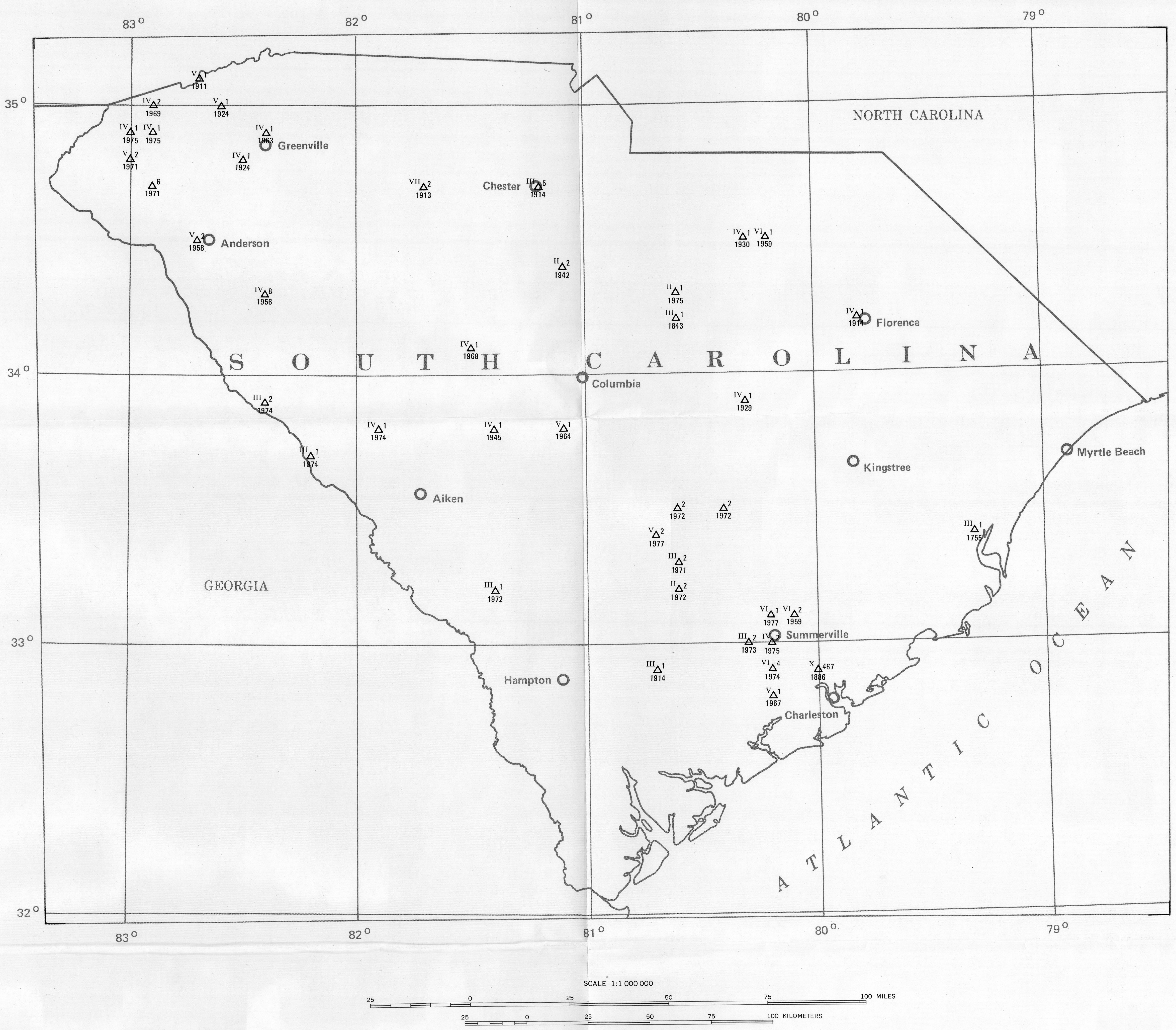
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1225
SEISMICITY, SO. CAROLINA



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.

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:
   ATL - Georgia Institute of Technology, Atlanta, Ga.
   BLA - Virginia Polytechnic Institute and State University, Blacksburg, Va.
   CSC - University of South Carolina, Columbia, S.C.
   GB - Bollinger, 1979, Seismological Society of America Bulletin, v. 69, no. 1, p. 45-63.
   GS - National Earthquake Information Service (and predecessor organizations), U. S. Geological Survey, Golden, Co.
   JLM - Jones, Long, and McKee, 1977, Seismological Society of America Bulletin, v. 67, no. 6, p. 1503-1513.
   PAS - Seimological Laboratory, California Institute of Technology, Pasadena, Ca.
   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.

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.

Table 1.—Chronological listing of Earthquakes for the State of South Carolina

DATE YEAR	MONTH	DAY	ORIGIN TIME(UTC) H M S	LAT. (N.)	LONG. (W.)	DEPTH (KM)	HYPOCENTER QUAL	REF	MAGNITUDE USGS	OTHER	INTENSITY MM	REF
1698	...	..	.. .. ..	32.9	80.0 *	..	H	160	..	.. ..	III*	160
1754	MAY	19	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1755	NOV	..	.. .. ..	33.4	79.3 *	..	H	160	..	.. ..	III*	160
1757	FEB	07	.. .. ..	32.9	80.0 *	..	G	160	..	.. ..	III*	160
1799	APR	04	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	V*	96
1799	APR	11	08 20 ..	32.9	80.0 *	..	G	96	..	.. ..	V*	96
1799	APR	11	21 55 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1817	JAN	08	09 00 ..	32.9	80.0 *	..	I	156	..	.. ..	...	..
1843	FEB	07	15 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1843	APR	11	.. .. ..	34.2	80.6 *	..	H	160	..	.. ..	III*	160
1857	DEC	19	14 04 ..	32.9	80.0	..	G	38	..	.. ..	III*	38
1860	JAN	19	23	32.9	80.0 *	..	H	156	..	.. ..	...	..
1860	OCT	..	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1860	DEC	19	.. .. ..	32.9	80.0 *	..	G	160	..	.. ..	III*	160
1876	OCT	..	.. .. ..	32.9	80.0 *	..	G	160	..	.. ..	III*	160
1876	DEC	12	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1879	OCT	26	.. .. ..	34.4	81.1 *	..	G	84	..	.. ..	II*	84
1886	JUN	..	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	AUG	27	06 30 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	AUG	27	13 30 ..	32.9	80.0 *	..	G	96	..	.. ..	V	96
1886	AUG	28	09 45 ..	32.9	80.0 *	..	G	140	..	.. ..	III*	140
1886	AUG	28	10 30 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	AUG	29	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	SEP	01	02 51 ..	32.9	80.0	..	G	38	..	.. ..	X	96
1886	SEP	01	02 59 ..	32.9	80.0	..	G	38	..	.. ..	...	..
1886	SEP	01	03 09 ..	32.9	80.0 *	..	G	96	..	.. ..	...	..
1886	SEP	01	03 14 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	01	03 30 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	01	05 55 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	01	06 05 ..	32.9	80.0 *	..	G	96	..	.. ..	VI*	96
1886	SEP	01	07 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	01	09 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	01	13 25 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	01	14 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	01	14 59 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	01	18 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	01	22 15 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	01	22 52 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	SEP	02	01 00 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	SEP	02	04 55 ..	32.9	80.0 *	..	G	96	..	.. ..	V	96
1886	SEP	03	04 53 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	04	04 01 ..	32.9	80.0 *	..	G	96	..	.. ..	VI	96
1886	SEP	05	01 37 ..	32.9	80.0 *	..	G	96	..	.. ..	...	..
1886	SEP	06	04 06 ..	32.9	80.0 *	..	G	96	..	.. ..	VI	96
1886	SEP	06	04 15 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	06	12 30 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	06	16 35 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1886	SEP	06	18 40 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	SEP	07	12 00 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	SEP	07	14 00 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	SEP	07	16 30 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	SEP	07	21 52 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	SEP	07	22 00 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	SEP	08	17 55 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	09	06 06 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	10	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	SEP	12	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	SEP	13	14 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	14	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	15	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	SEP	15	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	SEP	21	09 25 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	21	10 15 ..	32.9	80.0 *	..	G	96	..	.. ..	VI*	96
1886	SEP	21	10 30 ..	32.9	80.0 *	..	G	96	..	.. ..	V*	96
1886	SEP	21	21 15 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	22	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	SEP	27	19 02 ..	32.9	80.0 *	..	G	96	..	.. ..	VI	96
1886	SEP	27	22 02 ..	32.9	80.0 *	..	G	96	..	.. ..	V	96
1886	SEP	28	18 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	30	19 20 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	SEP	30	22 10 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	OCT	09	03 40 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1886	OCT	09	05 40 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1886	OCT	09	06 48 ..	32.9	80.0 *	..	G	96	..	.. ..	VI	96
1886	OCT	09	18 46 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	OCT	15	09 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	OCT	15	12 40 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	OCT	22	10 20 ..	32.9	80.0	..	G	38	..	.. ..	VI	38
1886	OCT	22	19 45 ..	32.9	80.0	..	G	38	..	.. ..	VII	38
1886	OCT	23	01 07 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1886	OCT	23	04 54 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	OCT	30	08 40 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	OCT	31	19 21 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	OCT	31	21 46 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	NOV	05	17 20 ..	32.9	80.0	..	G	38	..	.. ..	VI	38
1886	NOV	07	19 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	NOV	17	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1886	NOV	28	15 10 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	NOV	28	18 30 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1886	DEC	01	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	DEC	02	06 36 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	DEC	02	13 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1886	DEC	06	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1887	JAN	03	06 20 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1887	JAN	04	11 44 ..	32.9	80.0 *	..	G	96	..	.. ..	VI	96
1887	JAN	04	12 40 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1887	JAN	11	00 57 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1887	FEB	26	11 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1887	MAR	04	07 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1887	MAR	17	14 09 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1887	MAR	18	23 10 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	138
1887	MAR	19	.. .. ..	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1887	MAR	22	00	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1887	MAR	24	04 05 ..	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1887	MAR	24	10	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1887	MAR	24	.. .. ..	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1887	MAR	27	18	32.9	80.0 *	..	G	138	..	.. ..	II*	138
1887	MAR	28	.. .. ..	32.9	80.0 *	..	G	138	..	.. ..	II*	138
1887	MAR	28	.. .. ..	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1887	MAR	30	00	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1887	MAR	31	.. .. ..	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1887	APR	05	11	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1887	APR	07	04	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1887	APR	08	09	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1887	APR	09	12 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1887	APR	10	11 30 ..	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1887	APR	14	12 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1887	APR	23	.. .. ..	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1887	APR	24	06	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1887	APR	27	02	32.9	80.0 *	..	G	138	..	.. ..	II*	138
1887	APR	27	04	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1887	APR	27	10	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1887	APR	27	11	32.9	80.0 *	..	G	138	..	.. ..	II*	138
1887	APR	28	08	32.9	80.0 *	..	G	138	..	.. ..	V*	138
1887	APR	30	03 10 ..	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1887	APR	30	23 45 ..	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1887	MAY	06	.. .. ..	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1887	MAY	12	03 30 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1887	MAY	12	05	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1887	MAY	14	07 25 ..	32.9	80.0 x	..	G	138	..	.. ..	...	..
1887	MAY	14	.. .. ..	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1887	MAY	16	12	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1887	MAY	17	00	32.9	80.0 *	..	G	138	..	.. ..	II*	138
1887	JUN	03	12 00 ..	32.9	80.0 *	..	G	96	..	.. ..	IV	96
1887	JUN	06	00	32.9	80.0 *	..	G	96	..	.. ..	II	96
1887	JUN	06	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1887	JUL	10	18 00 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1888	JAN	12	14 50 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1888	JAN	12	15 54 ..	32.9	80.0 *	..	G	96	..	.. ..	VI*	96
1888	JAN	15	23 40 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1888	JAN	16	17 52 ..	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1888	FEB	02	03	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1888	FEB	02	.. .. ..	32.9	80.0 *	..	G	138	..	.. ..	II*	138
1888	FEB	29	11	32.9	80.0 *	..	G	138	..	.. ..	V*	138
1888	MAR	03	04 30 ..	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1888	MAR	03	.. .. ..	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1888	MAR	04	.. .. ..	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1888	MAR	14	05	32.9	80.0 *	..	G	138	..	.. ..	V*	138
1888	MAR	20	05	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1888	APR	16	.. .. ..	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1888	APR	16	.. .. ..	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1888	APR	16	16	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1888	APR	20	03	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1888	APR	20	.. .. ..	32.9	80.0 *	..	G	138	..	.. ..	III*	138
1888	MAY	02	.. .. ..	32.9	80.0 *	..	G	138	..	.. ..	IV*	138
1891	OCT	13	05 55 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1891	DEC	05	22 10 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1892	NOV	03	17 25 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1892	NOV	04	04 45 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1892	NOV	04	08 09 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1892	NOV	04	11 20 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1892	NOV	06	07 53 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1892	NOV	08	08 03 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1892	NOV	08	12 25 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1892	NOV	09	21 20 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1892	NOV	10	04 02 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1892	NOV	10	11 58 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1892	NOV	10	22 03 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1892	NOV	11	04 47 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1892	NOV	11	05 34 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1892	NOV	11	07 47 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1892	NOV	12	04 02 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1892	NOV	23	06 20 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1892	DEC	22	07 05 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1892	DEC	22	11 02 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	FEB	14	00 17 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	FEB	14	06 14 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	MAR	02	09 03 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	MAR	02	16 04 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	MAR	03	10 30 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	MAR	03	11 27 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	MAR	08	03 57 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUN	21	09 12 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1893	JUN	21	09 48 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1893	JUN	24	00 22 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1893	JUN	24	06 35 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUN	27	14 31 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUN	29	05 24 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	03	16 55 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	03	19 20 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	04	02 50 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	04	08 45 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	05	04 20 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	05	08 10 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1893	JUL	06	03 20 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	06	05 25 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	06	09 05 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1893	JUL	07	12 15 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	08	04 50 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	08	07 48 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1893	JUL	08	15 25 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1893	JUL	08	15 59 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	09	05 10 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	09	08 00 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	11	03 12 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	12	02 10 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	23	04 15 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	JUL	25	07 54 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	AUG	03	02 05 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	AUG	10	04 00 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	AUG	14	04 10 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	AUG	17	06 25 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	SEP	06	05 10 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	SEP	19	05 25 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	SEP	19	07 05 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1893	SEP	19	07 40 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1893	SEP	19	08 55 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1893	SEP	21	05 40 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1893	SEP	21	07 25 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1893	SEP	22	01 40 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	SEP	25	03 20 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	SEP	25	04 25 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	SEP	25	09 30 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	SEP	27	01 25 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	SEP	30	02 10 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	SEP	30	09 05 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1893	OCT	01	01 50 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1893	OCT	02	01 58 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	OCT	02	03 15 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	OCT	02	03 35 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	OCT	08	04 28 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	OCT	10	01 35 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1893	OCT	17	01 40 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	OCT	24	03 20 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1893	OCT	25	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	NOV	08	04 40 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1893	NOV	08	06 05 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1893	DEC	03	16 35 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1893	DEC	27	06 51 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1893	DEC	27	07 17 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1893	DEC	27	09 09 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1893	DEC	27	09 56 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1893	DEC	28	02 20 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1893	DEC	29	03 46 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1893	DEC	30	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1893	DEC	31	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1894	JAN	10	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1894	JAN	10	08 05 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1894	JAN	10	08 49 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1894	JAN	10	09 15 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1894	JAN	18	06 45 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1894	JAN	30	04 05 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1894	FEB	01	05 21 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1894	FEB	14	05 40 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1894	MAR	05	04 15 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1894	MAR	14	03 25 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1894	MAR	16	19 50 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1894	APR	15	08 20 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1894	MAY	26	08 15 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1894	JUN	06	11 05 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1894	JUN	09	10 55 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1894	JUN	16	01 52 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1894	JUN	16	02 16 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1894	AUG	11	05 10 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1894	AUG	11	17 20 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1894	AUG	14	03 45 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1894	AUG	16	05 06 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1894	AUG	19	04 23 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1894	AUG	19	04 46 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1894	AUG	20	07 40 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1894	SEP	07	04 05 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1894	SEP	10	07 33 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1894	SEP	12	05 10 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1894	SEP	12	05 25 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1894	OCT	27	07 10 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1894	DEC	11	05 27 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1894	DEC	20	09 40 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1894	DEC	20	10 50 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1894	DEC	29	07 59 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1895	JAN	08	05 40 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1895	JAN	08	05 58 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1895	JAN	08	07 29 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1895	JAN	10	08 08 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1895	FEB	07	12 53 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1895	APR	27	07 40 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1895	MAY	06	08 50 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1895	JUL	25	05 46 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1895	JUL	25	06 08 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1895	OCT	06	06 25 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1895	OCT	20	17 08 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1895	OCT	31	11 14 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1895	NOV	06	05 10 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1895	NOV	12	23 33 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1895	NOV	13	03 11 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1895	DEC	03	05 26 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1895	DEC	26	06 46 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1896	FEB	10	04 18 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1896	MAR	01	07 50 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1896	MAR	03	01 45 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1896	MAR	19	08 22 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1896	MAY	21	06 05 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1896	MAY	31	08 09 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1896	JUN	01	09 51 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1896	JUN	23	05 51 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1896	JUN	29	06 49 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1896	JUN	30	05 12 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1896	AUG	07	05 56 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1896	AUG	07	07 45 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1896	AUG	07	09 02 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1896	AUG	11	05 58 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1896	AUG	11	06 14 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1896	AUG	11	08 15 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1896	AUG	11	09 24 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1896	AUG	12	07 42 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1896	AUG	13	03 25 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1896	AUG	14	05 43 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1896	AUG	15	08 16 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1896	AUG	16	08 20 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1896	AUG	17	05 45 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1896	AUG	30	03 24 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1896	SEP	08	13 31 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1896	SEP	08	18 16 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1896	SEP	11	01 50 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1896	SEP	11	05 11 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1896	SEP	13	05 20 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1896	NOV	14	08 15 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1897	FEB	01	12 05 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1897	MAR	17	03 48 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1897	MAR	30	05 20 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1897	JUN	01	05 25 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1897	JUL	10	12 45 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1898	AUG	03	21 30 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1898	SEP	23	14 15 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1899	MAR	10	05 45 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1899	MAR	16	13 45 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1899	MAY	05	10 43 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1899	MAY	18	09 30 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1899	DEC	04	12 48 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1900	JAN	14	10 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1900	MAY	10	23 20 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1900	AUG	11	00 50 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1900	SEP	04	11 05 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1900	SEP	24	19 36 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1901	JAN	..	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1901	SEP	..	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1901	SEP	05	06 38 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1901	SEP	14	13 26 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1901	SEP	16	17 06 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1901	SEP	17	13 35 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1901	SEP	29	01 25 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1901	DEC	02	00 26 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1902	JAN	22	15 11 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1902	FEB	05	04 25 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1902	MAR	18	01 45 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1902	MAR	26	09 20 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1902	MAY	16	03 30 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1902	MAY	24	14 05 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1902	SEP	28	20 04 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1902	NOV	20	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1903	JAN	24	01	32.9	80.0 *	..	G	96	..	.. ..	IV	96
1903	JAN	29	12 15 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1903	JAN	31	10 54 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1903	FEB	03	10 06 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1903	MAY	09	10 49 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1903	JUN	17	03 49 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1903	AUG	25	14 56 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1903	DEC	24	19 35 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1904	MAR	06	01 40 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1904	MAR	16	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1904	JUN	19	14 15 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1904	JUN	22	23 00 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1904	SEP	05	14 53 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1904	SEP	10	14 27 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1904	OCT	01	08 45 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1904	NOV	15	16 47 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1904	DEC	06	22 48 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1905	MAR	05	14 15 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1905	JUN	04	00	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1905	JUL	23	07 15 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1905	JUL	23	07 25 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1905	OCT	11	18 45 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1905	OCT	16	07 10 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1905	DEC	28	03 15 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1906	AUG	05	06 20 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1907	APR	19	08 30 ..	32.9	80.0	..	G	38	..	.. ..	V	38
1908	JAN	15	19 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1908	JAN	15	19 01 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1908	MAR	03	21 06 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1908	MAR	07	06 50 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1908	OCT	26	04 10 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1908	DEC	28	11 24 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1909	FEB	26	04 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1909	AUG	21	13 36 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1909	DEC	14	23 00 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1910	MAY	02	09 15 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1910	SEP	02	07 18 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1910	SEP	12	18 29 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1911	APR	20	.. .. ..	35.1	82.7 *	..	G	71	..	.. ..	V	38
1911	NOV	24	12 17 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1912	MAR	31	20 25 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1912	JUN	12	10 30 ..	32.9	80.0 *	..	G	96	..	.. ..	VII	38
1912	JUN	29	.. .. ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1912	AUG	30	16 52 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1912	SEP	29	08 06 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1912	NOV	17	12 30 ..	32.9	80.0 *	..	G	96	..	.. ..	IV*	96
1912	NOV	26	03 32 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1912	DEC	07	19 10 ..	34.7	81.7	..	G	84	..	.. ..	III*	84
1912	DEC	15	16 54 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1913	JAN	01	18 28 ..	34.7	81.7	..	G	38	..	.. ..	VII	162
1913	JAN	26	00 37 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1913	FEB	05	21 06 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1913	MAR	09	16 30 ..	32.9	80.0 *	..	G	96	..	.. ..	III*	96
1913	JUN	06	18 20 ..	32.9	80.0 *	..	G	96	..	.. ..	II*	96
1914	MAR	06	20 30 ..	34.7	81.2 *	..	G	135	..	.. ..	III*	135
1914	MAR	07	01 20 ..	34.2	79.8 *	..	G	84	..	.. ..	IV*	84
1914	JUN	01	04 03 ..	32.9	80.7 *	..	G	84	..	.. ..	III	84
1914	JUN	19	08 13 ..	32.9	80.0 *	..	G	84	..	.. ..	III	84
1914	JUL	14	01 53 ..	32.9	80.0 *	..	G	84	..	.. ..	IV	135
1914	JUL	14	08 00 ..	32.9	80.0 *	..	G	84	..	.. ..	II	84
1914	SEP	22	07 04 ..	32.9	80.0 *	..	G	84	..	.. ..	V	38
1914	DEC	23	11 55 ..	32.9	80.0 *	..	G	84	..	.. ..	II	84
1915	DEC	13	00 55 ..	32.9	80.0 *	..	G	84	..	.. ..	III*	84
1915	DEC	20	00 55 ..	32.9	80.0 *	..	G	103	..	.. ..	III*	103
1916	MAR	02	05 02 ..	34.5	82.7	..	G	84	..	.. ..	IV*	84
1916	APR	16	11 56 ..	32.9	80.0 *	..	G	84	..	.. ..	II	84
1916	APR	30	06 45 ..	32.9	80.0 *	..	G	84	..	.. ..	III*	84
1916	JUN	25	12 05 ..	32.9	80.0 *	..	G	84	..	.. ..	III	84
1916	JUL	14	18 18 ..	32.9	80.0 *	..	G	84	..	.. ..	...	..
1916	SEP	24	09 42 ..	32.9	80.0 *	..	G	84	..	.. ..	II	84
1917	APR	11	19 01 ..	32.9	80.0 *	..	G	84	..	.. ..	II*	84
1920	AUG	01	11 53 ..	32.9	80.0 *	..	G	84	..	.. ..	II*	84
1921	APR	19	23 45 ..	32.9	80.0 *	..	G	84	..	.. ..	III	84
1921	APR	23	23 48 ..	32.9	80.0 *	..	G	84	..	.. ..	III	84
1922	AUG	08	09 25 ..	32.9	80.0 *	..	G	84	..	.. ..	II*	84
1923	MAR	24	04 25 ..	32.9	80.0 *	..	G	84	..	.. ..	III	84
1923	MAY	04	10 55 ..	34.3	82.4 *	..	G	137	..	.. ..	II	137
1924	JAN	01	01 06 ..	34.8	82.5 *	..	G	84	..	.. ..	IV	84
1924	FEB	14	16 06 ..	32.9	80.0 *	..	G	84	..	.. ..	III	84
1924	JUN	03	15 43 ..	32.9	80.0 *	..	G	84	..	.. ..	III	84
1924	OCT	20	08 30 ..	35.0	82.6	..	G	38	..	.. ..	V	38
1928	DEC	19	22 17 ..	32.9	80.0 *	..	G	1	..	.. ..	II*	1
1929	JAN	03	12 05 ..	33.9	80.3	..	G	2	..	.. ..	IV*	2
1929	OCT	28	02 15 ..	34.3	82.4	..	G	2	..	.. ..	IV*	2
1930	SEP	03	01 30 ..	32.9	80.0 *	..	G	3	..	.. ..	III*	3
1930	DEC	10	00 02 ..	34.3	82.4	..	G	3	..	.. ..	IV*	3
1930	DEC	10	08	34.3	82.4	..	G	3	..	.. ..	II*	3
1930	DEC	26	03	34.5	80.3	..	G	3	..	.. ..	IV*	3
1932	JAN	06	12 35 ..	32.9	80.0 *	..	G	5	..	.. ..	II*	5
1932	JAN	13	12 40 ..	32.9	80.0 *	..	G	5	..	.. ..	II*	5
1933	JUL	26	02 34 ..	32.9	80.0 *	..	G	6	..	.. ..	III	6
1933	DEC	19	14 12 ..	32.9	80.0 *	..	G	6	..	.. ..	IV	6
1933	DEC	23	09 40 ..	32.9	80.0 *	..	G	6	..	.. ..	V*	6
1933	DEC	23	09 55 ..	32.9	80.0 *	..	G	6	..	.. ..	IV*	6
1934	DEC	09	09	32.9	80.0 *	..	G	7	..	.. ..	IV	7
1935	FEB	06	12 36 ..	32.9	80.0 *	..	G	8	..	.. ..	III*	8
1935	OCT	20	16 20 ..	32.9	80.0 *	..	G	8	..	.. ..	III*	8
1936	DEC	30	03 50 ..	32.9	80.0 *	..	G	9	..	.. ..	II*	9
1937	OCT	25	19 01 ..	32.9	80.0 *	..	G	10	..	.. ..	II*	10
1938	AUG	05	00 14 ..	32.9	80.0 *	..	G	11	..	.. ..	II*	11
1940	JAN	05	08 46 ..	32.9	80.0 *	..	G	13	..	.. ..	III*	13
1940	JAN	05	13 45 ..	32.9	80.0 *	..	G	13	..	.. ..	III*	13
1940	OCT	08	03 20 ..	32.9	80.0 *	..	G	13	..	.. ..	II*	13
1940	DEC	27	09 32 ..	32.9	80.0 *	..	G	13	..	.. ..	II*	13
1942	NOV	01	02 20 ..	34.4	81.1 *	..	G	15	..	.. ..	II*	15
1943	DEC	28	14 25 ..	32.9	80.0 *	..	G	16	..	.. ..	IV*	16
1944	JAN	28	17 30 ..	32.9	80.0 *	..	G	17	..	.. ..	IV*	17
1945	JAN	30	20 20 ..	32.9	80.0 *	..	G	18	..	.. ..	IV*	18
1945	MAY	18	12 20 ..	32.9	80.0 *	..	G	18	..	.. ..	III*	18
1945	MAY	18	12 40 ..	32.9	80.0 *	..	G	18	..	.. ..	III*	18
1945	JUN	05	12 10 ..	32.9	80.0 *	..	G	18	..	.. ..	II*	18
1945	JUL	26	10 32 16.4	33.75	81.38	005	B	201	..	5.6PAS 3	IV*	38
1946	FEB	08	18 09 ..	32.9	80.0 *	..	G	19	..	.. ..	III*	19
1947	NOV	02	04 30 ..	32.9	80.0 *	..	G	20	..	.. ..	IV*	20
1949	FEB	02	10 52 ..	32.9	80.0 *	..	G	22	..	.. ..	IV*	22
1949	JUN	27	06 53 ..	32.9	80.0 *	..	G	22	..	.. ..	IV*	22
1951	MAR	04	02 55 ..	32.9	80.0 *	..	G	24	..	.. ..	IV*	24
1951	MAR	08	00 20 ..	32.9	80.0 *	..	G	24	..	.. ..	II*	24
1951	MAR	10	08 18 ..	32.9	80.0 *	..	G	24	..	.. ..	II*	24
1951	DEC	30	07 55 ..	32.9	80.0 *	..	G	24	..	.. ..	IV*	24
1952	SEP	27	12 32 ..	32.9	80.0 *	..	G	25	..	.. ..	III*	25
1952	NOV	19	.. .. ..	32.9	80.0 *	..	G	25	..	.. ..	V	25
1956	JAN	05	08 00 ..	34.3	82.4 *	..	G	29	..	.. ..	IV	29
1956	JAN	05	08 30 ..	34.3	82.4 *	..	G	29	..	.. ..	IV*	29
1956	MAY	19	19 00 ..	34.3	82.4 *	..	G	29	..	.. ..	IV*	29
1956	MAY	27	23 25 ..	34.3	82.4 *	..	G	29	..	.. ..	IV	29
1958	OCT	20	06 16 ..	34.5	82.7 *	..	G	31	..	.. ..	V	31
1959	AUG	03	06 08 36.8	33.05	80.13	001	B	201	..	.. ..	VI	32
1959	OCT	27	02 07 28	34.5	80.2	..	G	38	..	.. ..	VI	38
1960	MAR	12	12 47 44.0	33.07	80.12	009	B	201	..	.. ..	V	38
1960	JUL	24	03 37 30	32.9	80.0 *	..	G	33	..	.. ..	V	33
1961	MAY	20	15 43 ..	32.9	80.0 *	..	G	34	..	.. ..	III	34
1961	OCT	18	00 35 ..	32.9	80.0 *	..	G	34	..	.. ..	III	34
1963	APR	11	17 45 ..	34.9	82.4 *	..	G	36	..	.. ..	IV	36
1963	MAY	04	21 01 50.3	32.97	80.19	005	B	201	..	3.3JLM 5	IV	36
1964	APR	20	19 04 44.1	33.84	81.10	003	B	201	..	3.5JLM 5	V	38
1965	SEP	09	04 37 16	34.7	81.2 *	..	G	75	..	.. ..	...	..
1965	SEP	09	14 42 20	34.7	81.2 *	..	G	75	..	3.9JLM 5	...	..
1965	SEP	10	07 32 00	34.7	81.2 *	..	G	75	..	3.0JLM 5	...	..
1965	SEP	12	18 25 02	34.7	81.2 *	..	G	75	..	2.9JLM 5	...	..
1967	OCT	23	09 04 02.5	32.80	80.22	019	B	201	3.8	3.4GB 2	V	40
1968	JUL	10	04 24 ..	32.9	80.0 *	..	G	41	..	.. ..	II*	41
1968	JUL	10	10 46 ..	32.9	80.0 *	..	G	41	..	.. ..	II*	41
1968	JUL	12	01 12 ..	32.9	80.0 *	..	G	41	..	.. ..	IV	41
1968	SEP	22	21 41 18.2	34.11	81.48	001	B	201	3.7	3.5JLM 5	IV	41
1969	DEC	13	10 19 29.7	35.04	82.85	006	A	201	..	3.4GB 2	IV	132
1971	MAY	19	12 54 03.6	33.36	80.66	001	B	201	3.4	3.7GB 2	IV	163
1971	JUN	10	04 19 ..	34.7	82.9	..	D	203	..	2.8JLM 5	...	..
1971	JUL	13	08 15 ..	34.76	82.98*	..	F	44	..	.. ..	...	..
1971	JUL	13	09 39 ..	34.7	82.9	..	D	203	..	2.8JLM 5	...	..
1971	JUL	13	10 54 ..	34.7	82.9	..	D	203	..	2.9JLM 5	...	..
1971	JUL	13	11 07 ..	34.7	82.9	..	D	203	..	2.7JLM 5	...	..
1971	JUL	13	11 42 26.0	34.76	82.98	..	B	163	..	3.8GB 2	V*	163
1971	JUL	13	11 49 ..	34.7	82.9	..	D	203	..	2.9JLM 5	...	..
1971	JUL	13	15 06 ..	34.7	82.9	..	D	203	..	3.0JLM 5	...	..
1971	JUL	31	20 16 55.0	33.34	80.63	004	B	201	..	3.8BLA 2	III	163
1971	AUG	11	.. .. ..	33.2	80.6 *	..	F	163	..	3.5BLA 2	...	..
1972	FEB	03	23 11 09.7	33.31	80.58	002	B	201	4.5	4.5GB 2	II	45
1972	FEB	04	02 46 ..	33.5	80.4 *	..	A	45	..	.. ..	...	..
1972	FEB	04	02 53 ..	33.5	80.4 *	..	A	45	..	.. ..	...	..
1972	FEB	06	.. .. ..	33.2	80.6 *	..	G	45	..	.. ..	II*	45
1972	FEB	07	02 46 ..	33.46	80.58	..	D	203	..	3.2JLM 5	...	..
1972	FEB	07	02 53 ..	33.46	80.58	..	D	203	..	3.2JLM 5	...	..
1972	AUG	14	15 05 19	33.2	81.4 *	..	F	45	..	3.0ATL 1	III*	45
1973	DEC	19	10 16 08.7	32.97	80.27	006	B	201	..	3.0JLM 5	III*	46
1974	OCT	08	23 22 28	33.9	82.4 *	..	F	47	3.1	.. ..	III*	47
1974	OCT	28	11 33 00.0	33.79	81.92	..	G	74	..	3.0CSC 1	IV	74
1974	NOV	05	03 00 ..	33.73	82.22	..	F	74	..	3.7CSC 1	III	74
1974	NOV	22	05 25 56.7	32.93	80.16	006	A	201	4.7	4.3GB 2	VI	111
1974	DEC	03	08 25 ..	33.9	82.4 *	..	F	74	..	3.6CSC 1	III	74
1975	APR	28	05 46 51.9	32.97	80.23	..	A	88	..	3.0SLM 2	IV	88
1975	OCT	18	04 31 ..	34.9	83.0 *	..	F	90	..	.. ..	IV	90
1975	NOV	16	01 01 03.5	34.26	80.57	007	A	90	..	2.8GS 2	II	90
1975	NOV	25	15 17 34.8	34.94	82.89	010	A	201	..	3.2SLM 2	IV	90
1975	DEC	08	18 02 23	35.0	82.9 *	..	F	48	..	.. ..	II	48
1977	JAN	18	18 29 13.5	33.07	80.20	005	A	97	..	3.0BLA 2	VI	97
1977	MAR	30	08 27 46.9	32.88	80.20	010	A	97	..	.. ..	V	97
1977	MAY	31	23 50 13.2	32.95	80.24	008	A	94	..	2.3GS 2	II	94
1977	AUG	25	04 20 07.0	33.39	80.69	010	A	98	..	3.1BLA 2	V	98
1977	DEC	15	07 15 55.0	33.00	80.29	009	C	74	..	2.5BLA 3	...	..
1977	DEC	15	19 16 43.1	32.92	80.22	009	A	92	..	3.0BLA 2	V	92

Table 2.—List of data sources

1. Heck, N. H. and Bodle, R. R., 1930, United States Earthquakes 1928, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 483, p. 1-28.
2. Heck, N. H. and Bodle, R. R., 1931, United States Earthquakes 1929, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 511, p. 1-55.
3. Neumann, F. and Bodle, R. R., 1932, United States Earthquakes 1930, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 539, p. 1-25.
5. Neumann, F., 1934, United States Earthquakes 1932, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 563, p. 1-21.
6. Neumann, F., 1935, United States Earthquakes 1933, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 579, p. 1-82.
7. Neumann, F., 1936, United States Earthquakes 1934, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 593, p. 1-99.
8. Neumann, F., 1937, United States Earthquakes 1935, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 600, P. 1-90.
9. Neumann, F., 1938, United States Earthquakes 1936, U. S. Department of Commerce, Coast and Geodetic Survey, Serial NO. 610, p. 1-45.
10. Neumann, F., 1940, United States Earthquakes 1937, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 619, p. 1-55.
11. Neumann, F., 1940, United States Earthquakes 1938, U. S. Department of Commerce, Coast and GEodetic Survey, Serial No. 629, p. 1-59.
13. Neumann, F., 1942, United States Earthquakes 1940, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 647, p. 1-74.
15. Bodle, R. R., 1944, United States Earthquakes 1942, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 662, p. 1-44.
16. Bodle, R. R., 1945, United States Earthquakes 1943, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 672, p. 1-47.
17. Bodle, R. R., 1946, United States Earthquakes 1944, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 682, p. 1-43.
18. Bodle, R. R. and Murphy, L. M., 1947, United States Earthquakes 1945, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 699, p. 1-38.
19. Bodle, R. R. and Murphy, L. M., 1948, United States Earthquakes 1946, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 714, p. 1-48.
20. Murphy, L. M., 1950, United States Earthquakes 1947, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 730, p. 1-62.
22. Murphy, L. M. and Ulrich, F. P., 1951, United States Earthquakes 1949, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 748, p. 1-64.
24. Murphy, L. M. and Cloud, W. K., 1953, United States Earthquakes 1951, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 762, p. 1-50.
25. Murphy, L. M. and Cloud, W. K., 1954, United States Earthquakes 1952, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 773, p. 1-112.
29. Brazee, R. J. and Cloud, W. K., 1958, United States Earthquakes 1956, U. S. Department of Commerce, Coast and Geodetic Survey, p. 1-78.
31. Brazee, R. J. and Cloud, W. K., 1960, United States Earthquakes 1958, U. S. Department of Commerce, Coast and Geodetic Survey, p. 1-76.
32. Eppley, R. A. and Cloud, W. K., 1961, United States Earthquakes 1959, U. S. Department of Commerce, Coast and Geodetic Survey, p. 1-115.
33. Talley, H. C. and Cloud, W. K., 1962, United States Earthquakes 1960, U. S. Department of Commerce, Coast and Geodetic Survey, p. 1-90.
34. Lander, J. F. and Cloud, W. K., 1963, United States Earthquakes 1961, U. S. Department of Commerce, Coast and Geodetic Survey, p. 1-106.
36. Cloud, W. K. and von Hake, C. A., 1965, United States Earthquakes 1963, U. S. Department of Commerce, Coast and Geodetic Survey, p. 1-69.
38. Coffman, J. L. and von Hake, C. A., 1973, Earthquake History of the United States, U. S. Department of Commerce, National Oceanic Oceanic and Atmospheric Administration, No. 41-1 (through 1970), p. 1-208.
40. von Hake, C. A. and Cloud, W. K., 1969, United States Earthquakes 1967, U. S. Department of Commerce, Coast and Geodetic Survey, p. 1-90.
41. Coffman, J. L. and Cloud, W. K., 1970, United States Earthquakes 1968, U. S. Department of Commerce, Environmental Science Services Administration, p. 1-111.
44. Coffman, J. L. and von Hake, C. A., 1973, United States Earthquakes 1971, U. S. Department of Commerce, National Oceanic and Atmospheric Administration, p. 1-174.
45. Coffman, J. L. and von Hake, C. A., 1974, United States Earthquakes 1972, U. S. Department of Commerce, National Oceanic and Atmospheric Administration, p. 1-119.
46. Coffman, J. L., von Hake, C. A., Spence, W., Carver, D. L., Covington, P. A., Dunphy, G. J., Irby, W. L., Person, W. J., and Stover, C. W., 1975, United States Earthquakes 1973, U. S. Department of Commerce, National Oceanic and Atmospheric Administration and U. S. Department of Interior, Geological Survey, p. 1-112.
47. Coffman, J. L. and Stover, C. W., 1976, United States Earthquakes 1974, U. S. Department of Commerce, National Oceanic and Atmospheric Administration and U. S. Department of Interior, Geological Survey, p. 1-135.
48. Coffman, J. L. and Stover, C. W., 1977, United States Earthquakes 1975, U. S. Department of Commerce, National Oceanic and Atmospheric Administration and U. S. Department of Interior, Geological Survey, p. 1-136.
71. MacCarthy, G. R., 1957, An annotated list of the North Carolina earthquakes: Elisha Mitchell Scientific Society Journal, v. 73, no. 1, p. 84-100.
74. U. S. Department of Interior, Geological Survey, Preliminary Determination of Epicenters, Monthly Listing and associated Earthquake Data Report, April 1966 to December 1977 (formerly by U. S. Coast and Geodetic Survey, Environmental Science Services Administration, and National Oceanic and Atmospheric Administration of the U. S. Department of Commerce).
75. von Hake, C. A. and Cloud, W. K., 1967, United States Earthquakes 1965, U. S. Department of Commerce, Coast and Geodetic Survey, p. 1-91.
84. Woollard, G. P., 1968, A catalogue of earthquakes in the United States prior to 1925 based on unpublished data compiled by Harry Fielding Reid and unpublished sources prior to 1930, Hawaii Institute of Geophysics, University of Hawaii, Data Report No. 10.
88. Person, W. J., Simon, R. B., and Stover, C. W., 1977, Earthquakes in the United States, April-June 1975, U. S. Department of Interior, Geological Survey Circular 749-B, p. 1-27.
90. Minsch, J. H., Stover, C. W., Person, W. J., and Simon, R. B., 1977, Earthquakes in the United States, October-December 1975, U. S. Department of Interior, Geological Survey Circular 749-D, p. 1-27.
92. Stover, C. W., Minsch, J. H., and Simon, R. B., 1979, Earthquakes in the United States, October-December 1977, U. S. Department of Interior, Geological Survey Circular 788-D, p. 1-35.
94. Minsch, J. H., Stover, C. W., and Simon, R. B., 1979, Earthquakes in the United States, April-June 1977, U. S. Department of Interior, Geological Survey Circular 788-B, p. 1-22.
96. Taber, S., 1914, Seismic activity in the Atlantic coastal plain near Charleston, South Carolina: Seismological Society of America Bulletin, v. 4, no. 3, p. 108-160.
97. Simon, R. B., Stover, C. W., and Reagor, B. G., 1979, Earthquakes in the United States, January-March 1977, U. S. Department of Interior, Geological Survey Circular 788-A, p. 1-31.
98. Stover, C. W., Simon, R. B., and Person, W. J., 1979, Earthquakes in the United States, July-September, 1977, U. S. Department of Interior, Geological Survey Circular 788-C, p. 1-26.
103. McClain, W. C. and Meyers, O. M., 1970, Seismic history and seismicity of the southeastern region ot the United States, Oak Ridge National Laboratory, Oak Ridge, Tenn., Union Carbide Corp., for the U. S. Atomic Energy Commission, p. 1-43.
111. Stover, C. W., Simon, R. B., and Person, W. J., 1976, Earthquakes in the United States, October-December 1974, U. S. Department of Interior, Geological Survey Circular 723-D, p. 1-27.
132. Moneymaker, B. C., 1972, Earthquakes in Tennessee and nearby sections of neighboring states, 1951-1970, Tennessee Academy of Science Journal, v. 47, no. 4, p. 124-132.
135. Taber, S., 1915, Earthquakes in South Carolina during 1914: Seismological Society of America Bulletin, v. 5, no. 2, p. 96-99.
137. Neumann, F. R., 1924, The southern Appalachian earthquake of October 20, 1924: Seismological Society of America Bulletin, v. 14, no. 4, p. 223-229.
138. Louderback, G. D., 1944, The personal record of Ada M. Trotter of certain aftershocks of the Charleston earthquake of 1886: Seismological Society of America Bulletin, v. 34, no. 4, p. 199-206.
140. Dutton, C. E., 1889, The Charleston earthquake of August 31, 1886, in Ninth Annual Report of the United States Geological Survey to the Secretary of the Interior 1887-1888, p. 209-528.
156. MacCarthy, G. R., 1961, North Carolina earthquakes 1958 and 1959, with additions and corrections to previous lists, Elisha Mitchell Scientific Society Journal, v. 77, no. 1, p. 62-64.
160. Wallace, D. D., 1934, The history of South Carolina, The American Historical Society, Inc., v. 3, p. 333-335.
162. Taber, S., 1913, The South Carolina earthquake of January 1, 1913: Seismological Society of America Bulletin, v. 3, p. 6-13.
163. Bollinger, G. A., 1972, Historical and recent seismic activity in South Carolina: Seismological Society of America Bulletin, v. 62, no. 3, p. 851-864.
201. Dewey, J. W. and Gordon, D. W., 1980, Instrumental seismicity of eastern North America, U. S. Geological Survey (unpublished data).
203. Jones, F. B., Long, L. T., and McKee, J. H., 1977, Study of the attenuation and azimuthal dependence of seismic wave propagation in the southeastern United States, Seismological Society of Americal Bulletin. v. 67, no. 6, p.1503-1513.

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.

SEISMICITY MAP OF THE STATE OF SOUTH CAROLINA

By

B. G. Reagor, C. W. Stover, and S T. Algermissen

1980

INTERIOR—GEOLOGICAL SURVEY, RESTON, VA.—1980

For sale by Branch of Distribution, U.S. Geological Survey, 1200 South Eads Street, Arlington, VA 22202

REPRINTED, 1983