21	Qt	iPZ	23	14	52·3c
		iSNEN*		15	11·5
		H 23 14 25·5			
		Baluchistan-Afghanistan border			
22	Qt	ePZ	21	06	04
23	Qt	ePZ	04	33	30
		eSN*		37	26
23	Qt	ePZ	08	59	42c
		iPPNEN*			56
		i(S) NN*	09	01	07
	Kr	ePZ		00	00
	Wr	ePZ			50
		USCGS H 08 58 12·1			
		29·0 N 59·9 E			
		Southeastern Iran			
		depth about 116 km			
23	Wr	ePN	09	29	43
	Qt	ePZ		30	35
		eSNE		32	00
		H 09 28 44			
		Afghanistan— Tadzhikistan border			
23	Qt	ePZ	14	21	28
23	Qt	ePKPZ	23	03	42
		ePPZ		05	07
		USCGS H 14 08 14·9			
		0·9 N 26·0 W			
		Atlantic Ocean			
		depth about 25 km			
		USCGS H 22 44 51·5			
		14·5 S 176·4 W			
		Fiji Islands region			
		depth about 56 km			
		Mag 6 (Pas)			
24	Wr	ePN	10	54	44
		eSN	02	03	12
	Qt	ePZ	01	55	15
		ePPZ		57	47
		iSEN*	02	04	17
		ePSN*			38
		eScSN*		05	14
		USCGS H 01 44 09·9			
		56·3 N 163·8 E			
		Near east coast of Kamchatka			
		depth about 25 km			
24	Qt	ePKPZ	06	08	02
		USCGS H 05 49 01·1			
		19·0 S 174·1 W			
		Tonga Islands			
		depth about 42 km			
24	Qt	ePZ	16	24	07
24	Qt	ePnZ	18	23	51 d
		iSnNE		24	18
	Wr	ePnN			43
		H 18 23 14			
		Eastern Baluchistan			

Date	Station	Phase	h	m	s
24	Ch	ePZ	19	28	45
		eSZ		29	25
	Lh	ePZ		32	13
	Wr	ePN			49
		eSN		36	43
	Qt	ePZ		33	12
		epPZE			41
		ePPZ			57
		eSNEN*		37	25
		esSNEN*		38	23
		H 19 27 57			
		24 N 94½ E			
		India-Burma border			
		depth about 150 km			
		USCGS H 19 27 53·2			
		24·4 N 95·0 E			
		Burma-India border			
		depth about 145 km			
24	Lh	ePZ	20	32	48
	Qt	ePZ		33	31
24	Qt	ePZ	22	38	10
25	Qt	ePZ	01	18	56
25	Qt	ePZ	06	28	44
	Wr	ePN			58
25	Qt	ePZ	08	59	22
25	Qt	ePZ	09	14	52
25	Ch	ePZ	17	53	45
		ePcPZ		54	01
		ePPZ		57	01
		ePPPZ		58	51
		eSZ	18	04	02
	Wr	ePN	17	54	00
	Qt	ePZ			28 c
		iXZE			41
		ePPZ		57	52
		eSKSNEN*	18	04	52
		iSN*		05	09
		eSSN*		10	52
		Mu Sec			
		PZ 0·5 1·5			
		△ = 87°·6			
		H 17 41 37 (Quetta)			
		USCGS H 17 41 58·8			
		52·7 N 169·6 W			
		Fox Islands			
		Aleutian Islands			
		depth about 38 km			
		Mag 6·6 (Qt)			
25	Qt	ePKPZ	23	22	01
		ePPZ		25	36
	Wr	ePKP$_2$NN		22	23
		USCGS H 23 02 26·5			
		37·8 S 73·5 W			
		Near coast of Chile			
		depth about 109 km			
26	Qt	ePKPZ	00	33	50
		ePKP$_2$Z		34	00
		ePKSZNE		37	28
	Wr	ePKP$_2$N		34	01
		USCGS H 00 14 04·9			
		37·8 S 73·2 W			
		Near coast of Chile			
		depth about 25 km			
26	Qt	ePZ	01	43	2
26	Qt	iPZE	07	10	0
		i!SZNEN*			3
	Kr	ePZ			3

Date	Station	Phase	h	m	s
		isPZE			57
		iSE		11	21
	Wr	ePN			18
	Lh	ePZ			19
		eSZ		12	35
		H 07 09 41			
		28½ N 67¼ E			
		Kalat, Baluchistan			
		West Pakistan			
		depth about 60 km			
		USCGS H 07 09 40·3			
		28·1 N 66·7 E			
		West Pakistan			
		depth about 68 km			
26	Lh	ePnZ	09	46	37
		ePgZ			49
		iSnN		47	23
		iSgN			40
	Qt	ePnZ		46	55 c
		ePgZNE		47	17
		eSnZEN*			53
		H 09 45 36			
		Afghanistan-Pakistan			
		border			
26	Qt	ePZ	11	58	28d
		USCGS H 11 47 29·6			
		11·1 S 123·7 E			
		Timor Islands region			
		depth about 79 km			
26	Qt	P	17	14	55
26	Ch	ePZ	18	39	43
	Qt	ePPZE		45	37
		eSKKSN*		52	47
		USCGS H 18 27 18·2			
		13·5 S 165·9 E			
		New Hebrides Islands			
		depth about 56 km			
27	Qt	ePZ	10	24	06
		ePPZE		25	22
	Wr	ePN		24	32
		USCGS H 10 17 18·1			
		34·4 N 26·3 E			
		Crete			
		depth about 40 km			
27	Ch	ePnZ	12	32	17
		eP*Z			26
		ePgZ			39
		eSnZ		33	14
		eS*Z			27
		eSgZ			40
	Wr	ePN		35	08
	Qt	ePZ			39
		H 12 31 02			
		27 N 90 E			
		Bhutan-India border			
27	Lh	ePZ	15	59	54
		eSN	16	00	34
	Wr	ePN			43
	Qt	ePZ		01	05 c
		esPZ			24
		eXZE			45
		eSZNN*		02	40
	Kr	ePZ		01	12±

Major Shocks

Date	Station	Phase	h	m	s
		H 15 59 00			
		28·7 N 76·9 E			
		Northern India			
		depth about 60 km			
		Felt and slight damage at			
		New Delhi			
		USCGS H 15 58 59·2			
		28·2 N 77·4 E			
		India			
		depth about 109 km			
27	Ch	ePZ	18	25	33d
		epPZ		26	26
		ePcPZ			30
		esPZ			54
		ePPZ		27	46
		ePPPZ		29	05
		eSZ		33	04
	Lh	ePZ		26	04d
	Wr	ePN			05
	Qt	ePZ			40d
		ePcPZ		27	12
		epPZ			32
		e(PP)ZNE		28	59
		USCGS H 18 16 15·7			
		49·9 N 153·7 E			
		Kurile Islands			
		depth about 220 km			
27	Qt	ePZ	19	37	40
27	Wr	ePN	22	19	30
		eSN		20	14
	Lh	ePZ			22
		eSN		21	48
	Qt	ePZ		20	23
		eSNE		21	47
		H 22 18 33			
		37 N 69 E			
		Afghanistan-Tadzhikistan			
		border			
28	Qt	ePnZ	16	18	36
		ePgZ			41
		iSnZNE		19	03
		iSgNE			09
	Wr	ePN			27
29	Wr	ePN	03	54	17
	Qt	ePZ		55	12
		eSNE		56	40
		H 03 53 17			
		Afghanistan-Tadzhikistan			
		border			
29	Wr	ePN	16	23	50
		eSN		24	17
	Lh	ePZ			32
		iSN		25	28
	Qt	ePZ		24	54d
		esPZ		25	24
		iSNE		26	11
		H 16 23 14			
		36 N 71 E			
		Hindukush			
		depth about 150 km			
29	Qt	ePZ	18	07	44
		USCGS H 18 00 35·2			
		35·4 N 27·1 E			
		Crete			
		depth about 14 km			
30	Qt	ePKPZ	07	05	25
		ePPZ		10	37
		USCGS H 06 45 16·4			
		20·9 S 113·7 W			
		South Pacific Ocean			
		about 500 miles northeast			
		of Easter Islands			
		depth about 40 km			
30	Ch	ePZ	10	20	40
	Wr	ePN		22	43
	Qt	ePZ			54
		USCGS H 10 11 26·2			
		3·5 S 134·2 E			
		New Guinea			
		depth about 31 km			
30	Qt	ePZ	22	39	03
31	Qt	ePKPZ	07	36	23±
		ePPZ		41	38
		USCGS H 07 16 10·4			
		20·9 S 114·1 W			
		South Pacific Ocean			
		depth about 25 km			
31	Wr	ePN	11	45	54
	Qt	ePZ		47	00
31	Lh	ePZ	17	30	14d
	Wr	ePN		30	35
	Qt	ePZ		31	03d
		eSN*		38	19
		USCGS H 17 21 55·1			
		13·7 N 120·1 E			
		Near coast of Luzon			
		Philippine Islands			
		depth about 22 km			
31	Qt	ePZ	22	17	37
	Wr	ePN			55
		USCGS H 22 11 53·9			
		39·1 N 36·3 E			
		Turkey			
		depth about 44 km			

Seismological Bulletin of Pakistan
Volume 6 No. 8, August 1960

Major Shocks

Minor Shocks

Date	Phase	h	m	s
	Quetta			
1	ePZ	06	34	24
	eSN			46
1	ePZ	10	06	01
	eSN			52
1	eXZ	13	07	38
1	ePZ	13	41	44
1	ePZ	17	02	33
	iSNE			52
1	ePZ	17	17	22
	eSN			41
1	eXZ	19	52	40
1	elZ	20	40	17
1	elZ	22	40	14
2	ePZ	04	30	45
	eSNE		31	09
2	elZ	12	37	49
	eSNE		38	14
2	ePZ	13	10	27
	eSE			49
2	ePZ	16	09	12
	eSNE			41
2	ePgZ	18	32	21·8
	iSgNE			24·1
2	eXZ	22	36	00
3	ePZ	05	35	02
	eSZE			26
3	ePZ	06	31	52
	eSNE			32 17
3	eXZ	08	16·0	
3	ePZ	10	32	48
	eSNE		33	09
3	ePZ	14	06	24
	eSNE			48
3	eXE	14	07·5	
3	ePZ	18	54	00
3	ePZ	22	19	44
4	eXZ	06	15	44
4	ePZ	15	01	43
	eSN		02	06
4	ePgZ	16	01	31
	eSgN			43
4	iPgZ	20	04	57
	iSgN		05	13
5	eXZ	03	01	49
5	elZ	10	24	04
	eSN			29
5	ePZ	12	04	10
	eSNE			33
6	ePZ	01	14	25
	eSNE		15	37
6	ePZ	08	24	24
	eSN			49
6	ePgZ	10	43	01
	iSgNE			11
6	ePZ	16	26	04d
	iSN			28
6	eXZ	18	23·0	
7	ePZ	02	01	24
7	ePZ	03	07	18
7	ePZ	10	15	32
8	elZ	02	41	33
	eSNE			59
9	elZ	00	43	18
9	eXZ	02	05·0	
9	ePZ	05	15	36
9	ePZ	09	18	01
	eSN			27

Minor Shocks

Date	Phase	h	m	s
9	eXZ	17	21	52
9	ePgZ	19	40	15·0
	eSgN			16·5
11	elZ	09	52	05
	eSNE			28
12	ePZ	10	12	26
12	ePZ	10	30	38
	eSNE		31	05
12	ePZ	16	16	25
	eSNE			50
12	elZ	18	07	27
	eSNE			52
12	ePZ	18	11	57
	eSNE		12	22
13	ePZ	00	45	54
	eSNE		47	07
13	ePZ	07	30	49
13	ePgZ	07	51	36
	eSgN			44
13	eXN	09	01·0	
13	ePZ	17	55	57
14	ePZ	09	23	48
	eSNE		24	07
14	elZ	09	49	58
	eSNE		50	24
14	ePgZ	12	56	33
	eSgZN			42
14	eXZ	12	59	41
14	ePgZ	18	21	51·5
	eSgZN			53·2
14	ePZ	19	50	14
	eSNE		51	32
14	ePS	21	00	22
	eSNE			46
14	eXZ	23	08	00
15	ePZ	00	34	33
	eSNE			58
15	eXZ	05	46	30
15	eXZ	06	51	32
15	ePgZ	10	01	35
	iSgZNE			51
15	ePgZ	13	26	40
	eSgNE			56
15	eXZ	14	04·2	
16	ePZ	07	12	42
	eSNE		13	06
16	eXZ	10	04	01
16	eXZ	10	30	00
16	ePgZ	13	56	43
	iSgNE			35
16	ePZ	22	35	20
16	ePZ	23	35	20
16	ePZ	23	14	00
17	ePgZ	16	15	22
	iSgNE			34
17	eXZ	20	28	31
17	eXZ	22	22·5	
18	ePZ	07	07	24
	eSN			50
18	ePZ	10	15	05
	eSZN			34
18	eXZ	10	43	44
18	ePZ	21	06	10
18	ePZ	21	19	34
	eSNE			20 00
18	ePZ	23	57	00
	eSN			18

Minor Shocks

Date	Phase	h	m	s
19	ePZ	03	01	38
	eSN		02	11
19	ePZ	19	10	52
	eSN		11	19
19	ePZ	21	57	55
	eSN		58	19
20	ePZ	01	29	23
	eSN		30	54
20	ePZ	15	38	00
	eSN			26
21	ePZ	06	40	59
	eSNE		41	19
21	eXZ	17	57	39
22	ePZ	03	29	12
	eSN			36
22	eXZ	10	30	10
22	ePZ	12	25	12
	e(S)N		26	13
22	ePgZ	19	29	52
	eSgN		30	06
22	ePZ	23	06	09
	iSZN			35
23	ePZ	09	17	36
	eSNE		18	02
23	ePZ	11	15	48
	eSE		16	12
23	eXZ	12	23	27
23	ePZ	18	22	37
	eSN		23	37
23	ePZ	19	07	39
	eSNE		08	16
23	ePZ	20	36	58
	eSN		37	24
24	ePZ	00	08	04
	eSNE			31
24	ePZ	00	27	24
	eSNE			44
24	ePZ	07	33	10
	eSNE		34	33
24	ePZ	10	35	39
	eSNE		36	01
24	ePZ	10	36	32
	eSNE			58
24	ePZ	13	19	36
24	ePZ	17	01	44
	eSNE		02	09
24	eXZ	17	38	0
24	ePZ	18	20	15
	eSNE			41
24	ePZ	18	59	32
	eSN			57
24	ePZ	21	10	54
	eSN		11	19
24	ePZ	22	09	47
25	ePZ	04	19	48
	eSNE		20	15
25	eXN	05	29	41
25	ePZ	05	48	04
	eSE			30
25	ePZ	15	38	37
	eSNE		39	03
25	ePZ	17	52	37
	eSNE		53	05
25	eXZ	18	05	24
25	ePZ	21	02	48

Minor Shocks

ate	Phase	h	m	s
	eSNE		03	14
	eRE	21	08	5
6	eXZ	04	30	0
6	eXZ	04	56	7
6	ePZ	08	34	38
	eSN			58
6	eXZ	09	58	0
6	ePZ	10	14	17
6	ePZ	11	43	44
6	ePZ	14	49	33
	eSNE			59
6	eXE	15	11	01
6	ePZ	15	18	34
	iSNE		19	00
7	ePZ	01	44	30
	iSNE			52
7	ePZ	06	49	00c
	eSNE			27
	eXZ	10	11	22
7	iPgZ	10	47	42·1
	iSgN			43·8
	ePZ	17	14	48
	eSNE		15	14
	ePZ	22	30	40
	eSNE		31	04
	ePZ	05	06	23
	eSNE			49
	ePZ	06	09	46
	eSN		10	08
	ePZ	08	16	41
	eSN		17	08
28	ePZ	09	31	07
	eSN			31
28	ePZ	12	41	41
	eSZN		42	06
28	ePZN	15	14	30
	eSN		15	00
28	ePZ	17	30	40
	eSNE		14	06
28	ePZ	19	17	34
	eSNE			59
28	ePZ	20	49	40
	eSN		50	04
28	ePZ	23	24	53
	eSNE		25	19
28	ePZ	23	31	56
	eSN		32	24
28	ePZ	23	34	19c
	iSNE			45
29	ePZ	01	59	34
	eSN	02	00	08
29	ePZ	06	22	58
	eSNE		23	24
29	ePZ	06	54	15
29	ePZ	19	07	34
29	ePZ	19	16	55
	eSNE		18	13
29	eXZ	21	51	5
30	ePZ	05	07	42c
	eSNE		08	06

Minor Shocks

Date	Phase	h	m	s
30	ePZ	05	52	11
	eSNE			36
30	ePZ	07	54	27
30	iPgZ	11	18	48 d
	iSgNE			50·5
30	ePZ	11	21	03
	eSE			32
30	ePZ	13	45	58
	eSN		46	24
30	ePZ	15	36	21
	eSNE			47
30	ePZ	16	12	47
	eSNE		13	14
30	ePZ	16	27	00
	eSNE			26
30	ePZ	18	33	33
	eSE			59
30	ePZ	20	39	30
	eSNE			57
31	ePZ	03	34	11
	eSNE			37
31	ePZ	10	35	05
	eSNE			43
	Warsak			
1	ePN	13	07	06
1	ePN	13	23	54
2	ePN	01	07	10
3	ePN	07	51	25
3	ePN	14	05	16
	iSN			43
5	ePN	15	05	47
	eSN		06	08
6	ePN	01	13	31
	iSN			55
8	ePN	07	47	54
9	ePN	02	04	25
	eSN			49
10	ePN	21	37	18
	eSN			52
12	ePN	15	55	38
	eSN		56	01
12	iPN	21	05	10
	iSN			45
14	iPN	19	49	25
	eSN			57
15	ePN	01	20	01
	eSN			34
17	ePN	15	03	45
	eSN			58
18	ePN	10	19	59
	eSN		20	33
19	ePN	11	23	33
	eSN		24	02
20	ePN	09	28	26
	eSN		29	15
20	ePN	15	24	25
	eSN			58
21	ePN	17	58	37
	eSN		59	21
21	ePN	20	10	53
	eSN		11	36
21	ePN	23	16	40
22	ePN	07	21	24
	eSN			52
22	ePgN	12	24	00
	eSgN			13
23	ePN	14	49	50
24	ePN	16	26	23
24	ePN	17	54	49
25	ePN	18	04	13
26	ePgN	04	28	20
	eSgN			31
26	eXN	09	45	05
27	ePN	22	19	30
	eSN		20	14
28	ePN	23	35	39
29	ePN	01	59	31
29	ePN	16	23	50
	eSN		24	17
30	ePN	05	08	33
30	ePN	19	20	41
	Lahore			
3	eXZ	01	03	34
9	eXZ	06	12	58
9	eXZ	18	13	47
10	eXZ	21	38	51
10	eXZ	22	08	01
14	eXZ	23	01	55
16	eXZ	19	45	23
17	ePgZ	18	17	52
	eSgZ		18	00
18	eXNE	02	22	36
18	eXZ	06	25	03
19	eXZ	08	19	25
20	eXZ	01	03	32
20	eXZ	20	58	13
21	eXZ	03	32	18
22	ePZ	12	25	02
	eSZ		26	02
24	ePZ	17	54	56
26	ePZ	15	41	45
29	eXZ	03	55	46
31	ePgZ	19	55	06
	eSgN			12
	Karachi			
14	eXE	22	41	54
21	eXE	03	39	43
21	eXZ	23	15	54
24	eXE	19	39	36
27	eXE	12	42	14
28	eXZ	10	18	10
	eSE			16
	Chittagong			
1	ePZ	09	59	32
1	eXZ	16	40	48
2	eXZ	21	06	31
4	eXZ	14	17	29
5	eXZ	16	16	42
5	eXZ	16	35	14
7	eXZ	03	28	49

Seismological Bulletin of Pakistan
Volume 6 No. 8, August 1960

Minor Shocks

Minor Shocks

Date	Phase	h	m	s
8	e(P)Z	01	30	03
8	eXZ	12	38	17
10	eXZ	10	35	00
17	ePZ	18	18	20
19	eXZ	17	14	08
21	ePZ	01	10	16
21	eXZ	23	19	56
23	eXZ	09	05	47
27	eXZ	16	05	54
29	ePZ	04	02	01
30	ePZ	06	49	08
30	eXZ	07	08	46
31	eXZ	17	34	56