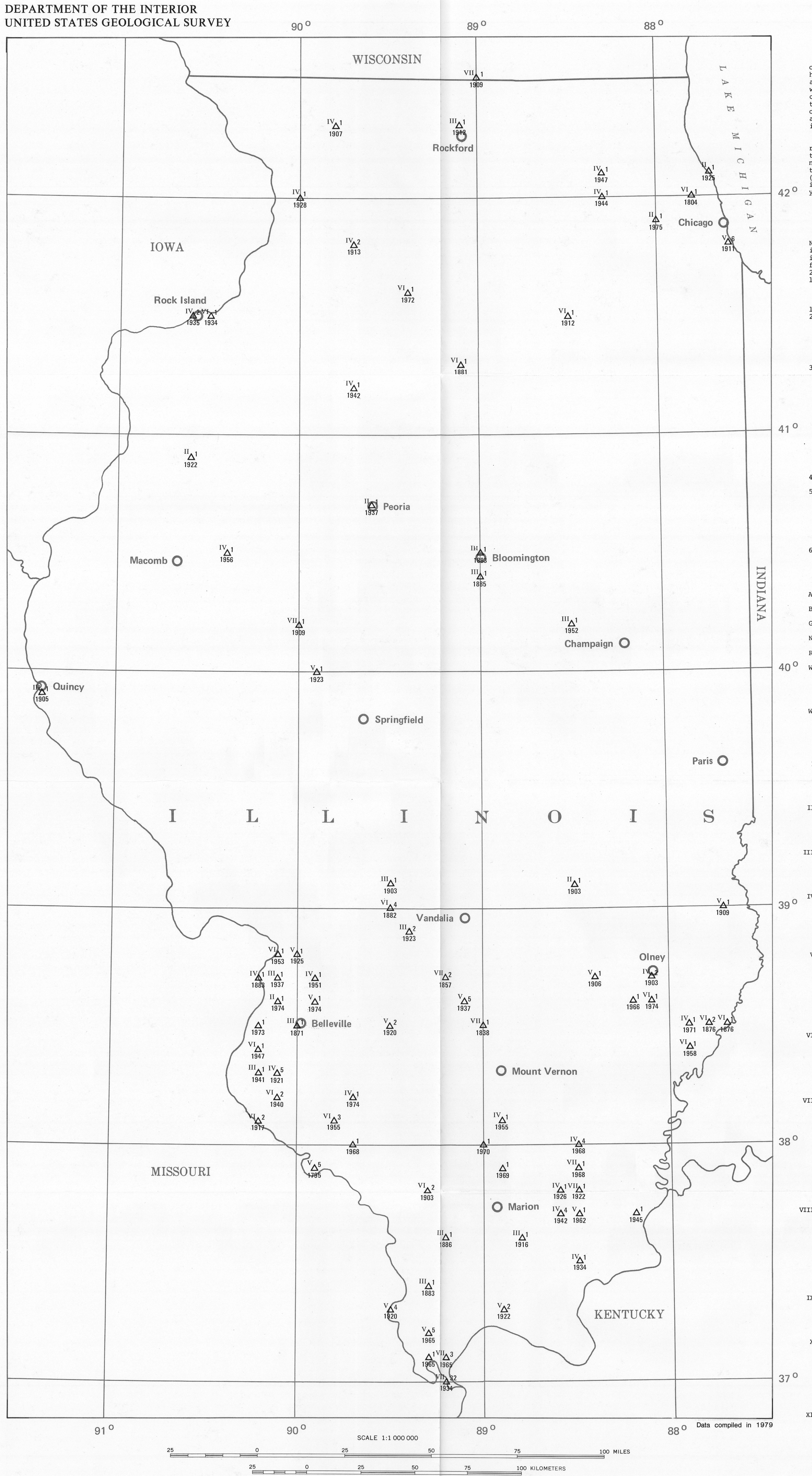
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1143
SEISMICITY MAP, ILLINOIS



SEISMICITY MAP OF THE STATE OF ILLINOIS

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. The data have been reexamined and intensities assigned where none had been assigned before, on the basis of available data. Other 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.

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. 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), and 4 = mb (Gutenberg and Richter, 1956). The source codes are listed below:
   PAL - Lamont-Doherty Geological Observatory, Palisades, N.Y.
   SLM - St. Louis University, St. Louis, Mo.
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.

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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 Illinois

DATE			ORIGIN TIME(UTC)			LAT.	LONG.	DEPTH	HYPOCENTER		MAGNITUDE		INTENSITY	
YEAR	MONTH	DAY	H	M	S	(N.)	(W.)	(KM)	QUAL	REF	USGS	OTHER	MM	REF
1795	JAN	08	09	..	..	37.9	89.9	..	H	105	..	.. ..	V*	105
1804	AUG	20	20	10	..	42.0	87.8	..	G	105	..	.. ..	VI	105
1819	SEP	17	04	..	..	38.1	89.8	..	H	105	..	.. ..	IV	105
1819	SEP	17	..	..	..	38.1	89.8	..	H	105	..	.. ..	IV*	105
1820	NOV	09	22	..	..	37.3	89.5	..	G	38	..	.. ..	V	173
1838	JUN	09	14	45	..	38.5	89.0	..	G	113	..	.. ..	VII*	113
1855	MAY	03	03	33	..	37.0	89.2	..	H	105	..	.. ..	IV	109
1855	MAY	03	10	00	..	37.0	89.2	..	H	105	..	.. ..	III	109
1855	MAY	03	10	05	..	37.0	89.2	..	H	103	..	.. ..	III*	105
1857	OCT	08	10	00	..	38.7	89.2	..	G	113	..	.. ..	VII	109
1857	OCT	08	10	07	..	38.7	89.2 *	..	G	109	..	.. ..	VII	109
1871	JUL	24	..	..	..	37.0	89.2	..	G	105	..	.. ..	III	105
1871	JUL	25	18	40	..	38.5	90.0	..	G	105	..	.. ..	III	109
1872	FEB	08	11	00	..	37.0	89.2	..	G	105	..	.. ..	III	109
1874	JUL	09	22	00	..	37.0	89.2	..	G	105	..	.. ..	IV*	130
1876	SEP	25	06	..	..	38.5	87.8	..	G	105	..	.. ..	VI	105
1876	SEP	25	06	15	..	38.5	87.7	..	G	38	..	.. ..	VI	38
1876	SEP	26	..	..	..	38.5	87.8	..	G	105	..	.. ..	III	105
1877	NOV	19	11	10	..	37.0	89.2	..	G	105	..	.. ..	III*	105
1878	JAN	09	04	30	..	37.0	89.2	..	G	105	..	.. ..	III	109
1878	JAN	09	..	..	..	37.0	89.2 *	..	G	105	..	.. ..	III	109
1878	NOV	19	11	10	..	37.0	89.2	..	G	105	..	.. ..	III	105
1879	JUL	26	17	45	..	37.0	89.2	..	G	105	..	.. ..	III	105
1881	MAY	27	..	..	..	41.3	89.1	..	G	105	..	.. ..	VI	105
1882	SEP	27	10	20	..	39.0	89.5	..	G	113	..	.. ..	VI	38
1882	OCT	15	05	50	..	39.0	89.5	..	G	113	..	.. ..	V	38
1882	OCT	15	06	30	..	39.0	89.5	..	G	105	..	.. ..	V	109
1882	OCT	15	10	35	..	39.0	89.5	..	G	113	..	.. ..	V	109
1882	OCT	22	06	10	..	38.9	89.4	..	G	105	..	.. ..	III	105
1883	JAN	10	20	25	..	37.4	89.3	..	G	105	..	.. ..	III	105
1883	JAN	11	07	12	..	37.0	89.2	..	H	38	..	.. ..	VI	38
1883	FEB	04	11	..	..	40.5	89.0	..	H	168	..	.. ..	III*	168
1883	APR	12	08	30	..	37.0	89.2	..	H	38	..	.. ..	VI	173
1883	JUL	06	17	15	..	37.0	89.2	..	G	105	..	.. ..	III	109
1883	NOV	15	03	14	..	38.7	90.2	..	G	113	..	.. ..	IV	105
1885	DEC	27	01	05	..	40.4	89.0	..	G	105	..	.. ..	III	105
1886	MAR	18	05	59	..	37.6	89.2	..	G	105	..	.. ..	III*	109
1886	MAR	18	17	15	..	37.0	89.2	..	G	105	..	.. ..	IV*	105
1887	AUG	02	18	36	..	37.0	89.2	..	H	38	..	.. ..	V	38
1891	SEP	27	04	55	..	37.0	89.2	..	G	105	..	.. ..	V	109
1899	FEB	09	05	..	..	41.8	87.6	..	H	105	..	.. ..	...	..
1899	FEB	09	06	30	..	41.8	87.6	..	H	105	..	.. ..	...	..
1899	FEB	09	09	..	..	41.8	87.6	..	H	105	..	.. ..	...	..
1899	FEB	09	09	30	..	41.8	87.6	..	H	105	..	.. ..	...	..
1899	FEB	09	12	..	..	41.8	87.6	..	H	105	..	.. ..	...	..
1903	FEB	09	00	21	..	37.8	89.3	..	G	105	..	.. ..	VI	38
1903	MAR	17	11	50	..	39.1	89.5	..	G	105	..	.. ..	III	109
1903	OCT	21	..	..	..	38.7	88.1	..	G	105	..	.. ..	IV	84
1903	NOV	03	18	00	..	37.8	89.3	..	G	105	..	.. ..	III*	109
1903	DEC	11	..	..	..	39.1	88.5	..	H	105	..	.. ..	II	109
1903	DEC	31	11	30	..	40.0	87.9 x	..	H	105	..	.. ..	...	..
1905	AUG	22	10	45	..	39.9	91.4	..	G	105	..	.. ..	III*	113
1906	MAY	21	19	00	..	38.7	88.4	..	G	105	..	.. ..	V	109
1907	JAN	31	05	30	..	38.9	89.5 x	..	G	109	..	.. ..	V	105
1907	NOV	28	16	30	..	42.3	89.8	..	H	84	..	.. ..	IV	84
1908	OCT	28	00	27	..	37.0	89.2	..	H	38	..	.. ..	V	38
1909	MAY	26	14	42	..	42.5	89.0	..	G	38	..	.. ..	VII	38
1909	JUL	19	04	34	..	40.2	90.0	..	G	38	..	.. ..	VII	38
1909	AUG	16	22	45	..	38.3	90.1	..	G	105	..	.. ..	IV	105
1909	OCT	22	22	30	..	41.8	89.7	..	G	105	..	.. ..	IV*	109
1909	OCT	23	09	47	..	39.0	87.7	..	G	38	..	.. ..	V	38
1911	JUL	29	..	..	..	41.8	87.6	..	G	105	..	.. ..	V	84
1912	JAN	02	16	21	..	41.5	88.5	..	G	38	..	.. ..	VI	38
1912	SEP	25	..	..	..	42.3	89.1	..	G	105	..	.. ..	III*	105
1913	OCT	17	02	15	..	41.8	89.7	..	G	105	..	.. ..	IV	84
1915	FEB	05	06	55	..	37.7	88.6	..	G	105	..	.. ..	IV	109
1915	FEB	19	04	35	..	37.1	89.2	..	G	105	..	.. ..	IV	105
1915	APR	15	13	20	..	38.7	88.1	..	G	105	..	.. ..	III*	109
1916	FEB	18	01	27	..	37.6	88.8	..	G	84	..	.. ..	III	84
1916	AUG	24	09	..	..	37.0	89.2	..	G	105	..	.. ..	IV	105
1917	APR	09	20	52	..	33.1	90.2	..	F	113	..	.. ..	VI	38
1917	APR	09	23	35	..	38.1	90.2	..	F	113	..	.. ..	IV	113
1918	FEB	17	08	10	..	37.0	89.2	..	G	105	..	.. ..	III	109
1920	APR	30	15	12	..	38.6	89.1	..	G	105	..	.. ..	IV	105
1920	MAY	01	15	15	..	38.5	89.5	..	G	113	..	.. ..	V	109
1920	MAY	01	16	09	..	38.5	89.5 *	..	H	109	..	.. ..	III*	109
1921	FEB	27	22	16	..	37.0	89.2	..	G	105	..	.. ..	III	109
1921	SEP	09	03	..	..	38.3	90.1	..	G	105	..	.. ..	IV	109
1921	SEP	09	05	45	..	38.3	90.1 *	..	H	109	..	.. ..	III*	109
1921	OCT	01	09	..	..	37.7	88.6	..	G	105	..	.. ..	IV	109
1921	OCT	09	07	50	..	38.3	90.1	..	G	105	..	.. ..	III	109
1921	OCT	09	11	50	..	38.3	90.1	..	G	105	..	.. ..	III	109
1922	MAR	22	22	30	..	37.3	88.9	..	G	105	..	.. ..	V	38
1922	MAR	23	02	20	..	37.3	88.9	..	G	105	..	.. ..	V	109
1922	APR	11	05	..	..	40.9	90.6	..	G	105	..	.. ..	II	109
1922	NOV	27	03	31	..	37.8	88.5	..	G	105	..	.. ..	VII*	109
1923	MAR	09	02	45	..	38.9	89.4	..	G	105	..	.. ..	III	109
1923	MAY	06	07	50	..	37.0	89.2	..	G	105	..	.. ..	III	109
1923	MAY	15	23	42	..	37.0	89.2	..	G	105	..	.. ..	III	109
1923	NOV	10	04	..	..	40.0	89.9	..	H	105	..	.. ..	V	109
1923	NOV	29	23	20	..	37.0	89.2	..	G	105	..	.. ..	IV	105
1925	MAR	03	16	..	..	42.1	87.7	..	G	105	..	.. ..	II	105
1925	JUL	13	..	..	..	38.8	90.0	..	G	105	..	.. ..	V	109
1926	MAR	22	14	30	..	37.8	88.6	..	G	105	..	.. ..	IV	105
1928	JAN	23	09	19	..	42.0	90.0	..	G	1	..	.. ..	IV	1
1930	FEB	25	12	45	..	37.0	89.2	..	G	105	..	.. ..	III	109
1933	JUL	13	14	42	39	37.9	89.9	..	G	105	..	.. ..	III	109
1933	AUG	04	04	34	15	37.9	89.9	..	G	105	..	.. ..	IV	109
1933	OCT	24	..	..	..	37.3	89.5	..	G	105	..	.. ..	III	105
1934	APR	17	13	53	23	37.9	89.9	..	G	105	..	.. ..	III	109
1934	MAY	15	14	28	..	37.9	89.9	..	G	105	..	.. ..	IV*	109
1934	AUG	20	00	47	27	37.0	89.2	..	G	38	..	.. ..	VII	38
1934	AUG	20	03	37	25	37.0	89.2	..	G	7	..	.. ..	III*	7
1934	OCT	30	02	25	47	37.5	88.5	..	F	79	..	.. ..	IV	79
1934	NOV	12	14	45	..	41.5	90.5	..	G	38	..	.. ..	VI	38
1935	JAN	05	18	40	..	41.5	90.6 *	..	G	129	..	.. ..	IV	105
1935	JAN	05	18	45	..	41.5	90.6 *	..	G	129	..	.. ..	III	173
1936	DEC	20	22	41	12	37.3	89.5	..	G	105	..	.. ..	II	109
1937	JUN	29	21	45	..	40.7	89.6	..	G	105	..	.. ..	II	105
1937	AUG	05	23	12	..	38.7	90.1	..	H	105	..	.. ..	III	105
1937	NOV	17	17	04	47.7	38.6	89.1	..	C	80	..	.. ..	V	80
1939	NOV	23	15	14	51.3	38.2	90.1	..	C	117	..	.. ..	V	38
1940	NOV	23	21	15	..	38.2	90.1	..	C	13	..	.. ..	VI	13
1941	NOV	15	20	04	..	38.3	90.2	..	G	105	..	.. ..	III	105
1941	NOV	22	21	55	..	37.3	89.5	..	G	105	..	.. ..	III*	105
1942	MAR	01	14	43	06	41.2	89.7	..	C	15	..	.. ..	IV*	15
1942	MAR	29	12	43	06	37.7	88.6	..	G	105	..	.. ..	IV	105
1942	AUG	31	09	28	..	37.0	89.2	..	G	105	..	.. ..	IV	105
1944	MAR	16	..	..	..	42.0	88.3	..	G	105	..	.. ..	IV	173
1945	JUL	24	09	00	50	37.7	88.2	..	H	105	..	.. ..	...	..
1945	NOV	13	08	21	..	37.0	89.2	..	G	105	..	.. ..	IV	105
1946	FEB	25	00	52	..	38.6	89.1	..	G	105	..	.. ..	IV	19
1947	JAN	16	16	23	..	37.0	89.2	..	G	105	..	.. ..	II*	105
1947	MAR	16	15	30	..	42.1	88.3	..	G	105	..	.. ..	IV	105
1947	JUN	30	04	23	53	38.4	90.2	..	C	20	..	.. ..	VI	38
1948	JAN	06	01	34	..	38.6	89.1	..	G	105	..	.. ..	IV*	105
1951	SEP	20	02	38	43	38.7	89.9	..	G	105	..	.. ..	IV	105
1952	JAN	07	22	21	05	40.2	88.5	..	G	105	..	.. ..	III	105
1953	MAY	06	07	50	..	37.0	89.2	..	G	105	..	.. ..	III	105
1953	MAY	15	23	42	..	37.0	89.2	..	G	105	..	.. ..	III	105
1953	SEP	11	18	26	28	38.8	90.1	..	F	105	..	.. ..	VI	26
1953	DEC	30	22	..	..	38.6	89.1	..	G	105	..	.. ..	IV	26
1955	APR	09	13	01	24	38.1	89.8	..	B	28	..	.. ..	VI	28
1955	APR	11	10	50	..	37.7	88.6	..	G	105	..	.. ..	II	28
1955	MAY	29	..	..	..	38.1	88.9	..	G	105	..	.. ..	IV	28
1956	MAR	13	15	05	..	40.5	90.4	..	H	105	..	.. ..	IV	29
1958	JAN	28	05	56	40	37.1	89.2	..	G	105	..	.. ..	V	31
1958	NOV	08	02	41	43	38.4	87.9	..	B	31	..	.. ..	VI	31
1962	JUN	27	01	28	55.7	37.7	88.5	025	B	35	..	5.4PAL 3	V	35
1965	AUG	14	05	04	30.1	37.1	89.3	005	C	74	..	2.9SLM 2	...	..
1965	AUG	14	05	46	17.4	37.2	89.3	005	C	74	..	3.2SLM 2	IV	173
1965	AUG	14	05	59	27.0	37.2	89.3	..	B	177	..	2.5SLM 2	...	..
1965	AUG	14	13	13	54.1	37.1	89.2	005	C	75	5.0	3.8SLM 2	VII	75
1965	AUG	15	04	19	01	37.2	89.3	..	B	177	..	3.5SLM 2	V	75
1965	AUG	15	06	07	28.0	37.2	89.3	..	B	177	..	3.4SLM 2	V	113
1965	AUG	15	11	19	38.0	37.2	89.3	..	B	177	..	2.7SLM 2	...	..
1966	JUN	22	11	27	53.0	38.6	88.2	000	C	178	..	3.2SLM 2	...	..
1968	MAR	31	17	58	09.0	38.0	89.7	..	A	74	4.5	3.5SLM 2	...	..
1968	NOV	09	17	01	42.0	37.95	88.48	025	A	118	5.3	5.5SLM 2	VII	41
1968	NOV	09	17	08	17.0	38.0	88.5	000	C	178	..	3.8SLM 2	IV	173
1968	NOV	09	18	45	00	38.0	88.5	..	B	119	..	3.0SLM 2	...	..
1968	NOV	09	..	..	..	38.0	88.5	..	B	113	..	3.8SLM 2	...	..
1968	NOV	11	11	04	20	38.0	88.5	..	A	119	..	3.0SLM 4	...	..
1969	FEB	28	13	10	13.1	37.9	88.9	..	A	119	..	3.2SLM 2	...	..
1970	DEC	08	23	16	..	38.0	89.0	..	F	173	..	.. ..	...	..
1971	FEB	12	12	44	27.7	38.52	87.90	012	A	44	..	3.3SLM 2	IV	44
1972	SEP	15	05	22	15.7	41.59	89.42	005	A	45	3.7	4.4SLM 2	VI	45
1973	APR	18	12	21	53.3	38.47	90.20	015	A	74	..	2.5SLM 2	...	..
1974	MAR	27	16	10	56.3	38.55	90.13	010	A	107	..	2.4SLM 2	II	107
1974	APR	03	23	05	02.5	38.59	88.09	011	A	108	4.5	4.7SLM 2	VI	108
1974	JUN	05	08	06	11.3	38.62	89.94	011	A	108	4.0	3.6SLM 2	V	108
1974	AUG	22	22	33	59.6	38.23	89.73	012	A	93	..	2.5SLM 2	IV	47
1975	MAR	01	18	12	..	41.9	88.0 *	..	G	87	..	.. ..	II	87

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