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Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11' N	66° 57' E	1721 meters	Cretaceous Limestone
Lahore	Lh	31° 33' N	74° 20' E	210 "	Alluvium
Karachi	Kr	24° 50' N	67° 02' E	30 "	Alluvium
Chittagong	Ch	22° 21' N	91° 49' E	35 "	Alluvium
Warsak	Wr	34° 09' N	71° 25' 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	19.5 "	"	16,000

(Contd.)

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
	USCGS H	09 55 16.5						Kurile Islands				
	7.2 S	128.2 E						depth about 60 km				
	Banda Sea					18	Qt	ePZ	23	34	21	
	depth about 30 km					19	Wr	ePKPZ	15	17	18	
15	Lh	ePZ	17	04	46±		Lh	ePPN	19	19		
	Wr	ePZ			57		Qt	ePKPZ	17	23		
	USCGS H	16 54 01.9						eSKPN	20	45		
	7.4 S	128.0 E						ePKPZE	17	25		
	Banda Sea							ePPZ	19	31		
	depth about 34 km							eSKPZ	20	47		
15	Wr	ePZ	21	41	54			ePKPZ	17	42		
	USCGS H	21 31 00.4						ePPZ	20	30		
	7.2 S	128.1 E						eSKPZE	21	18		
	Banda Sea							ePPPZE	23	38		
	depth about 38 km							USCGS H	14 58 13.3			
16	Wr	iPZ	14	46	23 c			17.2 N	99.5 W			
	USCGS H	14 35 29.6						Coast of Mexico				
	7.3 S	128.1 E						depth about 20 km				
	Banda Sea							Mag 7-7½ (Pas)				
	depth about 34 km					19	Wr	iPZ	20	51	35 o	
16	Qt	ePE	19	19	27			iSN	52	49		
	USCGS H	19 09 04.2						Lh	ePZ	01		
	9.3 S	118.4 E						Qt	eSN	53	36	
	Soembawa								ePNE	52	43	
	depth about 47 km								e(S)NE	54	52	
17	Wr	ePZ	12	08	14			Ch	ePZ	55	11	
	USCGS H	12 00 29.6							eSP	56		
	6.2 S	68.3 E							USCGS H	20 50 09.0		
	Chagos Archipelago region								39.5 N	73.9 E		
	depth about 25 km								Sinkiang, China			
	depth about 25 km								depth about 45 km			
18	Lh	ePZ	18	58	28				ePZ	21	29	57
	Wr	ePZ			33	19	Ch	iSZNE	30	40		
	Qt	ePZ			57 22				ePZ	33	08	
	USCGS H	18 46 40.1							Wr	ePZ	33	08
	46.1N	148.5 E							Qt	ePE	41	



Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		H 21 29 00						Chinghai province, China			
		26½ N 91½ E						depth about 25 km			
		East Pakistan Assam border				21	Ch	ePZ	13	19	09
		depth about 40 km						ePPPZ			27
20	Qt	ePKPE	00	15	58			eSE			21 53
	Wr	iPKPZ			16 03 d			ePZ			19 56
	Lh	ePKPZ			07			eSN			23 23
		USCGS H	23 56 32.4					iPZ			20 13 c
		13.4 S	76.7 W					ePNE			21 06
		Near coast of Peru						eS			25 39
		depth about 70 km						USCGS H	13 15 39.4		
20	Lh	iPZ	16	59	00			37.0 N	95.7 E		
	Wr	iPZ			23 c			Chinghai province, China			
	Qt	ePZNE			43			depth about 25 km			
		USCGS H	16 49 47			21	Wr	iPZ	15	46	18 c
		6.2 N	125.8 E					ePNE			47 09
		Near coast of Mindanao						USCGS H	15 41 46.8		
		depth about 133 km						37.1 N	95.9 E		
21	Ch	ePZ	12	06	20			Chinghai province China			
		ePPZN			31			depth about 36 km			
		eSN			09 05	21	Qt	ePE	18	20	56
	Lh	ePZ			07 07			USCGS H	18 15 29.9		
		eSN			10 35			36.9 N	96.4 E		
	Wr	iPZ			07 24 c			Chinghai province, China			
	Qt	ePZN			08 16			depth about 35 km			
		eSNE			12 44	21	Wr	ePZ	19	33	40
		USCGS H	12 02 50.6					ePE			34 32
		37.3 N	96.0 E					USCGS H	19 29 10.0		
		Chinghai province, China						37.4 N	95.5 E		
		depth about 25 km						Chinghai province, China			
		Mag 7-7½ (Pas), 6-6½ (Pal)						depth about 25 km			
21	Wr	iPZ	12	40	53	21	Wr	ePZ	19	50	33
	Qt	ePNE			41 45			ePE			51 25
		USCGS H	12 36 19.7					USCGS H	19 46 01.2		
		37.0 N	95.9 E					36.7 N	95.8 E		

Major Shocks

Date	Station	Phase	h m s	Date	Station	Phase	h m s
21	Qt	ePE	20 16 46	22	Qt	ePKP	05 00 07 ±
	USCGS H		20 11 22.8		Wr	ePKP	10
			37.1 N 95.7 E		USCGS H		04 40 14.4
			Chinghai province, China				55.5 S 138.3 W
			depth about 25 km				South Pacific Ocean
21	Qt	ePE	21 13 44	22	Wr	ePZ	06 30 26
	USCGS H		21 08 20.0			eSZ	58
			37.1 N 95.7 E		Qt	ePE	31 26
			Chinghai province, China			eSE	32 45
			depth about 25 km				H 06 29 43
21	Wr	iPZ	21 25 36 d				Hindukush region
	Qt	ePE	26 29	22	Ch	iPZ	08 18 41 c
21	Ch	ePZ	21 28 26			iPcPZ	48
		ePPZN	30 08			iPPZE	19 10
		ePPZE	32 22			esPZ	36
		iPPPZ	33 58			ePPZE	21 44
		ePPPZ	34 41			ePPPNE	23 46
		eSKSNE	38 35			eSNE	28 42
		eSNE	39 14			eScSZ	51
		isSNE	41 55			esSE	29 36
		Mu Sec				Mu Sec	
		PPZ 4.3 2.8				PZ 2.0 1.6	
		$\Delta = 97.^\circ 6$				$\Delta = 81^\circ.0$	
	Wr	ePKPZ	33 34		Lh	ePN	30 04
	Qt	ePKPE	42		Wr	iPZ	13 c
		ePPKPNE	35 17		Qt	ePZE	26
	USCGS H		21 15 31.0		USCGS H		08 06 38.7
			20.0 S 177.5 W				12.3 S 166.6 E
			Fiji Islands region				Santa Cruz Islands
			Mag $6\frac{3}{4}$ 7 (Pas), 7.0 (Ch)				depth about 151 km
22	Qt	ePE	04 40 15				Mag - $6\frac{1}{2}$ - $6\frac{3}{4}$ (Pas),
	USCGS H		04 34 53				$5\frac{3}{4}$ - 6 (Pal), 6.6 (Ch)
			37.4 N 95.8 E				



Major Shocks

Date	Station	Phase	h m s	Date	Station	Phase	h m s
22	Wr	ePZ	11 07 05		Wr	ePZ	34
	Qt	ePZE	57		Qt	ePE	58 27
	USCGS H		11 02 33.9		USCGS H		00 53 29.0
			37.2 N 95.7 E				37.2 N 95.8 E
			Chinghai Province,				Chinghai Province,
			China				China
			depth about 25 km				depth about 39 km
22	Lh	ePZ	18 01 17	23	Ch	ePZ	01 45 42
	Wr	ePZ	30		Lh	ePZ	46 28
	Qt	ePZE	02 25		Wr	iPZ	44 d
	USCGS H		17 57 03.6		Qt	ePE	47 35
			37.1 N 95.5 E		USCGS H		01 42 12.2
			Chinghai Province,				37.1 N 96.0 E
			China				Chinghai Province,
			depth about 35 km				China
22	Ch	ePZ	22 14 04				depth about 50 km
		epPZ	31	23	Wr	ePZ	07 21 49
	Lh	ePZ	15 48		USCGS H		07 10 52.0
	Wr	iPZ	16 03 c				7.3 S 128.4 E
	Qt	ePZE	19				Banda Sea
	USCGS H		22 03 36.6				depth about 25 km
			5.5 S 152.4 E	24	Qt	ePZ	08 33 29
			New Britain	25	Wr	ePZ	00 59 53
			depth about 100 km		Qt	ePNE	01 00 02
22	Lh	ePZ	23 33 45		USCGS H		00 48 57.1
	Wr	iPZ	47 c				58.6 N 31.5 W
	Qt	ePE	34 40				South of Greenland
	USCGS H		23 29 14.0				depth about 25 km
			26.8 N 96.0 E	25	Qt	ePE	01 18 14
			Chinghai Province,		USCGS H		01 07 09.6
			China				59.0 N 31.2 W
			depth about 25 km				South of Greenland
23	Ch	ePZ	00 56 27 ±				depth about 25 km
		ePPZ	42	25	Wr	ePZ	11 39 35
	Lh	ePZ	57 21		Qt	ePZNE	04 26

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
26	Qt	ePKP	13	10	44	28	Wr	iPZ			47 d
		epPKP			53			USCGS H 14 33 03.7			
		ePKPZ			57			41.4 S 80.6 E			
	Wr	ePKPZ						Kerguelen Islands region			
		USCGS H 12 51 01.4						depth about 25 km			
		43.2 S 75.6 W									
		Off coast of southern Chile									
		depth about 38 km									
26	Lh	ePZ	19	50	34	28	Qt	ePNE	02	57	13
		eSE			55 24			USCGS H 02 48 13.1			
	Wr	iPZ			51 05 d			16.4 N 120.4 E			
		eSN			56 23			Luzon, Philippine Islands			
		ePZNE			51 09 d			depth about 25 km			
		eSNE			56 31						
		USCGS H 19 44 17.5									
		6.7 N 94.6 E									
		Nicobar Islands									
		depth about 60 km									
27	Wr	ePZ	05	41	23	29	Wr	iPZ	08	10	05
	Qt	ePZ			37			iSN			37
		USCGS H 05 30 44.4						ePZNE			11 04
		3.2 S 125.5 E						eSZNE			12 21
		Ceram Islands						H 08 09 23			
		depth about 82 km						Hindukush region			
27	Wr	ePZ	10	57	47	29	Ch	ePZ	21	11	50 d
		iSZ			58 14			ePNE			12 31
	Qt	ePNE			54 ±			USCGS H 21 00 16.4			
		eSNE			11 00 11			51.8 N 177.1 W			
		H 10 57 13						Andreanof Islands,			
		Hindukush region						Aleutian Islands			
27	Qt	ePZNE	14	44	28			depth about 25 km			



Minor Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
30	Qt	ePZ	10	15	54			eSN	06	43	01
	Wr	ePZ			57			ePZ			37 13
		USCGS H 10 02 52.2						iPZ			38 27 c
		30.3 N 42.4 W						iSZ			46 42
		North Atlantic Ocean						ePZE			38 56 c
		depth about 25 km						eSNE			47 34
		Mag 5 (Pal)						esSNE			49 30 ±
30	Wr	iPZ	10	34	04 c			ePKPKPZ	07	07	02
		iSZ			16			USCGS H 06 28 26.2			
	Lh	ePZ			35 10			22.1 N 142.6 E			
	Qt	ePZN			14			Volcano Islands region			
		H 10 33 47						depth about 257 km			
		33 3/4 N 72 1/4 E						Mag 6 1/2 (Pas)			
		Campbellpur,									
		West Pakistan									
31	Qt	ePZ	01	58	26	31	Qt	ePKPZ	21	38	45
		iSE			59 26			Lh			54
	Lh	ePZ			25 c			epPKPZ			39 00
	Wr	iPZ			34 d			Wr			iPKPZ
		iSN			02 01 28						38 57 c
		H 01 57 06						USCGS H 21 19 04.0			
		25 1/4 N 66 1/8 E						38.2 S 72.7 W			
		about 70 miles						Central Chile			
		west of Karachi,						depth about 25 km			
		Arabian Sea									
		USCGS H 01 57 02.2									
		24.5 N 65.8 E									
		Off coast of									
		West Pakistan									
		depth about 25 km									
31	Ch	iPZ	06	36	33 c						
		ePPZ			37 26						
		ePoPZ			38 11						
		ePPNE			29						
		ePPPZ			39 26						

Date	Phase	h m s	Date	Phase	h m s
	Quetta		6	ePZE	07 38 26
				eSE	40 11
1	ePgE	00 56 58	6	ePE	09 04 03
	eSgE	57 10	6	ePZE	10 36 31
1	ePgZ	09 08 50		eSNE	56
	eSgE	54	6	ePE	11 28 26
1	ePZ	09 45 41	6	ePE	19 28 45
	eSE	46 04	7	ePgE	11 40 53
1	ePZ	19 54 12		eSgE	56
	eSE	37	7	ePE	18 19 26
2	ePE	05 01 48	7	eXE	08 00.5
	eSE	03 07	8	ePgZE	16 01 43
2	ePgE	17 14 39		iSgNE	51
	iSgE	40	8	ePgE	23 31 59 ±
2	eXE	20 45 00		eSgE	32 02
3	ePE	21 45 35	9	ePgZE	02 05 11
4	ePgZE	05 42 41		eSgZE	12
	iSgZE	54	9	ePZE	14 17 24
4	ePE	07 13 20	9	ePZ	15 47 45
	eSE	14 31	10	ePE	08 43 07
4	ePZE	18 24 55		e(S)E	35
	eXE	25 19	10	e(P)E	16 33 25
	e(S)E	49	10	ePE	20 52 51
4	eXE	19 37 48	11	ePE	07 10 25
4	ePE	20 40 21	11	eXE	10 35 25
	eSE	40		eSE	36 12
4	ePZE	20 42 53	11	ePZE	19 53 09
	eSE	43 25	11	ePE	20 36 26
5	eXE	08 39 04	11	ePgE	21 43 02
5	ePE	11 19 40		eSgE	04
5	ePZE	14 08 48	11	ePE	22 32 51
	eSE	09 16		eSE	33 14
5	ePZE	16 52 27	12	ePZ	00 53 24
5	eXE	18 38 26	12	eXE	01 01 24
5	eXE	18 48 46	12	ePgE	10 33 51
5	eXE	19 01 08		iSgE	53
6	eXZE	07 11 47			

Date	Phase	h m s	Date	Phase	h m s
12	eXE	14 18.5	18	ePgZ	14 39 05
12	iPgE	18 23 42		eSgZ	09
	iSgNE	44	19	ePgZ	00 44 17
13	eXE	01 47.5		eSgZ	27
13	iPgNE	02 21 09	19	ePgE	12 58 12
	iSgN	11		eSgE	16
13	eXN	06 15 24	19	ePgNE	21 44 44
13	ePgE	06 26 31 ±		eSgNE	56
	eSgE	33	20	ePgE	00 44 49
13	eXE	06 28.5		eSgNE	45 00
13	ePE	06 34 38	20	eXNE	02 11 32
	eSE	35 55	20	ePgN	08 28 32
13	eXE	11 01 14		eSgE	41
13	ePNE	13 15 50	20	ePgZNE	18 32 45
	eSE	16 12		eSgNE	55
13	ePgNE	15 46 58	20	eXE	21 42 26
	eSgE	47 00	21	ePE	12 31 21
13	eXE	15 59.0	21	ePE	13 05 12
13	ePgE	19 16 49	21	e(P)E	13 40 27
	eSgE	57	21	ePNE	14 25 01
13	ePE	23 30 09	21	ePE	16 34 02
14	ePgNE	04 45 24	21	ePE	17 04 18 ±
	iSgE	38	21	ePE	20 51 33 ±
16	eXE	21 15 12	21	e(P)E	21 43 48
16	ePE	23 00 49	21	ePE	22 28 35 ±
17	ePgZN	02 47 25	22	ePE	13 21 26
	eSgNE	33		eSE	52
17	ePgE	04 16 19	22	ePE	14 20 15
	eSgE	25		eSE	44
17	ePZE	11 07 40	22	ePE	20 33 52
18	ePZ	04 55 52	22	eXE	23 31 29
	eSE	56 16	22	ePE	23 33 00
18	ePZ	05 30 31		eSE	23
	eSZ	59	23	ePgE	00 10 00
18	ePZ	05 50 02		eSgE	06
18	ePZ	09 14 50	23	ePE	04 58 16

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
		35	25	ePE	23 24 57
	eSE		26	ePgNE	08 44 18
23	ePE	14 24 09		eSgE	29
	eSE	25 04	26	ePNE	10 03 34
23	ePgE	16 12 36	26	ePNE	12 26 22
	iSgE	41	26	eSE	42
23	eXE	21 36 33		ePE	12 39.5
23	ePE	22 01 21	26	ePE	18 19 58
23	ePgE	23 25 34	26	eSNE	20 52
	iSgE	35		eXE	21 52 50
24	ePNE	05 53 05	26	eXE	23 56 00
	eSE	23	26	e(P)NE	10 54 25
24	ePNE	06 27 16	27	ePZE	19 49 30
	eSE	35	27	ePgNE	21 21 31
24	ePNE	07 52 22	27	eSgE	39
	eSN	57		ePNE	03 11 35
24	ePE	09 42 59 ±	28	eSE	51
24	ePgNE	22 29 53		ePNE	06 13 22
	eSgE	56	28	eSE	40
25	eXNE	08 55 34		eXNE	10 48 00
	eXNE	16 27 35	28	ePgNE	13 05 17
25	ePE	20 05 47	28	eSgE	29
	eSEN	06 07		e(P)E	19 50 37
25	ePNE	21 08 39	28	e(P)E	08 01 41
	eSE	59	29	ePZNE	08 35 42
25	ePE	21 13 43	29	ePZNE	09 19 46
	eSE	14 03	29	eXZ	09 56 58
25	ePNE	22 23 09	29	ePNE	21 12 31
	eSE	29	29	ePZ	22 01 41
25	ePNE	22 25 16	29	ePE	01 29 13
	eSE	35	30	eSNE	32
25	ePNE	22 27 28		ePgE	01 43 00
	eSE	47	30	eSgNE	03
25	ePE	22 40 13	30	ePE	02 16 22
	eSE	33	30	eSNE	50
25	ePE	22 49 04		ePZ	02 16 48
	eSE	22	30		



Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
30	eXNE	02 17 46	4	ePZ	18 33 41
30	eXE	02 18 29		eSZ	34 09
30	eXE	08 51 00	4	ePZ	19 37 01
30	eXE	20 15 00		eSZ	26
31	ePgE	00 21 46	4	ePZ	22 59 35
	eSgE	56	4	ePZ	23 27 23
31	ePNE	02 08 46	5	ePZ	06 56 34
	eSNE	10 31		iSZ	57 10
31	eXZ	07 06 38	5	ePZ	08 37 15
31	ePZN	10 44 42	5	ePZ	10 38 35
31	ePgE	20 08 56	5	ePZ	14 59 17
	eSgZE	58	5	ePZ	18 58 41
31	ePZ	23 41 16		eSZ	59 12
			6	iPZ	07 10 42 c
				iSZ	11 16
1	ePZ	09 46 26	6	ePZ	07 37 18
1	ePZ	10 05 52		iSZ	38 08
1	ePZ	10 09 54	7	ePZ	01 25 37
1	ePgZ	11 42 59		eSZ	26 30
	eSgZ	43 02	7	ePZ	08 18 41
1	ePZ	12 50 05	7	ePZ	12 53 08
	eSZ	49	8	ePZ	05 24 46
1	ePZ	12 58 40		iSZ	25 12
1	ePZ	14 16 59	8	ePZ	08 33 09
	eSZ	17 42	8	ePZ	14 46 17
2	ePZ	04 14 39	8	iPZ	17 22 03
	eSZ	52		iSZ	52
2	ePZ	05 00 51	8	ePZ	18 04 47
	iSZ	01 22		eSZ	05 17
2	ePZ	12 52 17	9	ePZ	00 00 52
3	ePZ	14 10 02		eSZ	01 12
4	ePgZ	06 37 57	9	ePZ	20 58 19
	eSgZ	38 07		eSZ	45
4	ePZ	10 18 44	10	ePZ	10 02 03
4	ePZ	15 24 48	10	ePZ	11 18 39
	iSZ	25 17		eSZ	19 30



Date	Phase	h m s	Date	Phase	h m s
10	iPgZ	11 59 31	24	ePZ	19 44 54
	iSgZ	44	25	iPZ	21 48 07 d
12	ePZ	17 58 01	26	ePZ	02 11 52
	iSZ	33		iSZ	12 18
13	ePN	06 33 40	26	ePZ	03 23 32
	iSN	34 11	26	ePZ	10 03 17
15	ePZ	10 58 50	27	ePZ	00 35 15
	eSZ	59 19		iSZ	55
15	iPZ	12 55 24 d	27	ePZ	10 51 53
	iSZ	54	28	ePZ	09 10 43
15	ePZ	15 23 16		eSZ	11 06
	iSZ	24 09	28	ePZ	15 19 39
15	ePZ	18 08 14	29	ePZ	10 11 06
15	ePZ	19 42 43	30	ePZ	05 39 47
	eSZ	43 23		iSZ	40 31
15	ePZ	22 44 17	30	ePZ	07 59 06
	eSZ	48		iSZ	49
16	ePZ	07 06 12			
	eSZ	48		Lahore	
16	ePZ	16 07 23	5	iXZ	16 51 41
	eSZ	55	6	eXZ	22 57 01
17	ePZ	06 01 03	8	ePZ	14 45 32
18	ePZ	04 56 46	8	ePZ	16 34 39
18	ePZ	05 56 00	21	e(P)Z	21 34 36
18	ePN	12 38 36	26	ePZ	18 19 42
21	iPZ	15 56 18 c			
22	ePZ	07 45 11		Chittagong	
23	ePZ	02 25 48	9	ePZE	00 29 28
	eSZ	26 17		e(S)NE	57
24	ePZ	06 25 02	14	eXZ	10 43 19
	eSZ	28	15	eXNE	00 47.5
24	ePZ	10 55 48	15	e(P)Z	19 42 10
	eSZ	56 33	16	ePZ	05 28 58 d
24	ePZ	15 53 49			

Date	Phase	h m s	Date	Phase	h m s
18	eXE	18 35 19			
18	e(P)Z	18 55 29			
20	eXE	22 43 52			
21	e(P)Z	21 53 24			
22	eXZ	22 43 03			
23	eXN	05 13 06			