

世界の被害地震の表 (1948年~1963年)*

(含, 津波地震)

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550.346

§ 1. ま え が き

世界の被害地震については、理科年表に若干掲載されているけれども、1945年以降はその記事もあまりくわしくないで、種々調査に不便をきたしている。今回、1948年~1963年までの表(含む、津波を伴った地震)を編集したので参考に供する。

§ 2. 資 料

資料は下記のものを用いた。

i) U. S. Coast and Geodetic Survey : Seismological Bulletin=CGS-SB

ただし、1948年、Apr., 1951年~1953年および Apr., 1962年以降は欠。

ii) U. S. Coast and Geodetic Survey : The Preliminary Determination of Epicenter Cards=CGS-EC

ただし、1948年は欠。

iii) International Seismological Summary=ISS

ただし、1956年以降未調査(図書未整理のため)。

iv) Bureau Central International de Séismologie=BCIS

ただし、1961年6月以降未着。

基礎資料として上記 i)~iii) のうち、いずれか1つを用い(おもに CGS-SB)、その旨各年のはじめに示した。他の資料は、表中に略号で示した。

ただし、日本については以下の諸調査から修正した。

v) 気象庁: 験震時報=QJS (Quarterly Journal of seismology, JMA の略)

vi) 気象庁: 地震月報=JMA-SB (The Seism. Bul. of the Japan Meteorological Agency の略)

一般的傾向として、CGS の資料には被害記事は多いが、速報のためか正確ではないようである。ISS および BC

IS の被害記事は、特に西欧については比較的正確のようであるが、被害記事そのものに記載もれがあるようである。

§ 3. 付図, 附表

i) 第1図被害地震分布図(1948~1963) —ただし、Class C以上—

被害地震の分布は、もちろん大地震の分布とだいたい一致するけれども、被害が人口密度と密接に関係するから、少し様相が異っている。大被害地震はかなり地域的に集中しており、中東からギリシャ、ユーゴ、イタリア、北アフリカ、中南米、日本、台湾、フィリピン、中国などが目立っている。

ii) 第2図津波地震分布図(1948~1963)

この期間中の津波地震のほとんどが太平洋域で起っており(35回)、他は地中海で1回起っているだけである。太平洋域の津波地震のうち、被害を伴ったものは21回、日本付近では18回中9回が被害を伴い、他に比し圧倒的に多い。

iii) 級別・地域別被害地震回数表(1948~1963)

この期間中、100人以上(C Class 以上)の死者を出した地震は23回で、1年に1.4回、また死者を出した地震は(E Class 以上、?も含む)146回で、1年に9.1回の割合になる。

この期間中日本において被害地震は39回起っており、これは世界の約1割に相当し、1年に2.4回の割合になる。このうち、死者を出した地震は13回で、1年に0.8回の割合である。

§ 4. 凡 例

i) Origin Time (震源時) は総て G. M. T. で示し、秒位は切捨て分位にとどめた。

ii) Class は次の定義による。

A : 10,000 ≤ 死者

B : 1,000 ≤ 死者 < 10,000

C : 100 ≤ 死者 < 1,000

* O. Hamamatsu : Outlines of the Disastrous or Tsunami Earthquakes occurred during 1948~1963 in the World (Received Jul. 15, 1964)

** 気象庁地震課

D: $10 \leq \text{死者} < 100$

E: $1 \leq \text{死者} < 10$

? 死者数不明のもの

T: 津波 (Tsunami) を伴ったもの

iii) 資料の略号は § 2. 資料に示した.

iv) R は $6371\text{km} - 33\text{km} = 6338\text{km}$ で, $0.005R$ は震源の深さ $31.6\text{km} + 33\text{km} = 65\text{km}$ である.

v) ローマ数字は改正メルカリ震度.

vi) Magnitude は次の略号で示した.

MG; Gutenberg and Richter: Seismicity of the Earth, Princeton Univ., 1954, 273pp. に記載あるもの.

MJ; 気象庁: 日本付近の主要地震の表 (1926年~1956年), 地震月報別冊 1 (1958), 91 pp. および気象庁: 地震月報 (ただし昭和32年以降) に記載あるもの.

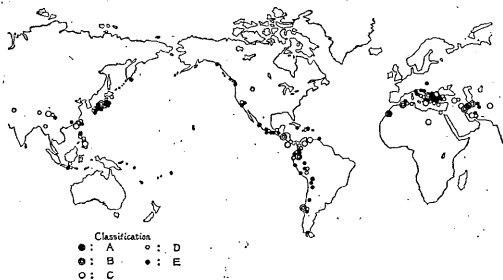
CGS; Mag. (CGS) is *M_b* of Gutenberg and Richter computed from the *P* phase only. The magnitude quoted is an average value determined from data forwarded by cooperating Standard stations and other observatories.

The standard deviation (SD) is given for CGS magnitudes determined from five or more stations.

各 Station で決めたものは下表の略号で示した.

略号	観測所, 地域
Ath	Athenes, Greece
Auc	Auckland, New Zealand
Brk	Berkeley, USA
Buc	Bucharest, Romania
CGS	US Coast and Geodetic Survey
Chr	Christchurch, New Zealand
CLL	Collmberh (Leipzig), Germany
DBN	De Bilt, Netherlands
HRB	Hurbanovo (Ogyalla, Stára Dala), Czechoslovakia
Jer	Jerusalem, Israel
Kew	Kew, England
Kir	Kirna, Sweden
LVV	Lvov (Lwow, Lemberg), USSR
Lwi	Lwiro, Congo
Man	Manila, Phillipin
Mat	Matsushiro, Japan
Mos	Moskva, USSR
OBM	Oulan Bator, Outer Mongolia

略号	観測所, 地域
Ott	Ottawa, Canada
Pal	Palisades, USA
Pas	Pasadena, USA
PMG	Port Moresby, New Guinea
Pra	Praha (Prague), Czechoslovakia
Pru	Pruhonice, Czechoslovakia
Que	Quetta, Pakistan
Rey	Reykjavik, Iceland
Rom	Roma, Italy
Rox	Roxburg, New Zealand
Saf	Safed, Israel
SPC	Skalnate-Pleso, Czechoslovakia
STL	Santa Lucia, Chile
Str	Strasbourg, France
Tac	Tacubaya, Mexico
Tuc	Tucson, USA
Upp	Uppsala, Sweden
Wel	Wellington, New Zealand
Zag	Zagreb (Agram), Yugoslavia



第1図 被害地震分布図 (1948~1963)

ただし Class C 以上



第2図 津波地震分布図 (1948~1963)

級別・地域別被害地震回数表 (1948~1963)

地域	級別										備考
	A	B	C	D	E	?	S	小計	T		
Japan	—	1	—	1	10	1	26	39	18	Ryukyu, Kurile Is. を含む.	
Formosa	—	—	1	3	1	2	1	8	—		
Philippine	—	—	1	1	1	1	4	8	2		
Java	—	—	—	1	1	1	2	5	—	Sumatra を含む.	
Banda Sea	—	—	—	—	—	—	2	2	1		
New Guinea	—	—	—	—	—	—	3	3	2	New Britain Is. を含む.	
Fiji Is.	—	—	—	—	—	1	4	5	3	New Hebrides, Samoa, Tonga を含む.	
New Zealand	—	—	—	—	—	—	10	10	—	Australia を含む.	
Mongolia	—	—	—	—	—	—	2	2	—		
China	—	—	—	2	2	—	—	4	—	Burma を含む.	
India	—	—	1	2	—	2	1	6	—	Tibet, Pakistan を含む.	
Afganistan	—	—	1	—	—	1	3	5	—	Hindu Kuch を含む.	
Iran	1	2	3	1	3	1	4	15	—		
Iraq	—	—	—	—	—	1	1	2	—	Israel, Lebanon を含む.	
Turkey	—	—	2	6	3	2	9	22	1		
Greece	—	—	1	1	7	4	15	28	—		
Yugoslavia	—	1	—	—	5	—	5	11	—	Albania を含む.	
Italy	—	—	—	1	2	—	9	12	—		
Switzerland	—	—	—	—	1	—	6	7	—	Germany, Hungary, Austria を含む.	
Spain	—	—	—	—	1	—	8	9	—	France, Portugal を含む.	
Algeria	1	1	—	2	—	—	6	10	—	Morocco, Tunisia を含む.	
Africa	—	—	—	—	—	—	4	4	—	Central, Southern Africa.	
Egypt	—	—	1	1	—	—	—	2	—	Libya を含む.	
England	—	—	—	—	—	—	2	2	—	Iceland を含む.	
Argentina	—	—	—	—	—	—	4	4	—		
Chile	—	1	—	1	4	3	17	26	2		
Peru	—	—	—	3	4	3	6	16	1		
Bolivia	—	—	—	—	2	1	2	5	—		
Ecuador	—	1	1	4	3	—	11	20	1	Colombia を含む.	
Venezuela	—	—	1	—	1	—	1	3	—	Trinidad を含む.	
C. America	—	1	—	1	—	—	7	9	—		
W. Indies	—	—	—	—	2	1	3	6	—		
Hawaii Is.	—	—	—	—	—	—	7	7	—		
Mexico	—	—	—	1	6	—	13	20	1		
USA	—	—	—	2	3	—	60	65	—		
Canada	—	—	—	—	—	—	—	0	1		
Alaska	—	—	—	—	1	—	2	3	1	Aleutian を含む.	
Kamchatka	—	—	—	—	1	—	1	2	1		
小計	2	8	13	34	64	25	261	407	36		

[注] A : 10,000 ≤ 死者 B : 1,000 ≤ 死者 < 10,000 C : 100 ≤ 死者 < 1,000 D : 10 ≤ 死者 < 100
 E : 1 ≤ 死者 < 10 ? : 死者数不明のもの S : 小被害 (死者なし) T : 津波地震

Outlines of the Disastrous or Tsunami Earthquakes
occurred during 1948~1963 in the World

Class, Origin time (GMT), Location of Epicenter and Remarks

1948 (from ISS)

- T, ? Jan. 24^d17^h46^m 10.9 N, 122.1 E, Philippine Is. Destructive on the island of panay, especially at Ilo-Ilo and Jaro. Many casualties.
Crevasses more than 100 meters long were formed, large landslides on the hillsides and the lower plantations, cracking of the principal water conduits, and destruction of fishing banks by sea action.
- E Mar. 28^d01^h30^m (BCIS): 19°03'S, 65°16'W, Bolivia. Plusieurs maisons détruites et presque tous les édifices endommagés à Sucre: 3 morts
- T Apr. 17^d16^h11^m (JMA-SB): 33.1 N, 135.6 E, 40km. S off Honshu, Japan. Tsunami, Kushimoto 33cm. $M_J=7.2$, $M_G=7.3$, $M=7.2$ (Pas), $7\frac{1}{2}$ (Str).
Apr. 22^d10^h42^m 38.8 N, 20.6 E, Creece. Destructive on the island of Leucade. Felt at Preveza, Agrinion,..... $M=6\frac{3}{4}$.
May 09^d02^h09^m 31.5 N, 131.8 E, Japan. Slight damage. $M_J=6.7$, $M=7\sim7\frac{1}{4}$ (Str), $6\frac{3}{4}\sim7$ (Pas), $6\frac{3}{4}$ (Auc).
- ? May 11^d08^h55^m 17.4 S, 71.0 W, 0.005 R. Peru. Damage and casualties heavy, particularly at Moquequa. $M=7\frac{1}{4}\sim7\frac{1}{2}$ (Pas), 7 (Wel).
- E May 28^d05^h36^m 13.1 S, 76.2 W. Peru. (BCIS): Grands dégâts, 4 morts à Canete; dégâts à Chincha,..... $M=6\frac{3}{4}\sim7$ (Pas).
- E Jun. 13^d06^h33^m 43.5 N, 12.2 E. Italy. Destructive at San Sepulero (Arezzo), 1 killed, 4 injured.
- E Jun. 15^d11^h44^m (QJS): 33.8 N, 135.5 E, vs. Japan. 2 killed, 33 injured, 60 buildings demolished. $M_G=6.9$, $M_J=7.0$, $M=7$ (Pas, Str).
- B** Jun. 28^d07^h13^m (QJS): 36.1 N, 136.2 E, 20 km. Japan. 3,769 killed, 22,203 injured, 36,184 buildings demolished. $M_G=7.3$, $M_J=7.3$, $M=7\frac{1}{4}$ (Pas), $7\frac{1}{4}\sim7\frac{1}{2}$ (Str).
- E Jun. 30^d12^h21^m 38.8 N, 20.6 E. Greece. Destructive N.W. of Leucade. 6 dead, 8 injured.
- Jul. 20^d11^h02^m 16.6 S, 73.6 W, 0.005 R. Peru. Slight damage at Caraveli and Chuquibamba. $M=7\frac{1}{4}$ (Pas).
Aug. 18^d21^h12^m 41.5 N, 16.1 E. Italy. Damage in the regions of Foggia and Gargans, in particular at S. Giovanni-Rotondo,.....2,205 houses damaged.
Aug. 25^d06^h09^m 24.4 S, 64.6 W. Argentina. Damage at Salta. $M=7\frac{1}{2}$ (Pas), 7 (Wel).
- T Sep. 08^d15^h09^m 21.0 S, 174.0 W. Tonga Is. Tsunami at Pogo Pogo, in Samoa, and as far as Hawaii. $M=8$ ca (Pas, Str), $7\frac{3}{4}$ (Wel).
Oct. 05^d20^h12^m 37.9 N, 58.6 W. Iran. Destructive at Askhabad and in the province of Chorrassan, Iran.
- E Oct. 08^d19^h01^m 27.7 N, 103.6 E. China. Destructive at Chaotung and Yunnan. 3 dead, 43 injured, and 310 houses damaged.
- E Dec. 04^d00^h22^m 21.6 N, 106.7 W. Mexico. Damage with casualties in the Isles Las Tres Marias. (BCIS): 1 mort, plusieurs blessés..... $M=7\frac{1}{4}$ (Pas), $6\frac{3}{4}$ ca (Str), 7 (Wel).
Dec. 04^d23^h43^m (BCIS): California, USA, 33°55'N, 116°28'W, quelques dégâts à palm

Class, Origin time (GMT), Location of Epicenter and Remarks

Spirings, Los Angeles, Indio. $M=6\frac{1}{2}\sim 6\frac{3}{4}$ (Pas).**1949** (from CGS-SB)

- Jan. 20^d13^h25^m (JMA-SB): 35.6 N, 134.6 E, 20 km. Japan. Slight damage. $M_J=6.5$
- Mar. 04^d10^h19^m 37 N, 70 E, 230 km. Hindu Kush Range, Afghanistan. $M=7.5$ (Pas) Destructive in west Punjab.
- E Apr. 13^d19^h55^m 47.1 N, 122.7 W, h =slightly greater than normal. Western Washington. $M=7.1$ (Pas) Approximately \$ 25 million property damage in Seattle, Tacoma and Olympia areas. 8 killed, many injured. $M=6$ (Str).
- D Apr. 20^d03^h29^m 38 $\frac{1}{2}$ S, 72 $\frac{1}{2}$ W, 70 km. Central Chile. $M=7.4$ (Pas), 7.0 (Str), 7 $\frac{1}{4}$ (Tuc). Destructive in Angol and Traiguén. 57 killed, extensive property damage.
- Apr. 24^d04^h22^m (BCIS): 27 N, 55 E, Golfe Persique. dégâts et victimes à Bender-Abbas (Trieste). $M=6$ (Str), 6 $\frac{1}{2}$ (Pra).
- Apr. 25^d13^h55^m (BCIS): 20 S, 69 $\frac{1}{2}$ W, 100 km. Région Côtière du Chili Septentrional, destructeur à Iquique (Bogota),..... $M=7\frac{1}{2}$ (Pas), 7 $\frac{1}{4}$ (Tuc), 7 $\frac{3}{4}$ (Wel).
- E Jul. 11^d16^h10^m 34.0 N, 132.5 E, 40 km. Near south coast of Honshu, Japan. 2 killed and minor property damage in Kure City. $M_J=6.2$
- E Jul. 23^d15^h03^m 38 $\frac{1}{2}$ N, 26 $\frac{1}{2}$ E,—. Near west coast of Turkey. Destructive in Izmer and Karaburun. 1 killed, several injured. Heavy property damage in Maunara and Kardamyia, northern part of island of Chios, where 4 dead and several hundred houses collapsed. $M=6\frac{3}{4}$ (Pas), 7 (Tuc), 6 $\frac{3}{4}\sim 7$ (Pra).
- B Aug. 05^d19^h08^m 1 S, 78W, 60 km. Central Ecuador. Destructive in Amvato, Guano, Pelileo, Patate, and Pillaro. 4,000~6,000 killed, \$ 7 $\frac{1}{2}$ million property damage. (BCIS): Plus de 3.000 morts et 5,000 blessés,..... $M=6\frac{3}{4}$ (Pas, Str), 7 (Tuc).
- C Aug. 17^d18^h43^m 39 N, 40 $\frac{1}{2}$ E,—. Eastern Turkey. 320 killed, Aga Kevy destroyed. Also destructive in Ezusum, Karilova, and Bingel. (BCIS): 231 morts..... $M=6\frac{3}{4}$ (Pas, Tuc, Pra), 6 $\frac{1}{2}$ (Str).
- T Aug. 22^d04^h01^m 54 N, 133 W,—, Queen Charlotte Islands. Felt from Portland, Oreg. to southern Alaska. 2 feet tidal wave at Kitchikan, Alaska. $M=7\frac{1}{2}$ (Ott), 8.1 (Pas, Str), 8.2 (Tuc), 8 $\frac{1}{2}$ (Pra).
- T Oct. 19^d21^h00^m 6 S, 154 $\frac{1}{2}$ E, 60 km. Solomon Is. 2 feet sea wave recorded at Rabaul, New Britain. $M=7\frac{1}{4}$ (Pas, Str, Pra, Wel).
- Nov. 04^d20^h42^m (BCIS): 32 N, 116 $\frac{1}{2}$ W,—. Basse-Calefornie (Mexique), Sérieux dégâts à Guadaloupe,..... $M=5.7$ (Pas).
- Nov. 18^d01^h19^m 32°45'N, 118°15'W,—. Terminal Is., Calif., USA. $M=3.7$ (Pas). \$ 9 million damage to oil wells. Felt at Long Beach and San Pedro.
- E Dec. 17^d06^h53^m 54 $\frac{1}{2}$ S, 70 W,—. Southern Magellanes Prov., Chile. Destructive in Punta Arenas. 1 killed. $M=7\frac{3}{4}$ (Pas, Str, Wel), 7 $\frac{3}{4}\sim 8$ (Pra).
- Dec. 17^d15^h07^m (BCIS): 54 S, 71 W,—. Terre de Fen, à 80 km au Sud de Punta Arenas (Chile). quelques dégâts à Punta Arenas;..... $M=7\frac{1}{2}$ (Pas, Str), 7 $\frac{3}{4}$ (Wel).
- E Dec. 25^d23^h24^m 36.7 N, 139.7 E, vs. Honshu, Japan. 8 killed, 2 missing, 162 injured. Several thousand houses damaged. $M_G=6\frac{1}{4}$, $M_J=7.2$, $M=6\frac{3}{4}$ (pas), 6.8 (Rom), 6 $\frac{1}{4}$ ca (Str).
- E,T Dec. 29^d03^h03^m 17 $\frac{1}{2}$ N, 121 $\frac{1}{2}$ E,—. Northern Luzon, Philippine Is. Heavy property damage

Class, Origin time (GMT), Location of Epicenter and Remarks

along northwest coast of Isabella Province, and minor damage in Manila. 1 killed by sea wave near Mercedes. $M=7.2$ (Pas), $7\frac{1}{4}$ (Wel, Str), $7\frac{1}{2}\sim 7\frac{3}{4}$ (Pra).

1950 (from CGS-SB)

- D Jan. 19^d17^h27^m 27 $\frac{1}{2}$ N, 53E,—. Near south coast of Iran. 20 killed. many injured. (BCIS): une trentaine de morts.
- Feb. 01^d23^h30^m (BCIS): 50 S, 164 E,—. Nouvelle-Zélande.....faibles dégâts dans l'île Stewart. $M=6.8$ (Pas), $6\frac{3}{4}$ (Rom, Pra), 7 ca (Wel).
- Feb. 26^d00^h06^m 34°37'N, 119°05'W,—. Near Sespé Hot Springs, Calif., USA. $M=4.7$ (Pas). Minor damage in Ventura and Santa Paula.
- Apr. 20^d17^h19^m 34 N, 3E,—. Northern Algeria. Damage in Ksara d'El Richa and d'Enfours. Felt in Tadmout and Aflou.
- Apr. 26^d07^h05^m (JMA-SB): 33.8N, 135.8 E, 40 km. Japan. Slight damage. $M=6\frac{3}{4}$ (Pas) $6\frac{1}{2}$ (Pra).
- D May 21^d18^h37^m 14S, 72W,—. Central Peru. $M=6$ (Pas). Destructive in Cuzco and San Sebastian. 83 killed, 200 injured. (BCIS): 94 tués, 274 blessés, (ISS): 80 dead and 200 hurt.
- May. 30^d01^h16^m 19 $\frac{1}{2}$ N, 156 W,—. Hawaii Is. $M=6\frac{1}{4}$ (Pas). Slight damage along Kona coast.
- D Jun. 19^d12^h36^m 6 S, 113 E,—. Java Sea, near northeast coast of Java. Destructive in Surabaya, Grisee, and Sedajes, 17 killed, 50 injured, and 50 houses destroyed. $M=6\frac{1}{2}$ (Pas), 7 ca (Wel).
- E Jun. 22^d20^h43^m 1 S, 78 $\frac{1}{2}$ W, 100 km. Central Ecuador. 2 killed in Saquisili. Buildings cracked in Latacunga and Pujili.
- C Jul. 09^d02^h35^m 8 N, 73 W,—. Northern Colombia. Destructive in Arboleta, Cucutilla, Salazar de las Palmas, Cucuta and Mutizca, Colombia, and San Cristobal, Venezuela, 211 killed and 500 injured. Damage estimated at \$ 5 million. (ISS): 126 dead and 40 injured.
- Jul. 27^d11^h29^m 33°07'N, 115°34'W,—. Near Calipatria, Calif., USA. $M=4.8$ (Pas). Minor damage at Brawley and Niland.
- Jul. 29^d14^h36^m 33°07'N, $M=5.5$ (Pas). Estimated \$ 50,000 property damage at Calipatria, Brawley, Niland, and Westmoreland.
- C Aug. 03^d22^h18^m 10N, 69 $\frac{1}{2}$ W,—. Northwestern Venezuela. $M=6\frac{3}{4}$ (Pas). Destructive at Tocoyo. 100 killed.
- C Aug. 15^d14^h09^m 28 $\frac{1}{2}$ N, 97E,—. Assam. $M=8.6$ (Pas, Str), $8\frac{1}{2}$ (Pra), $8\frac{1}{4}$ (Brk). 574 killed. Damage estimated at \$ 20 million. Damage reported in Bramaputra River Valley. (ISS): killed 532 persons.
- Aug. 31^d17^h22^m 45N, 17 $\frac{1}{2}$ E,—. Northern Yugoslavia. 70 buildings destroyed at Dubrovici. $M=5.1$ (Pra).
- E Sep. 05^d04^h09^m 42 N, 13 $\frac{1}{2}$ E, —. Central Italy. 2 killed, 35 injured, 21 villages damage. $M=5.1$ (Rom).
- Sep. 10^d03^h21^m 35.3N, 140.5E, 30~40 km. Japan. Slight damage. $M_J=6.5$, $M=7$ (Pas), $6\sim 6\frac{1}{4}$ (Pra), 6 (Str).
- Sep. 23^d06^h23^m 35N, 25 $\frac{1}{2}$ E,—. Southeastern Crete. 4 injured and 400 buildings damaged.

Class, Origin time (GMT), Location of Epicenter and Remarks

- Oct. 05^d16^h09^m 10½N, 85½W,—. Near coast of Costa Rica. M=7.7 (Pas), 7¼ (Brk), 8 (Pra). 7½~7¾ (Wel). Moderate property damage and several injured at Puntarenas and San Jose.
- T Oct. 08^d03^h23^m 4 S, 128 E,—. Banda Sea. Felt at Amboina. Seismic sea wave reported. M=7½ (Str, Pra), 7½~7¾ (Wel); 7.6 (Pas).
- E Dec. 09^d21^h38^m 24 S, 67 W, 100 km. Northern Argentina-Chile border. 1 killed and several injured at Calama, Chile. Also felt at Arica, Chile and board S.S. Santa Margarita at 22°42'S, 71°10'W. M=8 (Pas, Pra), 7.7 (Wel), 8? (Wel).
- E Dec. 10^d02^h50^m 14 S, 76 W, 60 km. Near coast of southern Peru. 4 killed, 12 injured and moderate property damage at Ica. M=7 (Pas, Brk), 6.4 (Rom).
- Dec. 14^d13^h24^m 40°05'N, 120°04'W,—. Near Herlong, Calif., USA. Felt in northeastern California and western Nevada. Slight damage at Herlong. M=5.8 (Brk), 5.6 (Pas).
- Dec. 14^d14^h15^m 17 N, 98½W,—. Oaxaca, Mexico. Slight damage in the Federal District. M=7.3 (Pas), 7½ (Brk), 7¼ (Rom, Pra).

1951 (from ISS)

- Jan. 08^d18^h32^m (CGS-SB): 35.4 N, 140.1 E, 40 km. Near southeast coast of Honshu, Japan. Minor damage at Yokohama and Choshi. M_J=6.2, M=6½ (Pas).
- Jan. 10^d19^h15^m (CGS-SB): 43 S, 173 E,—. Near east of south Island. New Zealand. Minor damage at Cheviot and Christchurch. M=5½ (Wel).
- Feb. 10^d03^h27^m 39.9 S, 176.9 E,—. New Zealand. Slight damage at Napier and Hastings. Felt widely throughout central and southern districts of North Island. M=6 ca (Wel).
- Feb. 25^d01^h51^m (BCIS): 46N, 10½E,—. Italie du Nord, Val Giudicaria. Quelques dégâts dans le Val Giudiearia (presse).
- Mar. 10^d10^h38^m 38.1 N, 3.8 W,—. Southern Spain. Serious damage in the epicentral region. M=5 ca (Str).
- Mar. 14^d09^h46^m (CGS-SB): 51 N, 7 E,—. West central Germany. Minor damage.
- E Apr. 08^d21^h38^m Distinctive at Iskenderun (Alexandretta) with casualties. (BCIS): 36.4N, 37.5 E, 100km. 6 morts, 10 blessés, 13 maisons écroulées (presse). M=5¾ (Str), 6¼ (Pra).
- B May 06^d23^h03^m (I) 13.0 N, 87.8 W, 0.010 R. (II) 23^h08^m El Salvador. Destructive in complete destruction of Jucuapa, considerable damage at Chinameca and surrounding villages, more than 1,000 dead, formation of crevasses and hot springs. 13.5 N, 88.4 W, depth 100 km. (Str). M=(I): 6¼ (Tac), (II): 6½ (Tac).
- May 15^d22^h54^m (BCIS): 45.3 N, 9.5 E,—. Italie du Nord. Pavia et Milan, Avec quelques dégâts,.....M=5.5 (Rom).
- May 19^d15^h54^m 38.1 N, 3.7W,—. Felt strongly in southern Spain and throughout Portugal with damage in the provinces of Jaen and Cordoba. M=5¼ (Pra).
- May 21^d03^h43^m (BCIS): 42.8 N, 13.8 E,—. Italie Centrale.....la province de Teramo (quelques dégâts à Campli).....
- May 31^d20^h56^m 18.6 N, 121.2 E, 0.010R. North of Luzon. Intensity VI at Lsoag, with damage and casualties.
- Jun 07^d04^h06^m (BCIS): Au Sdu Wetterstein Gebirge (Autriche) Ressenti VI~VII à Barwies (légers dégâts),.....

Class, Origin time (GMT), Location of Epicenter and Remarks

- E Jul. 09^d00^h03^m 16.0 N, 96.5 W,—. Mexico. 1 killed, slight damage at Miahuatlan, in the state of Oaxaca. $M=6\frac{1}{4}$ (Pas, Tac), $6\frac{3}{4}$ (Str).
- Jul. 29^d10^h53^m 36.7 N, 121.1 W,—. USA. Slight damage at Pinnacles,..... $M=5\frac{1}{4}\sim 5\frac{1}{2}$ (Pas), $4\frac{1}{2}\sim 4\frac{3}{4}$ (Brk).
- Aug. 02^d09^h57^m 37.1 N, 138.5E, 0~10km. Japan. Slight damage in the epicentral region. $M_J=5.2$
- Aug. 05^d15^h12^m 34.2 N, 36.0 E,—. Damage at Saidé.
- Aug. 08^d20^h56^m (BCIS): Au N du Grand Sasso (Italie). 42.6 N, 13.5E,—. Dégâts matériels en Italie centrale (Presse).
- D Aug. 13^d18^h33^m 40.8 N, 33.4 E,—. Turkey. (BCIS): 50 tués, 208 blessés, 2,038 animaux perdus, 3,354 maisons démolies, 13,373 maisons endommagées. $M=6\frac{3}{4}$ (Pas), $6\frac{1}{2}$ (Brk), $6\frac{1}{4}$ (Str), 7 ca (Pra).
- Aug. 21^d10^h56^m 19.2 N, 155.1W,—. Hawaii. Damage on the coast of Kona at Hookena, Kainaliu.....with crevasses 15 cm. wide on the coastal road. $M=7$ (Brk), $6\frac{3}{4}$ (Pas), $6\frac{1}{2}$ (Rom), $6\frac{3}{4}\sim 7$ (Wel).
- Sep. 01^d06^h56^m 43.1N, 13.2 E,—. Italy. Some damage (press report). (BCIS): 1 blessé à Gualdo,(presse). $M=5.4$
- Oct. 18^d07^h26^m (JMA-SB): 41.4 N, 142.1 E, 40 km. Japan. Slight damage. $M_J=6.5$, $M=6\frac{1}{4}$ (Pas, Rom).
- C Oct. 22^d03^h29^m 23.9 N, 121.7 E,—. Formosa. (BCIS): plus de 100 morts, 800 blessés (presses). $M=7.6$ (Str), 7.5 (Rom), 7 (Pas); $7\frac{3}{4}\sim 8$ (Pra), $6\frac{1}{2}$ (Brk), $7\sim 7\frac{1}{4}$ (Wel).
- Oct. 31^d20^h58^m 36.8 N, 121.4 W,—. USA. Slight damage. $M=4\frac{3}{4}$ (Brk).
- ? Nov. 24^d18^h47^m 22.9 N, 121.5 E,—. Formosa. Many casualties and great damage to building in region between Hualien and Taitung. $M=7\frac{1}{4}$ (Pra), $6\frac{1}{4}$ (Pas), $6\frac{1}{2}$ ca (Wel, Chr), 7 (Hrb).
- D Nov. 24^d18^h50^m (BCIS): 23.5 N, 121.5 E,—. Prés de la côte E de Formose. 17 morts, 385 blessés, 800 maisons endommagées (presse). $M=7\frac{3}{4}$ (Str), $7\frac{3}{4}\sim 8$ (Pra), 7.4 (Rom), $7\frac{1}{2}$ ca (Pas), 7 ca (Brk).
- Dec. 01^d37^h34^m CGS-EC: 17 N, $94\frac{1}{2}$ W, 100km. Oaxaca, Mexico. Slight property damage. $M=7$ (Pas), $6\frac{1}{2}\sim 6\frac{3}{4}$ (Brk).
- Dec. 12^d01^h37^m 16.5N, 96.9 W, 0.020 R. Mexico. Felt strongly in central and south-east Mexico, with damage to buildings at San Carlos, Jantepec,..... $M=7$ (Pas), $6\frac{1}{2}\sim 6\frac{3}{4}$ (Brk), 6.5 (Rom, Tac), $6\frac{1}{4}\sim 6\frac{1}{2}$ (Pra).
- Dec. 26^d00^h46^m 32.8N, 118.4 W,—. UAS. Slight damage at Del Mar,..... $M=5\frac{1}{2}\sim 5\frac{3}{4}$ (Pas).

1952 (from ISS)

- D Jan. 03^d06^h03^m 40.4 N, 41.6E,—. Turkey. Destructive at Hasankale ($39^{\circ}39'N$, $41^{\circ}40'E$). (BCIS): 94 tués, 262 blessés, 1,570 maisons démolies ou endommagées (d'après Istanbul). $M=5.6$ (Rom).
- Jan. 31^d20^h55^m 4.0 S, 29.6 E,—, Tanganyika. Felt strongly at Entebbe (Uganda); slight damage in the Kigoma region of Tanganyika.
- Feb. 14^d21^h02^m 7.3N, 76.5W,—. Colombia. Slight damage in the province of Antioquia and Choco, at Medellin and Giraldo. $M=6\frac{3}{4}$ (Pas).

Class, Origin time (GMT), Location of Epicenter and Remarks

- Feb. 20^d09^h19^m 16.0 S, 74.5 W, 0.010 R. Peru. Collapse of buildings in the billage of Huanuca.
- D,T Mar. 04^d01^h22^m (QJS) 42.15N, 143.85 E, 45 km. Hokkaido, Japan. On the coast of Kushiro waves of from four to five metres were recorded. 28 killed, 287 injured, 5 missing, 815 houses were destroyed. $M=8\frac{1}{4}$ (Pas), 8 (Brk), 8.5 (Str), $M_J=8.1$, $M_G=8.3$.
- E Mar. 07^d07^h32^m (QJS) : 36.45 N, 136.20 E, 20 km. Honshu, Japan. 7 killed, 8 injured, 4 houses were partially destroyed. $M_G=6\frac{1}{2}$, $M_J=6.8$.
- T Mar. 09^d17^h03^m (QJS) : 41.7 N, 143.5 E, 0~20 km. Hokkaido, Japan. Slight damage at Hokkaido. Tsunami: 30 cm. at Hachinohe. $M_G=7.1$, $M_J=7.0$, $M=7$ (Pas), $7\frac{1}{2}$ (Rom), $7\frac{1}{4}\sim 7\frac{1}{2}$ (Pra).
- Mar. 19^d08^h13^m 37.7 N, 15.1 E,—. Italy.with damage at Linera and San Venerine.
- Apr. 01^d00^h37^m 48.0 N, 113.8 W,—. UAS. Slight damage at Flathead Lake,.....
- Apr. 02^d18^h34^m 16.6N, 100.2 W,—. Mexico. Damage at Acapulco. $M=6\frac{1}{4}\sim 6\frac{1}{2}$ (Pas), $6\frac{1}{4}$ (Tac).
- Apr. 09^d16^h29^m (CGS-EC) : 35.4 N, 97.8 W, 125 km. USA. Slight Property damage in central Oklahoma. $M=5.5$ (Pas).
- Apr. 19^d09^h58^m 7.2 N, 72.1 W, 0.005 R Venezuela. Destructive in several places in the Departments of Santander in Columbia and Tachira in Venezuela. $M=6\frac{3}{4}\sim 7$ (Pas), $6\frac{1}{4}$ (Pra), 6.3 (Rom).
- May 23^d22^h12^m 19.2 N, 155.5 W,—. Hawaii.with slight damage in the Kona region. $M=6$ (Pas).
- ? Jun. 11^d00^h31^m 31.5 S, 68.6 W,—. San Juan, Argentina. Damage and casualties at San Juan in Argentina. $M=7$ (Pas), $6\frac{1}{2}$ (Rom), $6\frac{1}{4}$ (Wel).
- Jun. 20^d16^h42^m 35.7 N, 0.7 W,—. Algeria. Damage, Jean Memoz, Fornaka,.....
- E Jul. 17^d16^h09^m (QJS) : 34.45 N, 135.80 E, 70 km. Honshu, Japan. 9 killed, 139 injured, 20 buildings demolished..... $M_G=7.0$, $M=7$ (Pas), $7\frac{1}{4}$ (Rom, Man), $6\frac{3}{4}$ (Wel).
- D Jul. 21^d11^h52^m 35.0 N, 119.0W,—. Tahachapi, USA. 12 dead, 18 seriously hurt, several hundred others slightly hurt. $M=7\frac{1}{2}$ (Pas).
- E Jul. 29^d07^h03^m 35.4 N, 118.6 W,—. Tahachapi, USA. 2 killed. $M=6\frac{1}{2}$ (Pas), $6\frac{1}{4}\sim 6\frac{1}{2}$ (Brk).
- D Aug. 17^d16^h02^m 30.5 N, 91.5 E,—. India. 55 killed, 157 injured, with 850 buildings destroyed at Pondgo and Tangur (according to Poona).
- Aug. 22^d02^h25^m 45.0 N, 8.3 E,—. Italy. Much damage at Asti.
- E Aug. 22^d22^h41^m 35.3 N, 118.9 W,—. UAS. Destructive at Bakersfield with 2 dead and 35 injured, water mains and telephone lines broken. $M=6$ (Pas), 6.1 (Brk).
- ? Oct. 18^d04^h29^m 18.3 N, 73.3 W,—. Haiti. Much damage and many casualties at Anse de Veau. $M=6$ (Pas, Tac).
- T Nov. 04^d16^h58^m 52.6N, 160.3 E,—. Kamchatka.....which was felt as far away as Hawaii, New Zealand, Japan, and West coast of North America. Slight damage in Japan. $M_G=8\frac{1}{4}$, $M=8\frac{1}{2}$ (Brk, Pra), $8\frac{1}{4}\sim 8\frac{1}{2}$ (Upp), $8\frac{1}{4}$ (Pas, Str, Man, Lis), 9 (Rom), 8 (Dbi).
- Nov. 22^d07^h46^m (CGS-EC) : 35.8 N, 121.1W,—. USA. San Luis Obispo County, Calif., USA. Slight property damage. $M=6$ (Pas), 6.1 (Brk), $6\sim 6\frac{1}{4}$ (Kir), $5\frac{3}{4}$ (Upp).

Class, Origin time (GMT), Location of Epicenter and Remarks

1953 (from CGS-EC)

- Jan. 07^d12^h00^m 9½ N, 83 W,—. Costa Rica. Several injured and slight property damage.
- C** Feb. 12^d08^h15^m 35 N, 54½ E,—. Northern Iran. (ISS): Much damage at Toronde (35.4 N, 55.0 E) and in its neighbourhood. 979 dead, 1,800 houses damaged, 7 villages destroyed and 3 others damaged. Toronde fault. M=6½ (Pra), 6½~6¾ (Rom), 6¼~6½ (Kir), 7 (Pas), 6¼ (Str).
- C** Mar. 18^d19^h06^m 40 N, 27½ E,—. West Turkey. (ISS): Violent destructive shock with extensive damage, chiefly at Yenice, Gönen, and Chan. 244 killed and 9,000 houses destroyed as well as 500 public buildings. A fault appeared.....M=7¾ (Pas), 8 (Brk), 7.4 (Rom), 7.5 (Hur).
- T** Apr. 23^d16^h24^m 4 S, 154 E,—. New Britain. (ISS): Damage and faulting in New Britain, with a tsunami (Press). M=7½~7¾ (Pas), 7½ (Upp, Wel), 7¾ (Kir, Rom, Pra), 7¾~8 (Dbi).
- ? May 02^d18^h37^m Near west coast of Turkey. (ISS): Destructive at Karabarun and Izmis, with many casualties. M=5¾ (Upp, Kir), 5½ (Ath).
- ? May 06^d17^h16^m 36½ S, 73 W, 100 km. Central Chile. Several killed and minor property damage in Concepcion and vicinity. M=7½~7¾ (Pas), 7¼ (Tac), 7¾~8 (Pra), 7½ (Rom, Kir, Upp).
- Jun. 14^d04^h17^m 33 N, 115¾ W,—. Imperial Valley Calif., UAS. Slight property damage. M=5.4 (Pas), 6 (Brk).
- C** Aug. 12^d09^h23^m 38½ N, 21E,—. Near west coast of Greece. (ISS): Complete destructive of the towns and villages of Cephalonia; According to Press reports, 455 people were killed, 912 seriously injured, 27,659 houses were demolished, and 93,000 people rendered homeless. M=7¼ (Pas, Brk).
- Sep. 04^d14^h07^m 32 S, 71 W,—. Near coast of central Chile. Several injured, minor property damage. M=6¾~7 (Pas).
- ? Sep. 05^d14^h18^m 38 N, 23 E,—. Eastern Greece. Several casualties and moderate property damage. M=5.5~6.
- ? Sep. 10^d04^h06^m 35 N, 32 E,—. Near west coast of Cyprus. Heavy casualties and extensive property damage. M=6½ (Pas).
- ? **T** Sep. 14^d00^h26^m 18½ S, 178½ E,—. Fiji Is. Several killed and extensive property damage. Seismic sea wave. M=6¾ (Pas).
- Sep. 26^d03^h34^m 39.6 N, 119.8 W,—. Western Nevada, USA. Slight damage at Reno. M=5 (Pas), 5½ (Brk).
- T** Nov. 25^d17^h48^m (QJS): 34.3 N, 141.8 E, 40~60 km. Near south coast of Honshu, Japan. Slight damage. Seismic sea wave. M=8¼ (Pas), 8¼~8½ (Brk), M_J=7.5, M_G=8¼. Tsunami: Choshi 3 m.
- ? Nov. 30^d13^h21^m 39 N, 21½ E,—. Near west coast of Greece. (ISS): Several killed and much damage.
- ? Dec. 07^d02^h05^m 22 S, 68 W, 100 km. Northern Chile. Heavy casualties and extensive property damage. M=7¼ (Pas), 6 (Brk).
- ? Dec. 12^d17^h31^m 3½ S, 81 W,—. Near coast of Peru. Several killed and heavy property damage in Tumbes and Corrales. M=7¾ (Pas).

Class, Origin time (GMT), Location of Epicenter and Remarks

Dec. 20^d09^h19^m Central Chile. Slight damage at Illapel.

Dec. 23^d04^h45^m 1 N, 77 W,—. Southwestern Columbia. Many injured and extensive property damage in Narino State, Columbia. (ISS): At least 35 people injured and 250 houses destroyed in the Guitarillas region.

1954 (from CGS—SB)

Jan. 12^d23^h33^m 35.0 N, 119.1 W,—. Near Wheeler Ridge, Calif., USA. M=5.9 (Pas). Minor property damage.

Feb. 05^d15^h17^m 17½ N, 92½ W, 100km. Chiapas, Mexico. M=6¼ (Pas): Extensive property damage at Chilon, Petalcingo, Tila, and Wajalon.

Feb. 08^d14^h19^m 22½ S, 68 W, 150 km. Northern Chile-Bolivia border. Minor damage at Calama, Chile.

Feb. 15^d12^h03^m 16½ N, 100W,—. Depth slightly greater than normal. Near coast of Mexico. Minor damage at Acapulco.

Mar. 08^d08^h17^m 38N, 20½E,—. Near west coast of Greece. Minor damage at Cephalonia. M=5½ (Pra); 5¼~5½ (Kir), 6.5 (Saf).

Mar. 19^d09^h54^m 33.3 N, 116.1W,—. Santa Rosa Mt., Calif., USA. Slight property damage. M=6.2 (Pas).

Mar. 29^d06^h17^m 37 N, 3½ W, 650 km. Near south coast of Spain. M=7¼~7½ (Pas). Extensive property damage at Granada and Malaga. Felt in Morocco.

Mar. 30^d18^h41^m 20 N, 150 W, —. Near northeast coast of Hawaii, T.H. M=6½(Pas). Minor damage at Hilo.

Apr. 25^d20^h33^m 36.8 N, 121.8 W,—. Near coast of central Calif., USA. M=5.3 (Pas). Minor damage at Watsonville and Gilroy.

Apr. 29^d10^h49^m 29½ N, 112½W,—. Gulf of Calif., foreshock. M=7¼~7½. Minor damage in western Mexico.

Apr. 29^d11^h34^m 29½ N, 112½W,—. Gulf of Calif., mainshock. M=7½~7¾ (Pas). Minor damage in western Mexico.

D Apr. 30^d13^h02^m 39½ N, 22 E,—. Central Greece. 26 killed, 157 injured. \$ 10 million damage. (BCIS): 25 tués et 157 blessés, 25,000 personnes sans abri. M=7½ (Upp), 7 (Pas), 6¾~7 (Brk).

? May 12^d21^h16^m 37.6 N, 22.0 E,—. Greece. M=5~6. (ISS): Much damage and numerous casualties in Arcadia.

May 13^d14^h46^m 17 N, 95½ W, 100 km. Oaxaca, Mexico. M=6¼ (Pas). Minor damage.

May 25^d22^h03^m 39½ N, 22 E,—. Central Greece. Several injured and moderate property damage. M=5¾ (Ath), 5½ (Upp, Pra).

D Jul. 02^d02^h45^m 13 N, 124½ E,—. Southeastern Luzon, Philippine Is. M=6¾ (Pas). 13 killed, many injured, and extensive property damage at Sorsogon, Bacon, and Legaspi City.

Jul. 03^d00^h32^m 3½ S, 29 E,—. Near Lake Tanganyika, Belgian Congo. Damage at Uvira. M=5½ (Pra).

Jul. 06^d11^h13^m 39½ N, 118½ W,—. Near Fallon, Nevada, USA. M=7 (Pas): Several injured and moderate property damage.

Jul. 23^d04^h33^m 30½ S, 71½ W, 60km. Central Chile. M=6¾(Pas). 3 injured minor property

Class, Origin time (GMT), Location of Epicenter and Remarks

damage in Coquimbo.

- E Jul. 26^d20^h15^m 41 S, 73 W,—. Central Chile. $M=6\frac{1}{4}\sim 6\frac{1}{2}$ (Pas). 1 killed and moderate property damage in Osorno.
- Aug. 02^d10^h18^m 39 $\frac{1}{2}$ N, 118 $\frac{1}{2}$ W,—. Near Fallon, Nevada, USA. $M=5\frac{1}{4}\sim 5\frac{1}{2}$ (Pas). Minor property damage.
- Aug. 24^d05^h51^m 39.5 N, 118.5 W,—. Near Fallon, Nevada, USA. $M=6.8$ (Pas). Minor damage at Fallon and Lovelock. (ISS): 39.5 N, 118.3 W. Considerable damage to Roger's Dam in Lovelock District.
- B Sep. 09^d01^h04^m 36 N, 1 $\frac{1}{2}$ E,—. Northern Algeria. 1,400 killed and major property damage. (BCIS): 1,400 morts, 3,000 blessés, dégâts considérables aux habitations,…… $M=6\frac{3}{4}$ à 7 (Kir), 6.7 (Pra), $6\frac{3}{4}$ (Pas), $6\frac{3}{4}\sim 7$ (Brk), $6\frac{1}{2}\sim 6\frac{3}{4}$ (Upp).
- Oct. 03^d11^h18^m 60 $\frac{1}{2}$ N, 151 W, 100 km. Kenai Peninsula, Alaska. $M=6\frac{3}{4}\sim 7$ (Pas). Minor damage at Anchorage, Seward, Valdez, and Homer.
- Oct. 12^d19^h23^m Northern Algeria. Property damage at Carnot, Attafs, and Dupleix.
- Nov. 02^d08^h24^m 7 $\frac{1}{2}$ S, 119 E,—. Sumbawa Island region. $M=6\frac{1}{2}$ (Pas). Extensive damage at Bima.
- Nov. 12^d12^h26^m 31 $\frac{1}{2}$ N, 116 W,—. Lower Calif., USA. $M=6.1$ (Pas). Extensive damage at El Alamo. Felt in southern California.
- E Dec. 04^d18^h31^m 11 N, 61 W,—. 60 km. Near Trinidad. $M=6\frac{1}{4}\sim 6\frac{1}{2}$ (Pas). 1 killed, several injured and extensive property damage.
- Dec. 16^d11^h07^m 39.3 N, 118.0 W,—. Near Fallon, Nevada, USA. $M=7.4$ (Pas). Moderate property damage.
- Dec. 21^d19^h56^m 40.9 N, 123.9 W,—. Humboldt County, Calif., USA. $M=6\frac{1}{2}\sim 6\frac{3}{4}$ (Pas). Several injured and extensive property damage.
- Dec. 23^d16^h27^m 38 N, 21 E,—. Near west coast of Greece. Minor property damage. $M=6$ (Ath), $5\frac{3}{4}\sim 6$ (Kir), $5\frac{3}{4}$ (Pra).

1955 (from CGS-SB)

- Jan. 03^d01^h07^m 39 N, 22 E,—. Central Greece. Slight damage at Kentron. $M=5\frac{1}{2}$ (Ath), 5 (Pra).
- Jan. 05^d23^h42^m 16 S, 167 $\frac{1}{2}$ E,—. New Hebrides Is. $M=6\frac{3}{4}\sim 7$ (Pas). Damage on Malekula.
- Jan. 25^d07^h24^m Tennessee-Arkansas-Missouri border. Slight property damage.
- Feb. 10^d04^h06^m 11 $\frac{1}{2}$ S, 77 $\frac{1}{2}$ W, Slightly deeper than normal. Near coast of Peru. Minor damage near Lima.
- ? Feb. 18^d22^h48^m 30 $\frac{1}{2}$ N, 67 E,—. Pakistan. Many killed and moderate property damage in Quetta area. $M=6\frac{1}{4}$ (Upp), 6 (Rom).
- ? Feb. 21^d19^h46^m Near east coast of Greece. Several casualties and moderate property damage at Volos.
- Mar. 11^d23^h32^m 8 N, 124 E,—. Near northwest coast of Mindanao, Philippine Is. Several injured and minor damage at Ozamis City.
- Mar. 28^d14^h45^m 38 N, 21 E,—. Near southwest coast of Greece. Damage at Pirgos. $M=5\frac{3}{4}$ (Kir).
- C Mar. 31^d18^h17^m 8 N, 124 E,—. Near northwest coast of Mindanao, Philippine Is. About 432

Class, Origin time (GMT), Location of Epicenter and Remarks

- killed and several million dollars damage to property and agriculture in Ilagan, Osamis City, and Lake Lanao area. $M=7\frac{1}{2}$ (Pas).
- Apr. 10^d17^h38^m 8 N, 125 E,—. Philippine Is. aftershock. Many injured moderate property damage in Lanas Province. $M=6\frac{1}{2}$ (Pas).
- Apr. 13^d20^h45^m 37 $\frac{1}{2}$ N, 22 E,—. Southern Greece. Minor damage at Kalamai and Tripolis. (BCIS): 5 personnes blessés. 500 maisons endommagées à Sparte, 800 maisons endommagées à Kalamae (press). $M=6.3$ (Jer), $6\frac{1}{4}$ (Upp, Kir), $5\frac{3}{4}$ (Ath), $5\frac{1}{4}$ (Pra).
- D Apr. 14^d01^h28^m 30N, 101 $\frac{1}{2}$ E,—. Sikang province, China. $M=7\frac{1}{4}$ (Pas). 39 killed and 113 injured at Kangting City.
- E Apr. 19^d16^h47^m 39 $\frac{1}{2}$ N, 23 E,—. Near east coast of Greece. 1 killed, many injured, and extensive property damage at Volos. (BCIS): $M=6\frac{1}{4}$ (Upp, Pra), 6 (Kir). 1 mort, 41 blessés.
- T Apr. 19^d20^h24^m 30 S, 72 E,—. Near coast of Central Chile $M=7$ (Pas). Extensive damage from water waves at Tongoy and La Serena.
- E Apr. 21^d07^h18^m 39 $\frac{1}{2}$ N, 23 E,—. Near east coast of Greece. 6 killed, many injured, and extensive damage at Volos. (BCIS): 7 morts et 108 blessés. $M=5.9$ (Pra), 6 (Kir), $5\frac{3}{4}$ (Ath), $5\frac{1}{4}$ (Lwi).
- May 07^d11^h50^m 39 N, 122 $\frac{1}{2}$ W,—. Near Clear Lake, Calif., USA. $M=4\frac{3}{4}\sim 5$ (Pas).
Minor damage at Lower Lake.
- May 11^d11^h04^m 0, 78 W,—. Ecuador. $M=6\frac{3}{4}$ (Pas). Minor damage in Carchi and Imbabura provinces.
- May 21^d15^h39^m 15 $\frac{1}{2}$ S, 173 W, 100km. Samoa Islands. Minor damage at Apia.
- May 22^d04^h57^m Austria-Germany border. Minor damage at Innsbruck, Austria.
- Jun. 23^d13^h41^m (JMA-SB): 35.2N, 133.4 E, 20 km. Honshu, Japan. Slight damage. $M_J=5.1$.
- Jul. 16^d07^h07^m 37 $\frac{1}{2}$ N, 27 E,—. Dodecanese Is. $M=6\frac{3}{4}\sim 7$ (Pas). Extensive damage on Samoa Islands and in Western Turkey.
- Jul. 20^d21^h00^m $\frac{1}{2}$ N, 78 $\frac{1}{2}$ W,—. Northern Ecuador. Extensive damage at Cotacachi. $M=6$ (Tac).
- E Jul. 27^d01^h20^m (JMA-SB): 33.75 N, 134.3 E, 0~10 km. Honshu, Japan. 1 killed. 5 injured. $M_J=6.0$.
- Jul. 28^d01^h59^m 40 $\frac{1}{2}$ S, 71 $\frac{1}{2}$ W,—. Chile-Argentina border. Extensive damage in Valdivia, Cautin, and Osorno provinces, Chile.
- D Sep. 01^d17^h33^m 10 N, 84 $\frac{1}{2}$ W,—. Costa Rica. $M=5.9$ (Tac). 10 killed and 5 hundred homeless in Toro Amarillo.
- Sep. 04^d11^h29^m 22 S, 69 W, 100km. Northern Chile. Minor damage at Calama.
- Sep. 05^d02^h01^m 37 $\frac{1}{2}$ N, 122 W,—. Santa Clara County, Calif., USA. $M=5.8$ (Pas). Minor damage at San Jose.
- D Sep. 12^d06^h09^m 32 $\frac{1}{2}$ N, 30 E,—. Off coast of Egypt. $M=6\frac{3}{4}$ (Pas). 20 killed many injured and extensive damage in the Nile Delta area.
- Oct. 19^d01^h45^m (JMA-SB): 40.3 N, 140.2 E, 0~10 km. Honshu, Japan. 2 injured, 52 houses partial destroyed. $M_J=5.7$.
- Oct. 24^d04^h10^m 37.9 N, 121.9W,—. Contra Costa County, Calif., USA. $M=5\frac{1}{2}$ (Pas). Moderate damage in Walnut Creek and Oakland.

Class, Origin time (GMT), Location of Epicenter and Remarks

- Nov. 04^d22^h43^m 33½ S, 69½ W, 100 km. Mendoza Prov., Argentina. M=6.7 (Pas). Minor damage at Talca, Chile:
- Dec. 17^d06^h07^m 32.9 N, 115.5 W,—. Imperial County, Calif., USA: M=5.4 (Pas). Minor damage at Brawley and El Centro.
- 1956** (from CGS-SB)
- Jan. 03^d00^h25^m 33¾ N, 117½ W,—. Santa Ana Mt., Calif., USA. M=4.7 (Pas). Slight damage at Santa Ana.
- Jan. 06^d12^h15^m 40½ N, 26E,—. Greece-Turkey border. Slight damage in the Dardanelles region. 5¾ (Ath), 5.5 (Pra), 5¼ (Mos).
- Jan. 08^d07^h11^m 17 N, 99½ W,—. Guerrero, Mexico. M=6½ (Pas). Many injured and heavy damage at Acapulco.
- Jan. 08^d20^h54^m 19 S, 70W,—. Northern Chile. M=7¼ (Pas). Slight damage at Arica.
- E Jan. 12^d05^h46^m 47½ N, 20 E,—. Northern Hungary. Heavy casualties and extensive property damage. (BCIS): 2 morts, nombreux blessés, dégâts matériels importants à Taksony, Soroksar et Dunaharaszti au S de Budapest. M=6.0 (Kir), 5¾ (Mos), 5.6 (Pra).
- Jan. 16^d23^h37^m ½ S, 80½ W,—. Near coast of Ecuador. M=7¼~7½ (Pas). Heavy property damage at Portoviejo and Bahia de Caraquez. Felt on board M/S Équateur at 1.06 S, 81.08 W.
- Feb. 09^d14^h32^m 31.5 N, 116.0 W,—. Lower Calif., USA. M=6.8 (Pas). Minor damage in Imperial Valley, Calif., USA.
- Feb. 14^d00^h52^m (JMA-SB): 35.7 N, 139.9 E, 50 km. Near east coast of Honshu, Japan. M_J=6.0, M=5¾~6 (Pas). Several injured and minor property damage at Tokyo.
- E Feb. 15^d12^h50^m 8½ S, 74½ W, 150 km. Péru. 2 killed in Callejon-Huaylas region.
- E Feb. 20^d20^h31^m 39½ N, 30½ E,—. Turkey. 4 killed and several injured at Istanbul, extensive damage at Eskisehir. (BCIS): 2,000 maisons endommagées à Eskisehir. M=6.5 (Upp, Kir), 6¼ (Sap), 6 (Ath), 5¾ (Mos), 5.6 (Pra).
- T Mar. 05^d23^h29^m (JMA-SB): 44.3 N, 144.1 E, 0~20 km. Off Hokkaido, Japan. Slight damage. Tsunami: 40 cm at Abashiri. M_J=5.8, M_G=6½~6¾.
- ? Mar. 16^d19^h43^m 34 N, 36 E,—. Lebanon. Many killed in Chouf and surrounding villages. Extensive property damage. M=6½ (Jer), 5.4 (Upp, Kir), 4¾ (Mos).
- E Apr. 19^d18^h38^m 37.2 N, 3.7 W,—. Southern Spain. Several killed, many injured, and extensive property damage at Albolote, Atarfe and Granada. (BCIS): à Granada. 7 morts, 60 blessés. Dégâts matériels importants dans.....
- May 31^d08^h55^m Salta Province, Argentina. Minor damage at Salta.
- C Jun. 09^d23^h13^m 35½ N 67½ E,—. Afghanistan. M=7¼~7½ (Pas). Many killed and extensive property damage. (BCIS): 350 à 400 morts, principalement à la suite de l'inondation.
- D,T Jul. 09^d03^h11^m 37 N, 26 E,—. Aegean Sea. M=7½ (Pas). 43 killed and many injured. Several towns destroyed on Thira and Ios Islands. 10 ft. seismic sea wave reported on Aegean Islands.
- Jul. 09^d09^h56^m 20 N, 73 W, 100 km. Near coast of Haiti. M=6½~6¾ (Pas). Moderate property damage at Port de Paix.
- D Jul. 16^d15^h07^m 22 N, 95½ E, 100 km. Central Buruma. M=7 (Pas). 30 killed and major

Class, Origin time (GMT), Location of Epicenter and Remarks

- property damage at Mandalay and Sagaing.
- ? Jul. 21^d15^h32^m 23 N, 70 E,—. Western India. $M=6\frac{1}{2}$ (Pas). Many killed and major property damage at Anjar.
- Aug. 16^d02^h09^m 37N, 8 $\frac{1}{2}$ W,—. Near southwest coast of Portugal. Slight damage at Sagres.
- E Sep. 29^d21^h20^m (JMA-SB): 37.95 N, 140.55 E, 20km. Honshu, Japan. 1 killed, 1 injured. $M_J=6.1$.
- Sep. 29^d23^h20^m (JMA-SB): 35.5 N, 140.2 E, 70 km. Central Honshu, Japan. 4 injured and minor property damage in Tokyo. $M=6\frac{3}{4}\sim 7$ (Pas).
- Oct. 01^d18^h04^m 18 $\frac{1}{2}$ N, 77 W,—. Jamaica. Minor damage at Minor damage at Moneague, Port Moria. and St. Ann's Bay.
- Oct. 24^d14^h42^m 12 N, 87 W,—. Near coast of Nicaragua. $M=7\frac{1}{4}$ (Pas). Minor damage at Managua. Felt in southern El Salvador.
- ? Oct. 31^d14^h03^m 26 $\frac{1}{2}$ N, 54 $\frac{1}{2}$ E,—. Southern Iran. $M=6\frac{3}{4}$ (Pas). Many killed and extensive property damage in Laristan.
- Nov. 02^d16^h04^m 39 N, 23 E,—. Near east coast of Greece. Extensive property damage at Volos. (BCIS): 14 blessés,..... $M=5\frac{3}{4}$ (Ath, Upp), 5.1 (Pra, Kir), 5 (Mos).
- Nov. 09^d13^h06^m 17 N, 94 W, 150 km. Southern Mexico. $M=6\frac{1}{4}\sim 6\frac{1}{2}$ (Pas). Slight damage in Oaxaca' Province.
- Dec. 18^d17^h53^m 30 $\frac{1}{2}$ N, 35 $\frac{1}{2}$ E,—. Israel-Jordan border region. Minor damage at Haifa, Israel. Felt at Jerusalem and Tel Aviv, Israel, and Ksara, Lebanon. $M=5\frac{1}{4}\sim \frac{1}{2}$ (Jer), 5 (Mos), 5 $\frac{3}{4}$ (Upp), 6 (Lwi).
- Dec. 28^d14^h24^m 39 S, 177 $\frac{1}{2}$ E, 150 km. Near coast of North Island, New Zealand. $M=6\frac{1}{4}$ (Pas). Moderate damage in Gisborne and vicinity.
- Dec. 31^d17^h37^m 38 $\frac{1}{2}$ N, 119 W,—. Nevada foreshock. $M=5\sim 5\frac{3}{4}$ (Brk). Minor damage at Hawthorne.
- Dec. 31^d17^h39^m 39 N, 119 W,—. Western Nevada, USA. $M=5.4$ (Brk). Minor damage at Hawthorne.

1957 (from CGS-SB)

- Feb. 11^d15^h42^m 53 N, 1 W,—. England. Slight property damage at Nottinghamshire. Felt in north central England.
- D Feb. 20^d04^h41^m 36 $\frac{1}{2}$ N, 9 E,—. Northern Tunisia. 13 killed, many injured and extensive property damage in Souk-el-Khemis area. Also felt in Algeria. (BCIS): 13 morts, 102 blessés, nombreux sans abri, dégâts matériels (Presse). $M=5.6$ (Kew, Upp, Kir), 5 $\frac{1}{4}$ (Spa), 5 (Hub).
- D Feb. 23^d20^h26^m 24 N, 122 E,—. Formosa. $M=7\sim 7\frac{1}{4}$ (Pas). 11 killed, many injured and extensive property damage at Hualien and Taipei.
- Feb. 28^d16^h56^m (JMA-SB): 40.2 N, 140.3 E, 0~10km. Northern Honshu, Japan. Slight Property damage.
- E Mar. 02^d00^h27^m 18 $\frac{1}{2}$ N, 78 W,—. Jamaica. $M=6\frac{3}{4}$ (Pas). 3 killed and 5 injured. Moderate property damage at Kingaton and Montego Bay.
- E Mar. 08^d12^h21^m 39 $\frac{1}{2}$ N, 23 E,—.Eastern Greece. $M=6\frac{1}{4}$ (Pas). 2 dead, many injured, and moderate property damage at Farsala, Larissa, Veletinon and Volos.

Class, Origin time (GMT), Location of Epicenter and Remarks

- T Mar. 09^d14^h22^m 51.3 N, 175.8 W,—. Andreanof Islands, Aleutian Is. $M=7\frac{3}{4}\sim 8$ (Pas). Seismic sea wave caused destruction of 2 villages and \$ 3 million damage on Oahu and Kauai, Hawaii T. H.
- Mar. 18^d18^h56^m 34 N, 119 $\frac{1}{2}$ W,—. Near coast of southern Calif., USA. $M=4\frac{1}{2}\sim 4\frac{3}{4}$ (Pas). Minor damage at Oxnard and Ventura.
- Mar. 22^d19^h44^m 37.9 N, 122.6 W,—. Northern Calif., USA. $M=5\frac{1}{4}\sim 5\frac{1}{2}$ (Pas). Minor damage at Daly City and San Francisco.
- Apr. 22^d13^h43^m 7 N, 72 W,—. Colombia-Venezuela aftershock. Felt Caracas and Tachiro, Venezuela. 180 houses destroyed in Tachiro.
- D Apr. 25^d02^h25^m 36 $\frac{1}{2}$ N, 29 E,—. Near south coast of Turkey. $M=7\sim 7\frac{1}{4}$ (Pas). 15 killed at Fethiye, Turkey. Many injured and extensive property damage throughout southeastern Turkey and the Island of Rhodes.
- E May 24^d02^h37^m 3 N, 76 $\frac{1}{2}$ W,—. Colombia. $M=6\frac{3}{4}$ (Pas). 2 killed, many injured and moderate property damage.
- D May 26^d06^h33^m 41 N, 31 E,—. Bolu Province, Turkey. $M=7$ (Pas). 66 killed, many injured, and major property damage.
- Jun. 11^d18^h49^m 18 N, 120 $\frac{1}{2}$ E,—. Near coast of Luzon, Philippine Is. Moderate property damage at Vigan. Felt throughout northern and central Luzon. $M=6.8$ (Upp, Kir), 6.7 (Rom), 6 $\frac{1}{2}$ (Mos).
- ? Jun. 14^d11^h36^m 32 N, 67 E,—. Southern Afghanistan. Several killed and heavy property damage at Kandahar, Khalakhund and Mohammed Qila. $M=4\frac{1}{2}$ (Mos).
- Jun. 22^d23^h50^m 1 $\frac{1}{2}$ S, 137 E,—. Near north coast of New Guinea. $M=7\frac{1}{4}$ (Pas). Extensive damage in the Geelvink Bay area.
- Jun. 27^d00^h09^m 56 $\frac{1}{2}$ N, 116 E,—. Northeast of Lake Baikal, USSR. $M=7\frac{1}{2}$ (Pas). Damage at Chita.
- B Jul. 02^d00^h42^m 36 N, 53 E,—. Iran. $M=7\frac{1}{4}\sim 7\frac{1}{2}$ (Pas). About 2,000 dead, many injured, and extensive property damage throughout northern Iran.
- Jul. 07^d05^h58^m 38 $\frac{1}{2}$ N, 40 E,—. Turkey. 7 injured and minor damage in Bingol Province. $M=6\frac{1}{4}\sim 6\frac{1}{2}$ (Mat), 5.5 (Upp).
- Jul. 07^d16^h11^m 6 $\frac{1}{2}$ S, 156 E,—. Solomon Islands. $M=6\frac{3}{4}$ (Pas). Slight damage at Buin. Felt at Aropa, Karoola, Kieta and Rabaul.
- Jul. 08^d15^h30^m 14 $\frac{1}{2}$ N, 91 W, 150 km. Guatemala. $M=6$ (Brk). Moderate damage in western Guatemala and Chiapas, Mexico. Felt in western El Salvador.
- D Jul. 28^d03^h40^m 17N, 99W,—. Guerrero, Mexico. $M=7\frac{1}{2}$ (Pas). 68 dead, many injured, and extensive property damage in Alcapulco and Mexico City.
- Aug. 07^d15^h44^m Northern Peru. Minor damage at Talara.
- Aug. 23^d11^h42^m 24 N, 122 E,—. Off east coast of Formosa. $M=5\frac{1}{4}$ (Mos). Moderate damage at Taipei.
- E Sep. 05^d11^h36^m Southern Iran. $M=5$ (Mos). 1 killed, many injured in Jahrom. Moderate property damage in Jahrom and Kerman.
- Sep. 20^d10^h01^m 36 $\frac{1}{2}$ N, 71 E, 200 km. Hindu Kush. Destructive in Kandahar, Afghanistan.
- ? Oct. 19^d18^h28^m 23 $\frac{1}{2}$ N, 122 E,—. Near east coast of Formosa. $M=6\frac{1}{2}\sim 6\frac{3}{4}$ (Pas). Several killed at Hotai and slight damage at Taipei.

Class, Origin time (GMT), Location of Epicenter and Remarks

- Oct. 24^d20^h07^m 29 S, 68 W,—. La Rioja Province, Argentina. Moderate damage at Jague, Vinchina and Villa Castelli.
- Nov. 10^d19^h20^m (JMA-SB): 34.3 N, 139.35 E, 0 km. Off Honshu, Japan. 2 houses destroyed etc.
- Nov. 29^d22^h19^m 21 S, 66W, 200 km. Southern Bolivia. M=7 $\frac{3}{4}$ ~8 (Pas). Slight damage in northern Chile.
- Dec. 02^d12^h48^m 37 N, 2 E,—. Near coast of Algeria. Slight damage at Tenes.
- Dec. 04^d03^h37^m 45 $\frac{1}{2}$ N, 99 $\frac{1}{2}$ E,—. Outer Mongolia. M=7.9 (Pas). 20 injured, 13 missing and damage in Bayankhongor, Ara Khangoi and Uber Khangai district.
- B** Dec. 13^d01^h44^m 34 $\frac{1}{2}$ N, 48 E,—. Iran. M=7 $\frac{1}{4}$ (Pas). 1,392 killed, many injured. Farsinaj destroyed.
- 1958** (from CGS-SB)
- D** Jan. 15^d19^h14^m 16 $\frac{1}{2}$ S, 71 $\frac{1}{2}$ W, 100 km. Southern Poru. M=7 (Pas). 21 killed, 90 injured and extensive property damage.
- D,T** Jan. 19^d14^h07^m 1 $\frac{1}{2}$ N, 79 $\frac{1}{2}$ W, 60 km. Near coast of Ecuador. M=7 $\frac{1}{2}$ (Pas). 14 killed, many injured, and extensive property damage at Esmeraldas, Palmas and Guayaquil. Seismic sea wave damage at Esmeraldas and Guayaquil.
- Jan. 19^d14^h43^m 1 $\frac{1}{2}$ N, 79 W, 60 km. Ecuador aftershock. M=6 $\frac{3}{4}$ (Pas). Slight damage in northern Ecuador.
- Jan. 31^d06^h32^m 40 S, 176 $\frac{1}{2}$ E,—.North Island, New Zealand. Slight damage at Dannevirke. Felt in southern part of North Island.
- Feb. 19^d19^h25^m 8 S, 108 E,—. Near south coast of Java. Moderate damage in Priangan.
- ?** Mar. 11^d00^h25^m 25 $\frac{1}{2}$ N, 125 E, 60 km. Ryukyu Islands. M=7 (Pas). Several killed, many injured on Okinawa. Felt strongly on Ishigaki and Miyko; also felt at Aparri, Basco and Calayan.
- E** Apr. 14^d21^h32^m 1N, 79 $\frac{1}{2}$ W,—. Near coast of Ecuador. M=6 $\frac{3}{4}$ ~7 (Pas). 1 killed, 12 injured and minor property damage at Esmeraldas. Also felt at Quito and Ibarra.
- May 09^d02^h40^m 36 $\frac{1}{2}$ N, 27 $\frac{1}{2}$ E,—. Dodecanese Is. Slight damage on Rhodes.
- Jun. 27^d05^h44^m 13 N, 88 $\frac{1}{2}$ W, 60 km. Near coast of El Salvador. M=6 (Pas). Slight damage insouthern El Salvador.
- E,T** Jul. 10^d06^h15^m 58.6 N, 137.1 W,—. Southeastern Alaska. M=8 (Pas). 6 killed and moderate property damage. Extensive fissuring and avalanche activity. Portions of Khantaak Island submerged in Yakutat Bay. Waves estimated as more than 100 feet in Lituya Bay.
- (BCIS): trois morts à Khantaak Island (Yakutat Bay), à Dry Bay et à Lituya Bay (deux pêcheurs noyés): VII à Sitka; Raz-de-marée destructeur en particulier dans lile du Cénotaphe Port-des-Français (Lituya Bay); avalanches, glissements de terrain; séisme lié à la faille du Beau-Temps ("Fairweather Fault"; surface macroséismique 400,000 milles carrés. Voir R. J. Brazee and James N. Jordan, Preliminary Notes on southeastern Alaska Earthquake, Earthquake Notes, vol, XXIX N°3, p. 36-40, 1958,.....
- Jul. 14^d05^h25^m 34 N, 120 W,—. Near coast of Calif., USA. M=4 $\frac{3}{4}$ ~5 (Pas). Slight damage at Carpenteria.

Class, Origin time (GMT), Location of Epicenter and Remarks

- C Aug. 16^d19^h13^m 34½ N, 48E,—. Iran, Many killed and extensive property damage in western Iran. (BCIS): Région de Kirmanshah et de Nahavand, 137 morts, 200 blessés, 71 village endommagés (d'après B.S.S.A.). M=6¾ (Pas).
- Aug. 28^d09^h36^m 33½ S, 69½ W,—. Chile-Argentina border. Minor damage at Las Melosas, Chile.
- Sep. 01^d14^h30^m 18 S, 65 W,—. Bolivia. Many injured and extensive property damage at Aiquile.
- E Sep. 04^d21^h51^m 33½ S, 69½ W,—. Chile-Argentina border. M=6¾~7 (Pas). 3 killed and major property damage at San Jose and Volcan. Felt at Rancaqua and Santiago.
- Sep. 21^d16^h18^m 36 N, 49 E,—. Iran. Heavy damage at Karksar.
- Sep. 30^d08^h45^m 47 N, 10 E,—. Switzerland-Austria border. Slight damage at Landeck.
- E Oct. 20^d01^h12^m 9½ S, 112 ½ E,—. Off south coast of Java. M=6½ (Pas). 7 killed at Blitar 1,856 injured, 95 houses destroyed, 206 heavily damage. Felt at Jogjakarta, Malang and Surabaya.
- T Nov. 06^d22^h58^m (JMA-SB): 44.3 N, 148.5 N, 80 km. Kurile Islands. Slight damage. Tsunami: 2 m at Kirittapu, 1.02m at Hachinohe. M=8~8¾ (Pas).
- Nov. 25^d02^h23^m 43 N, ½ W,—. Southwestern France. Slight damage in Pyrenees region. M=4½ (Pra).
- Dec. 01^d03^h21^m 32.3 N, 115.8 W,—. California-Mexico border. M=5.7 (Pas). Minor damage at Calexico, El Centro and San Diego. Felt throughout southern California and western Arizona.
- Dec. 24^d20^h35^m 18 S, 169 E,—. New Hebrides Islands. Slight damage at Port-Vila. Felt at Epi, Nguna and Vate. M=5.4 (Wel).

1959 (from CGS-SB)

- Jan. 02^d05^h19^m 48N, 4 W,—. Near coast of Brittany. France. M=5.2 (Pas, Pra). Slight damage in Channel Islands.
- Jan. 11^d04^h27^m 36½ N, 29E,—. Near coast of Turkey. M=4¾ (Pra). Extensive property damage at Karacaoren.
- Jan. 13^d20^h35^m 34½ S, 71W, 100 km. Central Chile. Slight damage at Santiago.
- T Jan. 22^d05^h10^m (JMA-SB): 37.55N, 142.35 E, 30km Near coast of Honshu, Japan. M_J=6.8, M=6¾~7 (Pas). Felt in northern Honshu. Small seismic sea-wave at Miyako.
- Jan. 30^d22^h16^m (QJS): 43.35 N, 144.4 E, 20 km. Hokkaido, Japan. 2 houses destroyed etc. M_J=6.1.
- Feb. 27^d20^h56^m (JMA-SB): 27½ N, 128 ½ E,—. Ryukyu Islands. Minor damage. M_J=6.0.
- Mar. 02^d23^h27^m 37 N, 122 W,—. Near coast of Calif., USA. M=4.9 (Pas). Slight damage at Gilroy, Hollister and Santa Cruz.
- Apr. 05^d10^h47^m 44 N, 7E,—. Southeastern France. 2 injured and moderate property damage. Also felt in Italy. M=5.5 (Upp, kir).
- Apr. 23^d20^h58^m 37½ N, 80½ W,—. Virginia-west Virginia border. Slight damage in Giles County, Virginia.
- Apr. 26^d14^h45^m 46½ N, 13 W,—. Italy-Austria border. Minor damage in northern Italy; felt also in southern Austria.

Class, Origin time (GMT), Location of Epicenter and Remarks

- E Apr. 26^d20^h40^m 25N, 122½E, 150 km. Near northeast coast of Formosa. M=7½~7¾ (Pas).
2 killed; minor damage at Taipei.
- E May 04^d07^h15^m 52½ N, 159 ½ E, 60 km. Near east coast of kamchatka. M=8 (Pas). 1 killed
and 13 injured.
- May 22^d06^h57^m 40 S, 176 E,—. North Island, New Zealand. Minor damage at Blenheim,
Picton and Wellington. M=6.0 (Wel), 5¼~5½ (Mat).
- E May 24^d19^h17^m 17½ N, 97 W, 100 km. Oaxaca, Mexico. M=6¾~7 (Pas). 5 killed, 10
injured and minor property damage. Felt also in Mexico City.
- E Jun. 14^d00^h11^m 20½ S, 68 W, 100 km. Southwestern Bolivia. M=7¼~7½ (Pas). 1 killed and
minor damage in northern Chile.
- Aug. 06^d03^h44^m 48 N, 120 W,—. Washigton State. Minor damage at Chelan and Wenatchee.
- D Aug. 15^d08^h57^m 23 N, 121 E,—. Formosa. M=6¾~7 (Pas). 16 killed, many injured and
extensive property damage.
- Aug. 16^d18^h41^m 37½ N, 22 E,—. Greece. M=5.5 (Upp, Kir), 5¼ (Ath), m=5¼ (Kew).
Damage at Diavolitsion, Kalliroi, Katsaro, and Zacharo. Felt throughout southern
Greece.
- D Aug. 15^d06^h37^m 44°50'N, 111°05'W,—. Hebgen Lake, Montana, USA. M=7.1 (Pas). Many
killed and injured. Major property damage. (BCIS): Dix morts, une centaine de disparus;
barrage du Lac d'Hebgen fissuré. M=7¾~8 (DBN), 7¾ (Mos, Lwi), 7.7 (pra), 7.6
(Zag, Kew), 7.5 (Upp, Kir, Pas), 7.3 (Rey), 7¼ (PMG), 7.1 (Mat), 6.8 (Tac).
- D Aug. 26^d08^h25^m 18N, 94½W,—. Vera Cruz, Mexico. M=6¾ (Pas). 14 killed, many injured
and extensive damage throughout Tehuantepec Isthmus. (BCIS): 20 morts, plusieurs
blessés, dégâts sur tout l'isthme de Tehuantepec.
- E Sep. 01^d11^h37^m 41½ N, 20 E,—. Albania. 2 killed, 34 injured and extensive property damage.
M=6½ (Pra), 6¼~½ (Mat), 6.4 (Buc), 6¼ (Mos), 6.2 (OBM), 5.9 (Upp, Kir).
- Oct. 01^d04^h35^m 34 N, 121 W,—. Off coast of southern Calif., USA. M=4.8 (Pas). Slight
damage in Santa Barbara area.
- D Oct. 25^d15^h57^m 39 N, 42 E,—. Eastern Turkey. 12 killed, many injured and extensive prop-
erty damage at Hinis and Varto. Felt at Ezurum. (BCIS): 18 morts, nombreux blessés,
M=6.2 (Kir, Upp), 5½ (Mat), 5 (Mos).
- Nov. 07^d02^h32^m 36½ N, 2½ E,—. Near coast of Algeria. Several injured. Light damage at
Eou-medfa. M=5½~5¾ (Mat).
- Nov. 08^d13^h54^m (JMA-SB): 43.8 N, 140.6 E, 0~10 km. Off Hokkaido, Japan. Minor damage.
M_J=6.2.
- Nov. 15^d17^h08^m 37½N, 20½ E,—. Near west coast of Greece. M=6½~6¾. Slight damage.
Felt in Greece and Italy. Several injured at Agrinion, Greece.
- Nov. 19^d11^h08^m 5½ S, 146 E, 100 km. Near north coast of New Guinea. M=7. Slight damage
at Lae and Madang.
- Dec. 23^d09^h28^m 38 N, 14½ E,—. Near north coast of Sicily. Minor damage at Catania and
Palermo.

1960 (from CGS-SB)

- ? Jan. 13^h15^h40^m 16 S, 72 W, 200 km. Southern Peru. M=7½ (Pas). Many casualties and

Class, Origin time (GMT), Location of Epicenter and Remarks

- extensive property damage at Arequipa.
(BCIS): Nobreux morts et importants dégâts à Arequipa. Ressenti également à La Paz (d' apres La Paz).
- Jan. 15^d09^h30^m 15 S, 75 W, 150 km. Near coast of southern Peru. M=7 (Pas). 4 injured and minor damage in Ica Province. Felt in Lima area.
- Jan. 20^d03^h25^m 36 N, 122 W,—. Near coast of central Calif., USA. M=5(Pas). Minor damage near Hollister.
- Feb. 09^d23^h55^m 4 S, 128 E,—. Ceram. M=6½~6¾(Pas). Slight damage in Ambon.
- D Feb. 21^d08^h13^m 36 N, 4½ E,—. Northern Algeria. 47 killed, 21 injured and 500 homes destroyed at Beni-Ilman and Melouza. (BCIS): Séismo destructeur, 47 morts, 88 blessés…… M=5.9(Lwi), 5¾ (Mat), 5 (CLL), m=5.6 (Kew).
- Feb. 23^d07^h34^m 39 N, 20 E,—. Greece. 25 houses destroyed and 37 damaged in the region of Preveza. Felt over an area of 60,000m². M=5.4 (CLL), 5½ (Pra, Ath), 4.7 (Lwi), m=5¾ (Kew).
- A Feb. 29^d23^h40^m 30 N, 9 W,—. Morocco. M=6.4 (Pas). 10,000 dead, 25,000 injured. Major property damage at Agadir. (BCIS): Environ 10,000 morts; destruction à 100 % dans les quartiers de la ville d' Agadir situés……M=6¼ (Que), 5¾~6 (Str, Rom), 5¾ (Mos), 5.7 (Kew), 5.6 (Zag), 5½(CLl), 5.4 (Lwo); m=6.1 (Kew).
- E Mar. 09^d23^h54^m 16 S, 72 W, 150 km. Southern Peru. 1.killd, several injured at Arequipa. M=6.3 (Tac), 6~6¼ (Mat).
- E Mar. 12^d11^h54^m 42 N, 21 E,—. Southern Yugoslavia. 1 killed, several injured at Dobi Doland Tetova. M=5¾~6 (Ath), 5½(Que, Pra, Pru).
- T Mar. 20^d17^h07^m (JMA-SB) : 39.8 N, 143.5 E, 20 km. Off northeast coast of Honshu, Japan. Slight damage. Tsunami: 81 cm at Hachinohe. M_J=7.5, M=7 (Pas).
- T Mar. 23^d00^h23^m (JMA-SB) : 39.3 N, 143.8 E, 20 km. Off Honshu, Japan. Tsunami: 29.cm at Ayukawa. 16 cm at Hachinohe.
- Mar. 23^d23^h08^m 46½N, 8 E,—. Switzerland. Minor damage at Brigue and Sierre. Felt in France and Italy. M=2¼ (CLL), 4.6 (Pra).
- Apr. 02^d22^h36^m 36 N, 50 E,—. Western Iran. Damage at Asadabad and Molayer. Felt at Hamadan, Kermansha and Toysarkan.
- E Apr. 13^d12^h37^m 15½ N, 92½ W,—. Guatemala-Mexico border. M=6 (Pas). 1 killed, 14 injured.
- C Apr. 24^d12^h14^m 28 N, 54½ E,—. Southern Iran. 500 dead, many injured and major property damage at Gerash and Lar. (BCIS): 450 morts, 2,000 blessés; importants dégâts à Lar, limités à trois bandes étroites, dégâts à Kourdeh; légers dégâts a Latifi, Khur, Beraq, Gerash. M=7~7¼ (Que), 6¼ (Mat), 6.2 (Lwi), 6 (Mos). 5½~6 (Jer), 5¼ (CLL), m=6.1 (Kew).
- ? May 21^d10^h02^m 37½ S, 73½ W,—. Near coast of Chile. Several injured and moderate property damage at Concepcion and surrounding area. (BCIS): Nombres morts et importants dégâts matériels à Concepcion et environs……M=8.5 (Mat, Buc, Pra), 8¼ (Ath), 8 (Mos),……7¼ (Pas), 7:3 (Tac), m=7.6 (Kew).
- B,T May 22^d19^h11^m 39½S, 74½W,—. Near coast of Chile. More than 2,000 killed, 3,000 injured and \$ 550 million damage in Chile; Seismic sea wave caused 56 deaths, \$ 75

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- million damage in Hawaii; \$ 500 thousand damage to west coast of the United States. (QJS): 119 dead, 20 missing, 872 injured in Japan. $M=8\frac{3}{4}$ (Mat., STL), $8\frac{1}{2}$ (Ath, Brk.), 8.4 (Mos), 8.3 (Pas, Lwi, Tac), $m=8.1$ (Kew).
- (BCIS): Choc principal d' nue séric de séismes destructeurs; dégâts considérables au Chili entre les latitudes 37°S et 40°S ; destructions importantes en particulier à Concepcion, Valdivia, Puerto Monte; grands éboulements sur les contreforts de la Cordillère des Andes au voisinage des lacs Rinihue, Rupanco, Puyehue, Neltume, etc……; pertes humaines comprises entre 6,000 et 10,000 personnes; 2 millions de personnes sans abri, dégâts évalués à 300 millions de dollars; affaissements et soulèvements de la cête; raz de marée destructeurs du Chili, aux Iles Hawaii et à Hokkaido.
- E May. 26^d05^h10^m 40N, 20E,—. Albania-Greece border. 8 killed, 100 injured, 500 houses heavily damage and 580 more suffered lighter damage centering around Korce. (BCIS): 9 morts, une centaine de blessés. $M=6\frac{1}{2}$ (Pas), 6.1 (Kew).
- Jul. 13^d13^h01^m 41N, $23\frac{1}{2}$ E,—. Greece. Minor damage on Chalcidice Peninsula.
- T Jul. 29^d17^h31^m (JMA-SB): 40.2 N, 142.6 E, 30 km. Off Honshu, Japan. Tsunami: 10 cm at Miyako. $M_J=6.7$, $M=6\frac{3}{4}$ (Pas), $6\frac{3}{4}\sim 7$ (Brk).
- D Jul. 30^d02^h04^m $1\frac{1}{2}$ S, 79W,—. Ecuador. 11 killed and minor property damage in Ambato area.
- Aug. 13^d14^h14^m 40.0 S, 74.9 W, 56 km. Near coast of Chile. Slight damage at Valdivia. $M=6\frac{3}{4}\sim 7$ (Pas).
- Aug. 27^d15^h58^m 28.6N, 76.7 E, 58 km. India. 50 injured and minor property damage at New Delli.
- Sep. 21^d03^h44^m 10.4 N, 88.6 W, 60 km. Off coast of El Salvador. Slight damage at San Salvador.
- Sep. 22^d05^h38^m 3.4 S, 29.1 E, 29 km. Congo. Damage at Usumbura and Uvira. $M=5\frac{1}{2}\sim 5\frac{3}{4}$ (Pal).
- Oct. 11^d08^h05^m 38.3N, 107.6 W, 49 km. Western Colorado. Slight damage. $M=5\frac{1}{2}$ (Brk), $4\frac{3}{4}\sim 5$ (Pal).
- Oct. 29^d00^h08^m 44.2 N, 11.5 E, 45 km. Italy. Slight damage at Scarperia.
- Nov. 01^d08^h45^m 38.5 S, 75.1 W, 55 km. Near coast of Chile. Slight damage at Lebu, Concepcion, and Valdivia.
- Nov. 05^d20^h20^m 39.4 N, 20.5 E, 49 km. Northern Greece. Damage in Epirus region. $M=5.0$ (Pal).
- Nov. 11^d05^h31^m 39.3 N, 20.8 E, 43km. Northern Greece. Damage in Epirus region.
- Nov. 11^d06^h53^m 16.1 S, 71.9W, 114 km. Southern Peru. Slight damage at Arequipa.
- D,T Nov. 20^d22^h01^m 6.8S, 81.0W, 55km. Near coast of Peru. About 11 killed and extensive property damage from seismic sea wave at Pimentel, Eten and Santa Rosa. $M=6\frac{3}{4}$ (Pas).
- 1961** (from CGS-SB)
- T Jan. 16^d07^h20^m (JMA-SB): $36^{\circ}02'N$, $142^{\circ}16'E$, 40 km. Off Honshu, Japan. Tsunami: 42 cm at Onahama.
- T Jan. 16^d12^h12^m (JMA-SB): $36^{\circ}13'N$, $141^{\circ}59'E$, 20km. Off Honshu, Japan. Tsunami: 36 cm at Onahama.

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- E Feb. 01^d18^h39^m (QJS): 37°21'N, 138°49'E, 0~5 km. Near west coast of Honshu, Japan. 5 killed, 30 injured, 254 houses destroyed and extensive property damage at Nagaoka. $M_J=5.2$, $M=5\sim5\frac{1}{4}$ (Mat).
- E,T Feb. 26^d18^h11^m (QJS): 31°36'N, 131°51'E, 40 km. Near coast of Kyushu, Japan. 2 killed, 7 injured, and extensive property damage at Miyazaki. Tsunami: 34 cm at Aburatsu. $M_J=7.0$, $M=7\sim7\frac{1}{4}$ (Pas).
- Feb. 27^d15^h44^m 9.7 N, 84.0 W, 85 km. Near coast of Costa Rica. Minor damage at San Jose.
- ? Mar. 16^d13^h45^m 8.2 S, 122.0 E, 74km. Flores Sea. $M=6\frac{1}{4}$ (Pas). Some casualties and major property damage at Ende.
- Apr. 08^d04^h22^m 2.2 S, 79.2 W, 25 km. Ecuador. Several injured and extensive property damage in southern Chimborazo Province.
- Apr. 09^d07^h23^m 36.7 N, 121.4 W, 33 km. San Benito County, Calif., USA. $M=5.5$ (Pas). Moderate property damage at near Hollister.
- Apr. 12^d22^h20^m 13.2 N, 88.9 W, 122 km. El Salvador. $M=5\frac{3}{4}\sim6$ (Pas). Minor damage at San Salvador and southern El Salvador.
- Apr. 16^d05^h02^m 39.3 N, 111.5 W, 35 km. Central Utah, USA. Felt in Sanpete County, Utah. Minor damage at Mt. Pleasant.
- May 14^d00^h12^m 39.8 S, 176.8 E, 40 km. North Island, New Zealand. $M=5.2$ (Wel), 5.4 (Rox). Minor damage on North Island.
- May 21^d21^h40^m 34.5 S, 150.4 E, 27 km. New South Wales, Australia. Minor damage at Bowral and Robertson.
- May 23^d02^h45^m 36.6 N, 28.3 E, 49 km Dodecanese Islands. $M=6\frac{1}{4}$ (Pas). Moderate property damage in Rhodes area and at Marmaris, Turkey.
- Jun. 01^d23^h29^m 10.4N, 39.9E, 33km. Ethiopia. $M=6\frac{1}{2}\sim6\frac{3}{4}$ (Pas). Considerable damage at Kara-Kore. Felt at Addis Ababa.
- Jun. 11^d05^h10^m 27.9N, 54.6E, 37 km. Southern Iran. $M=6\frac{1}{2}\sim6\frac{3}{4}$ (Pas). Major property damage; many casualties in Lar area.
- Jun. 21^d16^h04^m 37.9N, 28.7E, 31km. Western Turkey. Slight damage at Sarakoy.
- Jun. 22^d00^h56^m 42.4 N, 19.3 E, 30 km. Northern Albania-Yugoslavia border. Slight damage at Titograd.
- T Jul. 18^d14^h04^m (JMA-SB): 30.2 N, 131.9 E, 20 km. Off southern coast of Kyushu, Japan. Tsunami: 12 cm at Nase. $M_J=6.6$, $M=6\frac{1}{2}\sim7$ (Pas).
- T Jul. 23^d21^h51^m 18.5 S, 168.3 E, 44 km. New Hebrides Islands. Slight damage at Port Vila. Tidal wave at Port vila and Forari.
- T Aug. 11^d15^h51^m (JMA-SB): 42.5 N, 145.0 E, 40 km. Eastern Hokkaido, Japan. Slight tsunami: 14cm at Hanasaki. Minor damage. $M=7$ (Pas).
- Aug. 19^d04^h56^m 44.7N, 122.5 W, 33 km. Northwestern Oregon, USA. $M=4.5$ (Pas). Minor damage at Albany and Lebanon.
- E Aug. 19^d05^h33^m (QJS): 36°01'N, 136°46'E, 0 km. Near coast of Honshu, Japan. 7 killed, 43 injured and moderate property damage at Fukui, Gifu and Ishikawa. $M_J=7.0$, $M=7\frac{1}{4}$ (Pas).
- Sep. 05^d01^h16^m 38.5 N, 23.6 E, 33 km. Near east coast of Greece. Slight damage at Chalkis, Euboea Island. Felt in eastern Greece.

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- Sep. 15^d01^h46^m 34.9 N, 33.8 E, 36 km. Cypros. Slight damage on Cypros. Felt at Mersin, Turkey, Beyrouth, Lebanon, northern Israel and Syria.
- Sep. 17^d15^h55^m 46.0 N, 122.0W, 33 km. Skamania County, Washington, USA. Slight damage at Stevenson and North Bonneville, Washington and northwestern Oregon.
- Sep. 23^d03^h01^m 19.6N, 155.2 W, 33 km. Hawaii Is., Hawaii: Slight damage at Hilo.
- Sep. 25^d05^h28^m 19.8 N, 155.2 W, 33 km. Hawaii Is., Hawaii. $M=5\frac{3}{4}\sim 6$ (Pas). Minor damage at Hilo.
- Oct. 02^d07^h21^m 36.7 N, 21.9 E, 33 km. Near coast of Greece. Moderate damage in southwestern Peloponnisos.
- Oct. 04^d02^h21^m 33.8 N, 117.8W, 18 km. Orange County, Calif., USA. $M=4.1$ (Pas). Slight damage.
- Oct. 18^d16^h51^m 36.7 S, 73.0 W, 33 km. Near coast of southern Chile. $M=6\frac{1}{2}$ (Pas). Minor damage in area between Curico and Valdivia.
- Oct. 19^d05^h09^m 35.8 N, 117.9 W, 22km. Kern County, Calif., USA. $M=5.2$ (Pas). Slight damage at Mojave.
- Oct. 20^d19^h49^m 33.6 N, 118.0 W, 17 km. Orange County, Calif., USA. $M=4.3$ (Pas), Minor damage at Anaheim, Gardon Grove and Santa Ana.
- Nov. 07^d01^h29^m 45.7 N, 122.4 W, 33 km. Western Oregon-Washington border. Minor damage in Portland, Oregon area.
- Nov. 15^d07^h17^m (JMA-SB): 42.7 N, 145.3, 40 km. Off Hokkaido, Japan. 2 injured etc. $M_j=6.9$.
- Dec. 11^d04^h48^m 19.7N, 99.1 W, 33 km: Central Mexico. Minor damage in Mexico City.
- D Dec. 20^d13^h25^m 4.6N, 75.6W, 176 km. West-central Colombia. $M=6\frac{3}{4}$ (Pas). 23 killed, 100 injured and moderate property damage in Caldas Province. Felt at Balboa Heights, C.Z.

1962 (from CGS-EC)

- E Jan. 07^d10^h03^m 43.3N, 17.1 E, 33 km. Yugoslavia. 2 killed, 19 injured. Moderate damage at Makarska.
- E Jan. 08^d01^h00^m 18.4 N, 70.4W, 32 km. Dominican Republic. $M=6\frac{1}{2}$ (Pas). 1 killed, 6 injured. Damage at San Jose de Ocoa and Azua.
- E Jan. 11^d05^h05^m 43.3 N, 17.1 E, 33 km. Yugoslavia. $M=5\frac{3}{4}$ (Pas). 4 killed, 20 injured. Moderate damage at Podgora, Ploce and Makarska.
- Jan. 21^d02^h51^m 43.0 N, 16.9 E, 33 km. Yugoslavia. Slight damage at Makarska.
- Feb. 14^d06^h36^m 37.8 S, 72.5W, 45 km. Near coast of Chile. $M=7\frac{1}{4}$ (Pas). Moderate property damage in Central Chile.
- D Mar. 18^d15^h30^m 40.9 N, 19.5 E, 33 km. Near coast of southern Albania. 15 killed, 154 injured, moderate damage in Tepolene region. Felt: Italy, Yugoslavia, and Greece.
- E Mar. 18^d20^h18^m 23.8 N, 114.6 E, 25 km. Kwangtung Province, China. 1 killed, 2 injured in Canton. Felt Hong Kong and Macas with minor damage.
- E Apr. 01^d00^h45^m 33.6 N, 59.0 E, 33 km. East Iran. 2 killed and 3 injured at Tajkough and Mousavieh.
- Apr. 10^d12^h34^m 37.3 S, 72.6 W, 67 km. Near coast of southern Chile. Slight damage.
- Apr. 10^d14^h30^m 44.1 N, 73.1 W, 25 km. Western Vermont. Felt in 3 stations. Slight damage

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at Montpelier.

- T Apr. 12^d00^b53^m (JMA-SB) : 37.9 N, 142.8 E, 40 km. Off Honshu, Japan. Tsunami: 55cm at Ayukawa, 20 cm at Hachinohe, 100 cm at Onagawa. $M_J=6.8$.
- Apr. 20^d05^b47^m 20.6 N, 72.2 W, 25km. Near north coast of Haiti. Minor damage at Port-au-Prince. Felt: San Juan, Puerto Rico. $M=6\frac{1}{2}\sim 6\frac{3}{4}$ (Pas), $6\frac{3}{4}\sim 7$ (Brk), 6 (Pal).
- Apr. 23^d05^b58^m (JMA-SB): 42°28'N, 143°49'E, 70 km. Off Hokkaido, Japan. 2 injured etc. $M_J=7.0$, $M=7\sim 7\frac{1}{4}$ (Pas).
- E Apr. 30^d02^b26^m (QJS): 38°44'N, 141°06'E, 10 km. Northeastern Honshu, Japan. 3 killed, 276 injured, 340 houses destroyed etc. $M_J=6.5$, $M=6\frac{1}{2}\sim 6\frac{3}{4}$ (Pas).
- E,T May 11^d14^b11^m 17.0 N, 99.7 W, 25 km. Near coast of Mexico. 4 dead, many injured and extensive property damage in south central Mexico. seismic sea wave, with Maximum amplitude about $2\frac{1}{2}$ feet was reported at Acapulco. $M=7$ (Pas), $7\sim 7\frac{1}{2}$ (Brk).
- E May 19^d14^b58^m 17.2 N, 99.5 W, 20 km. Near coast of Mexico. 3 dead, 16 injured and extensive property damage in south central Mexico. $M=7\sim 7\frac{1}{4}$ (Pas).
- Jun. 11^d07^b15^m 43.5 N, 18.3 E, 21 km. Yugoslavia. 10 injured, extensive property damage at Sarajevo. Felt along Adriatic coast to Trieste. $M=5\sim 5\frac{1}{4}$ (Pal).
- Jun. 28^d04^b27^m 20.0 N, 155.6 W, 25 km. Hawaii Is., Hawaii. Slight damage on Hawaii. $M=5\frac{3}{4}$ (Brk), $5\frac{1}{4}\sim 5\frac{1}{2}$ (Pal).
- Jul. 06^b23^b05^m 36.6 N, 70.4 E, 203 km. Hindu Kush. Felt: Afghanistan, Pakistan, Tadzhik SSR. Minor damage.
- D Jul. 30^d20^b18^m 5.0 N, 76.3 W, 45 km. Western Colombia. 47 killed, 300 injured in Caldas Prov.; property damage over 400,000 square mile area. Felt at Balboa Hights, C. Z. $M=6\frac{3}{4}$ (Pas), $6\frac{3}{4}$ (Brk), 6 (pal).
- D Aug. 21^d18^b19^m 41.4 N, 15.5 E, 34 km. Italy. About 15 dead, 200 injured, major property damage at Naples.
- Aug. 30^d13^b35^m 41.9 N, 111.4 W, 33 km. Utah-Idaho border. Minor damage in Logan, Utah area. Felt in 4 stations. $M=5\frac{3}{4}\sim 6$ (Pas), 5.8 (Pal).
- A Sep. 01^d19^b20^m 35.6 N, 50.0 E, 21 km. Northwest Iran. Over 10,000 killed, many injured and extensive property damage. $M=7\frac{1}{4}$ (Pas), $7\frac{3}{4}$ (Brk), 7 (Pal).
- E Sep. 28^d10^b59^m 38.0 N, 23.1 E, 120 km. Greece. 1 killed, 11 injured and moderate property damage. Felt: Southern Italy, Sicily, Crata, Malta, Southern Yugoslavia. $M=6\frac{3}{4}$ (Pas).
- Oct. 29^d02^b42^m 34.3 N, 117.0 W, 33 km. San Bernardino County, Calif., USA. Slight damage near Big Bear. $M=4\frac{3}{4}\sim 5$ (Pas).
- Nov. 16^d06^b39^m 1.0 S, 78.6 W, 33 km. Ecuador. Slight damage at Ambato.

1963 (from CGS-EC)

- C Feb. 21^d17^b14^m 32.7 N, 20.9 E, 33 km. Near coast of Libya. 300 ~ 500 estimated dead, 500 injured, 12,000 homeless at El Marj. $M=5.0$ (CGS).
- Feb. 14^d13^b18^m 44.5 N, 15.5 E, 36 km. Near coast of Yugoslavia. Slight damage at Zadar. $M=5.4$ (CGS).
- Mar. 03^d17^b30^m 36.7 N, 90.1 W, 18 km. Slight damage southeast Missouri, felt in six states. $M=4\frac{1}{2}$ (Pal), 4.5 (CGS).
- Mar. 26^d21^b34^m 36.0 N, 135.7 E, 33 km. Near east coast of Honshu, Japan. Minor damage

Class, Origin time (GMT), Location of Epicenter and Remarks

- in central Honshu. $M=6\frac{1}{2}$ (Pas), $6\frac{1}{2}$ (Brk), $6\sim6\frac{1}{4}$ (Pal), 5.9 (CGS).
- Mar. 28^d00^h15^m 66.3 N, 19.6 W, 15 km. Iceland. Slight damage and several injured in northern Iceland. $M=7\sim7\frac{1}{4}$ (Pas), $6\frac{1}{2}$ (Brk), $6\frac{1}{2}\sim6\frac{3}{4}$ (Pal).
- E Mar. 31^d02^h27^m 36.9 N, 57.7 E, 33 km. Northeastern Iran. 4 killed, 2 injured and widespread damage. $M=4.6$ (CGS).
- Apr. 12^d08^h41^m 39.0 S, 176.6 W, 106 km. North Island, New Zealand. Minor damage in central North Island.
- Apr. 19^d06^h19^m 31.6 N, 115.7 W, 14 km. Baja Calif., USA. Slight damage Imperial Beach, Calif., USA.
- Apr. 25^d13^h36^m 45.2 N, 5.9 E, 33 km. Southeastern France. Slight damage at Monestier-de-Clerment, La Motte d'Aveillans, Nantes-en-Rattier.
- May 23^d15^h53^m 32.5 N, 115.3 W, 14 km. Baha Calif., Norte. Minor damage at Westmorland, Brawley and El Centro. $M=4.8$ (Pas).
- Jun. 03^d11^h31^m 5.3 N, 72.9 W, 21 km. Colombia. Slight damage in Central Colombia. $M=5$ (Pal, CGS).
- B Jul. 26^d04^h17^m 42.1 N, 21.5 E, 33 km. Southern Yugoslavia. Estimated 2,000 killed and 3,000~4,000 injured at Skopje; 80% of buildings destroyed and 5~10% additional buildings damaged. Yugoslavia Government: 1,005 killed, 3,383 injured etc. $M=5\frac{1}{2}\sim5\frac{3}{4}$ (Brk), $5\frac{1}{2}$ (Pal), 5.4 SD 0.3 (CGS).
- D Sep. 02^d01^h34^m 33.9 N, 74.7 E, 44 km. Northern India. 79 killed, 400 injured and major property damage in Kashmir. $M=5.1$ (CGS).
- Sep. 04^d05^h06^m 36.1 N, 5.3 E, 38 km. Near coast of Algeria. Slight damage at Bir Hadada. $M=5.2$ SD 0.3 (CGS).
- Sep. 11^d02^h08^m 44.3 N, 114.7 W, 15 km. Central Idaho. Slight damage at Redfish Lake. Felt: Boise and Sawtooth Balley area. $M=4.9$ SD 0.4 (CGS).
- Sep. 17^d05^h54^m 10.6 S, 78.2 W, 61 km. Central Peru. Slight damage at Huaraz. $M=6\frac{3}{4}$ (Pas), 5.5 SD 0.3 (CGS).
- E Sep. 18^d16^h58^m 40.9 N, 29.2 E, 33 km. Turkey. 1 killed and several injured at Istanbul. $M=6\frac{1}{4}$ (Pas), $5\frac{3}{4}\sim6$ (Pal), 5.2 SD 0.3 (CGS).
- T Oct. 13^d05^h17^m 44.8 N, 149.5 E, 60 km. Kurile Islands. Felt: Hokkaido and Honshu, Japan. Light damage to USA ship General Hugh J. Gaffey positioned at 44°21'N., 152°01'E. Seismic sea waves: 4.0 ft. Hokkaido; 2.5 Ft. Oahu, Hawaii; 2.2 ft. Crescent City, Calif., 1.5 ft. Attu, Aleutians. $M=8\frac{1}{4}$ (Pas), $7\frac{3}{4}\sim8$ (Pal).
- Oct. 16^d15^h31^m 42.4 N, 70.7 W, 25km. Near coast of Massachusetts. Slight damage at Somerville. $M=4.2$ (Pal).
- T Oct. 20^d00^h53^m 44.7 N, 150.7 E, 25 km. Kurile Islands. Seismic Sea waves: 2.0 ft. Midway Islands; 1.0 ft. La Jolla. California; 0.5 ft. Oahu, Hawaii. $M=6\frac{3}{4}\sim7$ (Pas), $7\frac{1}{4}\sim7\frac{1}{2}$ (Pal).
- Nov. 04^d01^h17^m 6.8 S, 129.6 E, 80 km. Banda Sea. Slight damage at Darwin; Felt throughout Australia, northern Tasmania and Papua.
- Dec. 02^d06^h49^m 47.9 N, 16.5 E, 43 km. Austria. Slight damage at Wiener-Neustadt and Bratislava. $M=4.5$ SD 0.2 (CGS).
- Dec. 04^d21^h32^m 43.6 N, 71.6 W, 33 km. New Hampshire. Slight damage at Laconia. $M=3.7$

Class, Origin (GMT), Location of Epicenter and Remarks

(CGS).

Dec. 22^d13^h35^m 34.9 S, 173.9 E, 82 km. North Island, New Zealand. Moderate damage at Auckland.