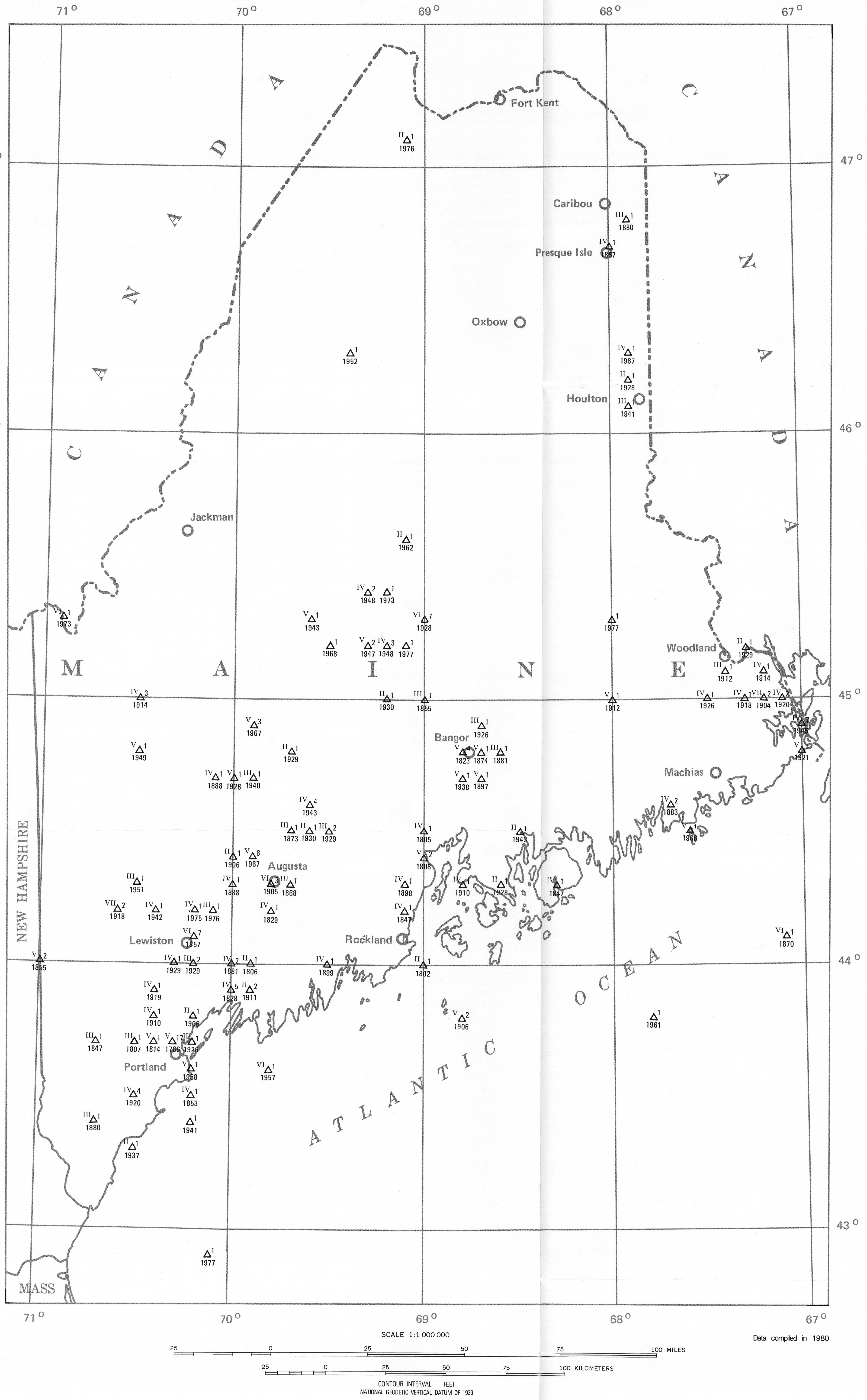
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1284
SEISMICITY, MAINE



SEISMICITY MAP OF THE STATE OF MAINE

By

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INTRODUCTION

The earthquake data shown on this map and listed in table 1 are a list of earthquakes that were originally used in preparing the Seismic Risk Studies in the United States (Algermissen, 1969) which have been recompiled and updated through 1977. These data have been reexamined which resulted in some revisions of epicenters and intensities as well as assignment of intensities to earthquakes that previously had none assigned. Intensity values were updated from new and additional data sources that were not available at the time of original compilation. Some epicenters were relocated on the basis of new information. The data shown in table 1 are estimates of the most accurate epicenter, magnitude, and intensity of each earthquake, on the basis of historical and current information. Some of the aftershocks from large earthquakes are listed but are incomplete in many instances, especially for ones that occurred before seismic instruments were in universal usage. Only earthquakes located within the borders of the state of Maine are listed. This map superceeds Miscellaneous Field Studies Map MF-845.

The data in table 1 were used to compile the seismicity map. The latitude and longitude were rounded to the nearest tenth of a degree and sorted so that all identical locations were grouped together and counted. A triangle represents the epicenter plotted to a tenth of a degree. The number of earthquakes at each location is shown on the map by the number to the right of the triangle. A Roman numeral to the left of a triangle is the maximum Modified Mercalli intensity (Wood and Neumann, 1931) of all earthquakes located at that geographic position. The absence of an intensity value indicates that no intensities have been assigned to earthquakes at that location. A year shown below a triangle is the latest year for which the maximum intensity was recorded.

EXPLANATION OF THE TABLES

The data are listed chronologically in table 1 in the following categories: date, origin time, N. latitude, W. longitude, depth, hypocenter quality and referenced data sources, magnitude, and intensity (Modified Mercalli) and intensity source references. Table 1 has some basic limitations in terms of the size (magnitude or intensity) of the earthquakes listed. Prior to 1965 all recorded felt earthquakes are listed, after 1965 only felt earthquakes or those with magnitudes above the 2.5-3.0 range are listed; the lower magnitude levels apply mostly to the eastern United States. If no magnitude was computed and the earthquake was felt it was included in the earthquake list. The low magnitude events located in recent years with dense seismograph networks have not been included.

Listed below is an explanation of the symbols and codes used in the tables:

1. Leaders (..) indicate information not available.
2. Latitude and longitude are listed to a hundredth of a degree if they have been published with that degree of accuracy, or greater; however, most historical events have been published only to the nearest degree or tenth of a degree and are therefore listed at this accuracy in table 1. An asterisk (*) to the right of the longitude indicates that the latitude and longitude were not given in the source reference, but were assigned by the compilers of the data file. An (x) to the right of the longitude indicates that the event is an explosion, a suspected explosion, rockburst, or a nontectonic event; these have not been plotted on the map.
3. The letter code in the HYPOCENTER, QUAL column is defined below:
   a. Determination of instrumental hypocenters are estimated to be accurate within the ranges of latitude and longitude listed below; each range is letter coded as indicated:
      - A 0.0°-0.1°
      - B 0.1°-0.2°
      - C 0.2°-0.5°
      - D 0.5°-1.0°
      - E 1.0° or larger
   b. Determination of noninstrumental epicenters from felt data are estimated to be accurate within the ranges of latitude and longitude listed below; each range is letter coded as indicated:
      - F 0.0°-0.5°
      - G 0.5°-1.0°
      - H 1.0°-2.0°
      - I 2.0° or larger
4. The reference identification numbers in the HYPOCENTER, REF and INTENSITY, REF columns indicate the sources of the hypocenter and intensity. They are listed in numerical order in table 2.
5. The magnitudes listed under "USGS" are mb values (Gutenberg and Richter, 1956) published in the Preliminary Determination of Epicenters (PDE) by the National Earthquake Information Service, U. S. Geological Survey and predecessor organizations. Associated with the magnitude values listed under "OTHER" are the source code and type. Type is defined by 1 = ML (Richter, 1958), 2 = mbLg (Nuttli, 1973), 3 = MS (Bath, 1966), 4 = mb (Gutenberg and Richter, 1956), and 5 = mbLg modified. The source codes are listed below:
   - SLM - St. Louis University, St. Louis, Mo.
   - OTT - Earth Physics Branch, Seismological Service of Canada, Ottawa.
   - WES - Weston Observatory, Weston, Ma.
6. An asterisk (*) in the INTENSITY, MM column indicates that the intensity was assigned by the compiler on the basis of the available data at the time the catalog was compiled.

REFERENCES

Algermissen, S. T., 1969, Seismic risk studies in the United States: Fourth World Conference on Earthquake Engineering, Santiago, Chile, January 13-18, 1969, Proceedings, v. 1, p.14-27.
Bath, Markus, 1966, Earthquake energy and magnitude, in v. 7 of Physics and chemistry of the Earth: Oxford and New York, Pergamon Press, p. 115-165.
Gutenberg, B. and Richter, C. F., 1956, Magnitude and energy of earthquakes: Annali di Geofisica, v. 9, no. 1, p. 1-15.
Nuttli, O. W., 1973, Seismic wave attenuation and magnitude relations for eastern North America: Journal of Geophysical Research, v. 78, no. 5, p. 876-885.
Richter, C. F.,1958, Elementary Seismology: San Francisco, Calif., W. H. Freeman and Co., Inc., 768 p.
Wood, H. O., and Neumann, F., 1931, Modified Mercalli Intensity Scale of 1931: Seismological Society of America Bulletin, v. 21, no. 4, p. 277-283.

MODIFIED MERCALLI INTENSITY SCALE OF 1931

I. Not felt - or, except rarely under especially favorable circumstances. Under certain conditions, at and outside the boundary of the area in which a great shock is felt: sometimes birds, animals, reported uneasy or disturbed; sometimes dizziness or nausea experienced; sometimes trees, structures, liquids, bodies of water, may sway--doors may swing, very slowly.

II. Felt indoors by few, especially on upper floors, or by sensitive, or nervous persons. Also, as in grade I, but often more noticeably: sometimes hanging objects may swing, especially when delicately suspended; sometimes trees, structures, liquids, bodies of water, may sway, doors may swing, very slowly; sometimes birds, animals, reported uneasy or disturbed; sometimes dizziness or nausea experienced.

III. Felt indoors by several, motion usually rapid vibration. Sometimes not recognized to be an earthquake at first. Duration estimated in some cases. Vibration like that due to passing of light, or lightly loaded trucks, or heavy trucks some distance away. Hanging objects may swing slightly. Movements may be appreciable on upper levels of tall structures. Rocked standing motor cars slightly.

IV. Felt indoors by many, outdoors by few. Awakened few, especially light sleepers. Frightened no one, unless apprehensive from previous experience. Vibration like that due to passing of heavy or heavily loaded trucks. Sensation like heavy body striking building or falling of heavy objects inside. Rattling of dishes, windows, doors; glassware and crockery clink and clash. Creaking of walls, frame, especially in the upper range of this grade. Hanging objects swung, in numerous instances. Disturbed liquids in open vessels slightly. Rocked standing motor cars noticeably.

V. Felt indoors by practically all, outdoors by many or most: outdoors direction estimated. Awakened many, or most. Frightened few--slight excitement, a few ran outdoors. Buildings trembled throughout. Broke dishes, glassware, to some extent. Cracked windows--in some cases, but not generally. Overturned vases, small or unstable objects, in many instances, with occasional fall. Hanging objects, doors, swing generally or considerably. Knocked pictures against walls, or swung them out of place. Opened, or closed, doors, shutters, abruptly. Pendulum clocks stopped, started or ran fast, or slow. Moved small objects, furnishings, the latter to slight extent. Spilled liquids in small amounts from well-filled open containers. Trees, bushes, shaken slightly.

VI. Felt by all, indoors and outdoors. Frightened many, excitement general, some alarm, many ran outdoors. Awakened all. Persons made to move unsteadily. Trees, bushes, shaken slightly to moderately. Liquid set in strong motion. Small bells rang--church, chapel, school, etc. Damage slight in poorly built buildings. Fall of plaster in small amount. Cracked plaster somewhat, especially fine cracks chimneys in some instances. Broke dishes, glassware, in considerable quantity, also some windows. Fall of knick-knacks, books, pictures. Overturned furniture in many instances. Moved furnishings of moderately heavy kind.

VII. Frightened all--general alarm, all ran outdoors. Some, or many, found it difficult to stand. Noticed by persons driving motor cars. Trees and bushes shaken moderately to strongly. Waves on ponds, lakes, and running water. Water turbid from mud stirred up. Incaving to some extent of sand or gravel stream banks. Rang large church bells, etc. Suspended objects made to quiver. Damage negligible in buildings of good design and construction, slight to moderate in well-built ordinary buildings, considerable in poorly built or badly designed buildings, adobe houses, old walls (especially where laid up without mortar), spires, etc. Cracked chimneys to considerable extent, walls to some extent. Fall of plaster in considerable to large amount, also some stucco. Broke numerous windows, furniture to some extent. Shook down loosened brickwork and tiles. Broke weak chimneys at the roof-line (sometimes damaging roofs). Fall of cornices from towers and high buildings. Dislodged bricks and stones. Overturned heavy furniture, with damage from breaking. Damage considerable to concrete irrigation ditches.

VIII. Fright general--alarm approaches panic. Disturbed persons driving motor cars. Trees shaken strongly--branches, trunks, broken off, especially palm trees. Ejected sand and mud in small amounts. Changes: temporary, permanent; in flow of springs and wells; dry wells renewed flow; in temperature of spring and well waters. Damage slight in structures (brick) built especially to withstand earthquakes. Considerable in ordinary substantial buildings, partial collapse: racked, tumbled down, wooden houses in some cases; threw out panel walls in frame structures, broke off decayed piling. Fall of walls. Cracked, broke, solid stone walls seriously. Wet ground to some extent, also ground on steep slopes. Twisting, fall, of chimneys, columns, monuments, also factory stacks, towers. Moved conspicuously, overturned, very heavy furniture.

IX. Panic general. Cracked ground conspicuously. Damage considerable in (masonry) structures built especially to withstand earthquakes: Threw out of plumb some wood-frame houses built especially to withstand earthquakes; great in substantial (masonry) buildings, some collapse in large part; or wholly shifted frame buildings off foundations, racked frames; serious to reservoirs; underground pipes sometimes broken.

X. Cracked ground, especially when loose and wet, up to widths of several inches; fissures up to a yard in width ran parallel to canal and stream banks. Landslides considerable from river banks and steep coasts. Shifted sand and mud horizontally on beaches and flat land. Changed level of water in wells. Threw water on banks of canals, lakes, rivers, etc. Damage serious to dams, dikes, embankments. Severe to well-built wooden structures and bridges, some destroyed. Developed dangerous cracks in excellent brick walls. Destroyed most masonry and frame structures, also their foundations. Bent railroad rails slightly. Tore apart, or crushed endwise, pipe lines buried in earth. Open cracks and broad wavy folds in cement pavements and asphalt road surfaces.

XI. Disturbances in ground many and widespread, varying with ground material. Broad fissures, earth slumps, and land slips in soft, wet ground. Ejected water in large amounts charged with sand and mud. Caused sea-waves ("tidal" waves) of significant magnitude. Damage severe to wood-frame structures, especially near shock centers. Great to dams, dikes, embankments often for long distances. Few, if any (masonry) structures remained standing. Destroyed large well-built bridges by the wrecking of supporting piers, or pillars. Affected yielding wooden bridges less. Bent railroad rails greatly, and thrust them endwise. Put pipe lines buried in earth completely out of service.

XII. Damage total--practically all works of construction damaged greatly or destroyed. Disturbances in ground great and varied, numerous shearing cracks. Landslides, falls of rock of significant character, slumping of river banks, etc., numerous and extensive. Wrenched loose, tore off, large rock masses. Fault slips in firm rock, with notable horizontal and vertical offset displacements. Water channels, surface and underground, disturbed and modified greatly. Dammed lakes, produced waterfalls, deflected rivers, etc. Waves seen on ground surfaces (actually seen, probably, in some cases). Distorted lines of sight and level. Threw objects upward into the air.

Table 1.--Chronological listing of earthquakes for the State of Maine

DATE YEAR	MONTH	DAY	ORIGIN TIME(UTC) H M S	LAT. (N.)	LONG. (W.)	DEPTH (KM)	HYPOCENTER QUAL	HYPOCENTER REF	MAGNITUDE USGS	MAGNITUDE OTHER	INTENSITY MM	INTENSITY REF
1766	JAN	23	10 00 ..	43.7	70.3	..	I	126	..	.. ..	V	76
1766	JAN	24	.. .. ..	43.7	70.3	..	I	126	..	.. ..	II	126
1769	OCT	19	.. .. ..	43.7	70.3	..	I	126	..	.. ..	IV	76
1769	OCT	19	17 00 ..	43.7	70.3	..	I	126	..	.. ..	IV	76
1775	SEP	08	.. .. ..	44.1	70.2	..	I	126	..	.. ..	II	126
1802	FEB	21	.. .. ..	44.0	69.0	..	I	126	..	.. ..	II	126
1805	FEB	07	.. .. ..	44.3	69.8	..	I	126	..	.. ..	II	126
1805	JUN	12	12 30 ..	44.5	69.0	..	I	76	..	.. ..	IV	76
1806	JUN	13	.. .. ..	44.0	69.9	..	I	126	..	.. ..	II	126
1807	FEB	22	19 00 ..	43.7	70.5	..	I	126	..	.. ..	III	76
1807	MAY	06	18 00 ..	43.5	70.5	..	I	126	..	.. ..	IV	126
1808	JUN	26	07 55 ..	44.4	69.0	..	I	76	..	.. ..	V	78
1814	NOV	29	00 14 ..	43.7	70.4	..	I	76	..	.. ..	V	76
1817	MAY	22	20 00 ..	45.2	69.3	..	H	126	..	.. ..	V	126
1821	MAY	05	12 30 ..	44.8	68.8	..	H	78	..	.. ..	V	78
1823	MAR	07	15 00 ..	43.9	70.0	..	H	126	..	.. ..	IV	76
1823	JUN	11	04 50 ..	44.8	68.8	..	H	78	..	.. ..	V	78
1828	JUL	25	11 00 ..	43.9	70.0	..	H	126	..	.. ..	IV	76
1829	AUG	27	02 00 ..	43.9	70.0	..	H	126	..	.. ..	III	76
1829	AUG	27	02 15 ..	43.9	70.0	..	H	126	..	.. ..	III	76
1829	AUG	28	04 00 ..	44.2	69.8	..	H	126	..	.. ..	IV	76
1847	JAN	20	.. .. ..	44.3	68.3	..	H	76	..	.. ..	IV	76
1847	FEB	02	.. .. ..	44.2	69.1	..	H	126	..	.. ..	IV	76
1847	FEB	19	.. .. ..	44.4	69.0	..	H	126	..	.. ..	III	76
1847	APR	02	02 00 ..	43.7	70.7	..	H	126	..	.. ..	III	76
1850	JUL	20	.. .. ..	43.7	70.3	..	H	126	..	.. ..	III	76
1851	JAN	04	04 30 ..	44.6	69.6	..	H	126	..	.. ..	IV	126
1853	JUN	17	.. .. ..	43.7	70.3	..	H	126	..	.. ..	III	76
1853	JUN	20	.. .. ..	43.7	70.3 *	..	H	76	..	.. ..	III	76
1853	JUL	17	10 30 ..	43.5	70.2	..	H	126	..	.. ..	IV	76
1853	JUL	20	.. .. ..	43.7	70.3	..	H	126	..	.. ..	III	76
1855	JAN	19	16 00 ..	43.7	70.3	..	H	126	..	.. ..	III	76
1855	JAN	20	01 00 ..	43.7	70.3	..	H	126	..	.. ..	III	126
1855	FEB	19	.. .. ..	45.0	69.0	..	H	76	..	.. ..	III	76
1855	FEB	23	10 30 ..	44.6	69.6	..	H	126	..	.. ..	III	76
1857	DEC	08	20 00 ..	46.7	68.0	..	H	126	..	.. ..	IV	126
1857	DEC	23	18 30 ..	44.1	70.2	..	H	76	..	.. ..	VI	78
1857	DEC	28	.. .. ..	44.1	70.2	..	H	76	..	.. ..	IV	76
1868	MAR	01	.. .. ..	44.3	69.7	..	H	126	..	.. ..	III	76
1870	FEB	08	.. .. ..	44.1	67.1	..	H	76	..	.. ..	VI	76
1873	JAN	11	10 00 ..	43.9	70.0	..	H	126	..	.. ..	III	76
1873	FEB	22	12 30 ..	44.9	67.0	..	H	126	..	.. ..	III	76
1873	APR	17	06 00 ..	44.5	69.7	..	H	126	..	.. ..	III	76
1873	NOV	13	.. .. ..	44.8	68.8	..	H	126	..	.. ..	III	76
1874	FEB	12	11 30 ..	43.5	70.5	..	H	126	..	.. ..	II	76
1874	FEB	28	03 40 ..	44.8	68.7	..	H	82	..	.. ..	V	38
1876	JAN	16	05 00 ..	44.5	69.5	..	H	126	..	.. ..	III	76
1876	NOV	20	.. .. ..	44.9	67.0	..	H	126	..	.. ..	II	76
1877	FEB	18	19 20 ..	43.7	70.3	..	H	126	..	.. ..	III	76
1880	MAR	29	.. .. ..	43.4	70.7	..	H	126	..	.. ..	III	76
1880	APR	03	07 00 ..	46.8	67.9	..	H	126	..	.. ..	III	76
1881	JAN	21	02 40 ..	44.0	70.0	..	H	38	..	.. ..	IV	126
1881	FEB	27	03 55 ..	44.3	69.8	..	H	126	..	.. ..	III	76
1881	AUG	01	02 45 ..	44.8	68.6	..	H	126	..	.. ..	III	76
1883	JAN	01	07 58 ..	44.6	67.7	..	H	126	..	.. ..	IV	76
1883	JAN	01	13 28 ..	44.6	67.7	..	H	126	..	.. ..	II	76
1885	MAY	03	14 00 ..	45.2	69.2	..	H	126	..	.. ..	III	76
1888	FEB	01	16 20 ..	44.7	70.1	..	H	126	..	.. ..	IV	76
1888	AUG	15	01 15 ..	44.3	70.0	..	H	126	..	.. ..	IV	126
1897	SEP	25	18 05 ..	44.7	68.7	..	H	78	..	.. ..	V	78
1898	SEP	17	15 54 ..	44.3	69.1	..	H	38	..	.. ..	IV	82
1899	OCT	05	11 30 ..	44.0	69.5	..	H	126	..	.. ..	IV	126
1904	MAR	21	06 04 ..	45.0	67.2	..	G	38	..	.. ..	VII	38
1905	JUL	15	10 10 ..	44.3	69.8	..	G	76	..	.. ..	VI	126
1906	MAR	04	.. .. ..	43.8	70.2	..	H	126	..	.. ..	II	126
1906	MAR	18	.. .. ..	44.4	70.0	..	H	126	..	.. ..	II	126
1906	OCT	19	.. .. ..	43.8	68.8	..	H	76	..	.. ..	III	76
1906	OCT	20	14 00 ..	43.8	68.8	..	G	76	..	.. ..	V	76
1906	OCT	21	.. .. ..	43.7	70.3	..	G	126	..	.. ..	III	76
1907	JUN	29	.. .. ..	43.5	70.5	..	G	126	..	.. ..	IV	84
1908	JAN	15	.. .. ..	43.9	69.9	..	H	126	..	.. ..	II	126
1910	JAN	23	01 30 ..	43.8	70.4	..	G	38	..	.. ..	IV	76
1910	OCT	20	21 50 ..	44.3	68.8	..	G	76	..	.. ..	IV	76
1911	DEC	17	.. .. ..	43.9	69.9	..	H	126	..	.. ..	II	126
1912	MAR	20	12 00 ..	45.1	67.4	..	G	126	..	.. ..	III	76
1912	DEC	11	10 15 ..	45.0	68.0	..	G	76	..	.. ..	V	82
1914	JAN	13	08 00 ..	45.1	67.2	..	G	38	..	.. ..	IV	76
1914	FEB	22	00 15 ..	45.0	70.5	..	G	82	..	.. ..	IV	82
1914	FEB	22	00 20 ..	45.0	70.5	..	G	76	..	.. ..	IV*	217
1914	FEB	22	00 35 ..	45.0	70.5	..	G	76	..	.. ..	III*	217
1918	JAN	14	07 20 ..	45.0	67.3	..	G	76	..	.. ..	IV	76
1918	AUG	21	05 12 ..	44.2	70.6	..	G	38	..	.. ..	VII	76
1918	AUG	21	07 45 ..	44.2	70.6 *	..	G	78	..	.. ..	IV	78
1918	DEC	12	03 30 ..	44.8	68.8	..	G	126	..	.. ..	IV	76
1919	JUL	11	01 40 ..	43.9	70.4	..	G	126	..	.. ..	IV	76
1919	JUL	23	11 50 ..	43.7	70.3	..	G	84	..	.. ..	IV	76
1920	JUN	07	08 00 ..	43.5	70.5	..	G	126	..	.. ..	IV	76
1920	NOV	09	00 40 ..	45.0	67.1	..	G	76	..	.. ..	IV	76
1921	OCT	10	13 00 ..	44.8	67.0	..	G	76	..	.. ..	V	76
1922	SEP	09	06 00 ..	45.0	67.1	..	G	126	..	.. ..	III	76
1925	OCT	18	21 30 ..	44.1	70.2	..	G	126	..	.. ..	IV	76
1926	MAY	15	11 00 ..	43.7	70.2	..	G	126	..	.. ..	III	76
1926	MAY	26	05 00 ..	44.9	68.7	..	G	126	..	.. ..	III	76
1926	AUG	28	21 30 ..	44.7	70.0	..	G	38	..	.. ..	V	38
1926	NOV	24	19 30 ..	45.0	67.5	..	G	76	..	.. ..	IV	76
1928	JAN	21	05 30 ..	45.3	69.0	..	G	77	..	.. ..	IV	77
1928	FEB	08	.. .. ..	45.3	69.0	..	G	1	..	.. ..	VI	38
1928	FEB	09	.. .. ..	45.3	69.0	..	G	77	..	.. ..	IV	77
1928	FEB	17	05 29 ..	45.3	69.0	..	G	77	..	.. ..	III	77
1928	MAR	22	13 30 ..	45.3	69.0	..	G	77	..	.. ..	IV	77
1928	MAR	28	.. .. ..	45.3	69.0	..	G	77	..	.. ..	IV	77
1928	MAR	29	.. .. ..	45.3	69.0	..	G	77	..	.. ..	III	77
1928	AUG	30	09 10 ..	44.3	68.6	..	G	1	..	.. ..	II	77
1928	NOV	20	02 30 ..	45.0	67.2	..	G	1	..	.. ..	IV	77
1928	DEC	12	19 07 ..	44.6	69.6	..	G	1	..	.. ..	II	77
1928	DEC	25	02 00 ..	46.2	67.9	..	G	1	..	.. ..	II	77
1929	FEB	05	19 09 ..	44.0	70.3	..	G	2	..	.. ..	IV	77
1929	MAR	29	00 00 ..	45.2	67.3	..	G	2	..	.. ..	II	77
1929	OCT	08	12 20 ..	44.0	70.2	..	G	2	..	.. ..	III	77
1929	OCT	08	12 30 ..	44.0	70.2	..	G	2	..	.. ..	III*	2
1929	OCT	09	00 30 ..	44.5	69.5	..	G	2	..	.. ..	III	77
1929	DEC	05	15 00 ..	44.8	69.7	..	G	2	..	.. ..	II	77
1930	MAR	11	23 30 ..	44.0	70.0	..	G	3	..	.. ..	II	77
1930	NOV	13	06 00 ..	45.0	69.2	..	G	3	..	.. ..	II*	3
1930	DEC	25	.. .. ..	44.5	69.6	..	G	3	..	.. ..	II*	3
1934	AUG	02	14 59 ..	43.7	70.3	..	G	77	..	.. ..	IV	7
1934	AUG	02	17 50 ..	43.7	70.3	..	G	77	..	.. ..	III	7
1934	AUG	03	02 30 ..	43.7	70.3	..	G	77	..	.. ..	IV	7
1934	AUG	26	11 36 ..	44.9	67.0	..	G	77	..	.. ..	III	7
1935	JAN	15	01 15 ..	44.1	70.2	..	G	77	..	.. ..	II	77
1935	MAR	04	02 40 ..	44.9	67.0	..	G	77	..	.. ..	II	77
1937	OCT	12	11 00 ..	43.3	70.5	..	G	77	..	.. ..	II	77
1938	AUG	22	12 48 13	44.7	68.8	..	C	77	..	4.1OTT 1	V	11
1940	MAR	28	11 42 35	44.7	69.9	..	C	77	..	3.8OTT 1	III*	13
1941	JUL	01	16 59 38	43.4	70.2	..	C	77	..	2.0OTT 1	...	..
1941	AUG	30	10 21 25	46.1	67.9	..	C	77	..	3.7OTT 1	III*	14
1942	MAR	08	23 37 58	44.2	70.4	..	D	77	..	.. ..	IV	77
1943	JAN	14	21 32 38	45.3	69.6	..	C	77	..	5.4OTT 1	V	16
1943	FEB	10	09 45 ..	43.7	70.3	..	F	77	..	.. ..	II	77
1943	JUN	12	.. .. ..	44.5	68.5	..	F	77	..	.. ..	II	77
1943	DEC	19	09 00 44	44.6	69.6	..	F	77	..	.. ..	IV	126
1945	JUL	15	10 44 59	44.9	67.0	..	F	77	..	.. ..	IV	77
1945	AUG	28	01 37 ..	44.9	67.0	..	F	77	..	.. ..	II	77
1945	OCT	23	19 30 ..	44.1	70.2	..	F	77	..	.. ..	II	77
1947	DEC	28	19 58 18	45.2	69.3	..	C	77	..	4.5OTT 1	V	20
1948	JAN	06	20 46 51	45.4	69.3	..	C	77	..	4.0OTT 1	IV	77
1948	JAN	06	21 20 ..	45.4	69.3	..	F	77	..	.. ..	II	126
1948	NOV	21	15 41 ..	44.9	67.0	..	F	77	..	.. ..	III	77
1948	NOV	29	04 56 47	45.2	69.2	..	F	77	..	.. ..	IV	77
1948	NOV	29	11 00 ..	45.2	69.2	..	F	126	..	.. ..	III*	21
1949	OCT	05	02 33 47.5	44.8	70.5	..	C	22	.	4.0OTT 1	V	22
1951	OCT	28	12 58 ..	44.3	70.5	..	G	126	..	.. ..	III	126
1952	FEB	18	20 56 07	46.3	69.4	..	B	77	..	3.3OTT 1	...	..
1957	APR	26	11 40 06	43.6	69.8	..	C	30	..	4.7OTT 1	VI	30
1958	SEP	19	17 45 ..	43.6	70.2	..	F	77	..	.. ..	V	31
1961	DEC	14	01 49 35	43.8	67.8	025	C	221	..	3.9OTT 1	...	..
1962	DEC	01	21 29 23	45.6	69.1	..	D	222	..	3.0OTT 1	II*	222
1966	JUL	24	01 59 58.4	44.5	67.6	..	C	81	..	3.6OTT 1	V	81
1967	APR	28	12 23 31.7	46.3	67.9	..	C	40	..	2.5OTT 1	IV	40
1967	JUL	01	.. .. ..	44.4	69.9	..	C	126	..	2.5OTT 1	...	..
1967	JUL	01	.. .. ..	44.4	69.9	..	G	126	..	2.5OTT 1	...	..
1967	JUL	01	14 09 07	44.9	69.9	..	C	40	..	3.2WES 1	V	40
1967	JUL	01	15 33 32	44.9	69.9	..	C	40	..	3.2WES 1	III	126
1967	JUL	01	15 55 58.2	44.4	69.9	..	C	40	..	3.3WES 1	III	126
1967	JUL	01	16 00 42	44.9	69.9	..	C	40	..	2.9WES 1	III	126
1967	JUL	01	16 05 40.2	44.4	69.9	..	C	40	..	3.8WES 1	V	40
1967	JUL	01	16 11 18.9	44.4	69.9	..	C	40	..	3.5WES 1	III	126
1967	JUL	01	16 19 32.6	44.4	69.9	..	C	40	..	2.9WES 1	...	..
1968	SEP	23	15 38 50	45.2	69.5	..	C	126	..	3.3OTT 2	...	..
1973	MAR	25	01 49 02	45.4	69.2	010	C	218	..	2.8OTT 1	...	..
1973	JUN	15	01 09 04.2	45.32	70.91	012	B	46	4.8	5.2SLM 1	VI	46
1975	OCT	10	04 54 ..	44.2	70.2	..	B	126	..	1.9WES 1	IV	126
1975	OCT	10	10 58 ..	44.1	70.2	..	B	126	..	2.2WES 1	III	126
1976	APR	15	10 36 04.8	44.24	70.14	..	A	85	..	2.4WES 2	III	85
1976	DEC	14	12 23 ..	47.1	69.1	..	B	126	..	.. ..	II	126
1977	JUL	01	15 53 19.5	42.88	70.06	000	B	210	..	2.6WES 2	...	..
1977	OCT	02	05 51 11.6	45.16	69.06	000	B	200	..	2.6WES 2	...	..
1977	NOV	25	05 13 16.2	45.34	68.03	000	B	200	..	2.6WES 2	...	..

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