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A CATALOG OF HISTORICAL EARTHQUAKES IN CHINA COMPILED FROM RECENT CHINESE PUBLICATIONS

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ABSTRACT

A catalog of historical earthquakes in China from 1177 B.C. to 1899 A.D. has been compiled in a form suitable for computers. The data include the date, epicenter, magnitude, and epicentral intensity of the earthquake as well as the province where the earthquake occurred. The source materials are publications in Chinese of the Institute of Geophysics, Academia Sinica. Some of the historical events are evidently related to large faults that are easily discernible from satellite images. Comparing the historical seismicity map to epicenters located by the World Wide Standardized Seismograph Network stations since 1962, we may see the influence of population distribution on the historical data.

INTRODUCTION

In evaluating earthquake hazards for a given region, it is necessary to know its earthquake history. Gutenberg and Richter (1954) concluded that adequate instrumental records for locating earthquakes on a worldwide basis date back only to 1904. We must, therefore, rely upon historical records for earthquake data before the twentieth century. Recently, Ambraseys (1971) demonstrated the usefulness of historical records in studying the seismicity of the Middle East. Another region that has rich historical records is China, where recorded history extends back some 3,000 years.

Many attempts to compile a catalog of historical earthquakes in China have been made. Earlier efforts have been reviewed by Drake (1912), and more recent work was summarized by Lee (1974), and Lee and Wang (1976). In the early 1950's extensive efforts to study the historical earthquakes in China were initiated by the Academia Sinica in Peking. Information on historical earthquakes in China was systematically gathered, quantified, and published. As a result, it was fairly simple to compile a catalog from recent Chinese publications and codify the data in a form suitable for input to computers. The purpose of this paper is to bring to the attention of Western seismologists the existence of this important set of data.

Earthquakes in the past may be classified into two distinct groups: "historical" and "instrumental". By "historical" we mean that earthquakes parameters are deduced from descriptive records, whereas "instrumental" earthquakes are located using seismograms. In this paper, we have limited ourselves to "historical" earthquakes in China, and considered only earthquakes before 1900 A.D. In a subsequent paper, we will consider the "instrumental" earthquakes in China, i.e. the period after 1900 A.D.

SOURCE MATERIALS

In order to provide data on earthquake hazards for the purposes of industrialization planning in China, the Seismological Committee of the Academia Sinica, in the 1950's, initiated a systematic study of Chinese historical earthquakes. The first task the committee did was to compile, as completely as possible, all descriptions of earthquakes in

Chinese literature and other documents. In 1956, two large volumes totaling 1653 pages were published under the title of "Chronological Tables of Earthquake Data of China" (Academia Sinica, 1956), and covered the period from 1189 B.C. to 1955 A.D. Descriptions of earthquakes were extracted from over 8,000 documents (many of them are multi-volume publications) and were arranged by provinces. Within each province, entries were arranged in chronological order. Source references were cited, and notes were added to clarify ancient geographic names and errors in reporting. A summary of earthquake activity for each province was given, and an index by county and city of felt earthquakes was also included.

Attempts to quantify the historical descriptions of earthquakes were also carried out by the Academia Sinica. The results were published under the title "Catalog of Chinese Earthquakes" (Academia Sinica, 1970a), and covered the period from 1177 B.C. to 1949 A.D. In this volume, the date, epicenter, magnitude, and epicentral intensity were provided for selected earthquakes noted in the 1956 compilation. Selections were based on whether or not sufficient information exists to deduce an earthquake location and magnitude. A brief summary of large earthquakes in China with magnitudes greater than or equal to 6 was also published (Academia Sinica, 1970b) and revised later (Academia Sinica, 1974). It covered the period from 780 B.C. to 1973 A.D.

Method of Compilation and Listings

We have codified on punched cards a catalog of historical earthquakes in China before 1900 A.D. based on the data published in Academia Sinica (1970a). In a few instances, we have consulted Academia Sinica (1956) for clarification. We have also cross-checked the data for earthquakes with magnitude greater than or equal to 6 with Academia Sinica (1974), and adopted the latter figures whenever discrepancies occurred. (The catalog is available at a cost of $10 from the National Geophysical and Solar Terrestrial Data Center, NOAA/EDS, Boulder, Colorado 80303, USA.)

The format of the punched cards is specified as follows (FORTRAN format for data is given in parenthesis):

Columns 9 to 13 (I5):	Year; a "—" sign denotes B.C., otherwise it is A.D.; a "?" in column 14 indicates doubt regarding the year of the earthquake occurrence.
Columns 15 to 16 (I2):	Month; a "?" in column 17 indicates doubt regarding the month of the earthquake occurrence.
Columns 18 to 19 (I2):	Day; a "?" in column 20 indicates doubt regarding the day of the earthquake occurrence.
Columns 32 to 35 (F4.1):	Latitude of epicenter in degrees; the "N" in column 37 indicates north latitude.
Columns 39 to 43 (F5.1):	Longitude of epicenter in degrees; the "E" in column 45 indicates east longitude.
Column 47 (A1):	If a "?" appears in this column, it means that the earthquake epicenter is very uncertain, as indicated in the Chinese text.
Columns 52 to 55 (F4.2):	Estimated earthquake magnitude given to $\frac{1}{4}$ unit.
Columns 57 to 60 (F4.1):	Estimated epicentral intensity.
Columns 70 to 77 (A8):	Province where the earthquake occurred.
Column 80 (A1):	A "*" indicates revision according to Academia Sinica (1974).

In the process of coding, we used the median value wherever a range of values was given for a parameter. For example, if the intensity value was given as "6 to 7", we used "6.5". In many cases when the date of the earthquake was given by the season of the year, we used "3?", "6?", "9?", and "12?" in the columns for month to represent "spring", "summer", "autumn", and "winter", respectively.

Our codified catalog of Chinese historical earthquakes is listed chronologically in Table 1. Some blank columns on the punched cards have been eliminated in the listing to save space. Because of political and population changes in the last 3,000 years, the data are obviously not uniform for all China. Therefore, it may be useful to consider the

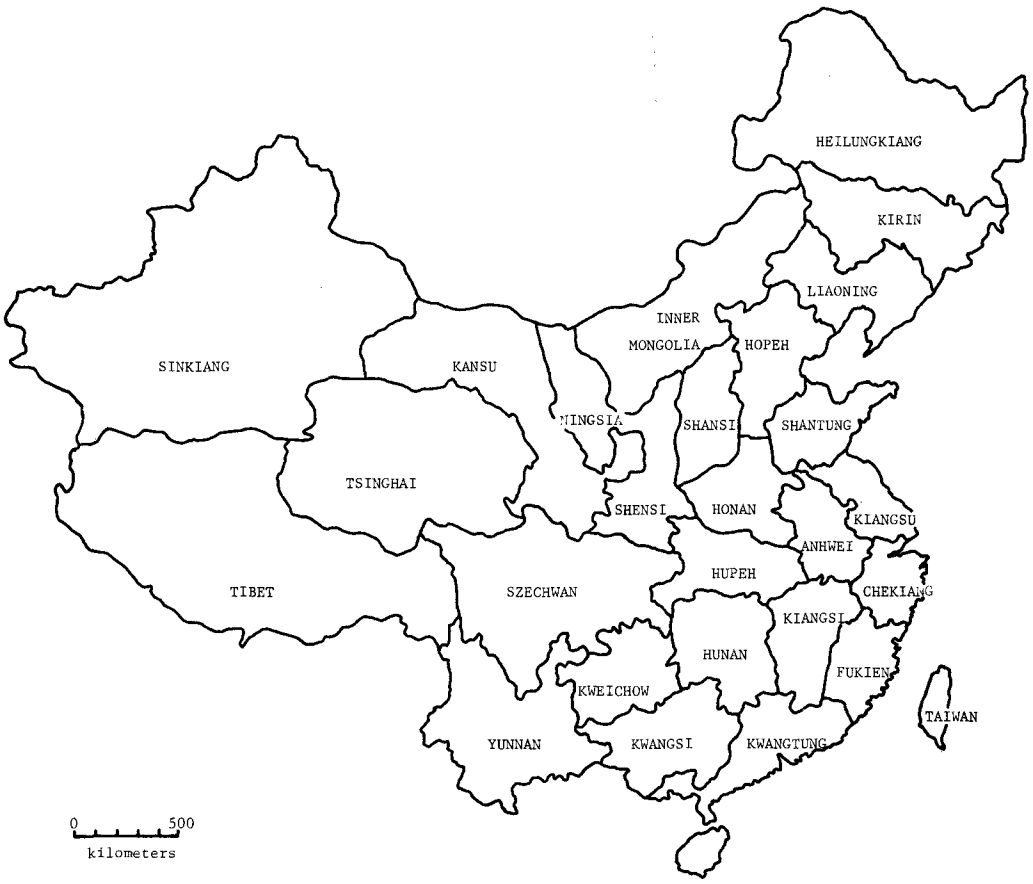

FIG. 1. Provinces of China. Modified from Hsieh (1973, p. 260).

data at the provincial level. A map of China by province is shown in Figure 1, and historic earthquakes are listed by province in Table 2. Within each province, the data are listed chronologically.

DIFFICULTIES AND LIMITATIONS

The accuracy and completeness of the Chinese historical earthquake data are difficult to evaluate. The questions are: How accurately and completely were the data recorded, passed down through history, and interpreted in the publications by Academia Sinica? Although fairly complete dynasty records began at about 200 B.C., printing did not

TABLE 1

Chronological List of Chinese Historical Earthquakes

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	-1177			34.5 N	107.8 E	4.5		SHENSI
2	-780			34.5 N	107.8 E ?	6.5		SHENSI
3	-231			36.5 N	111.5 E	6.5	8.	SHANSI
4	-193	2		35.4 N	103.9 E	6.5		KANSU
5	-186	2	22	33.4 N	104.8 E	6.5		KANSU
6	-159	6		32.2 N	110.4 E	5.	6.	HOPEH
7	-154			32.2 N	110.4 E	5.	6.	HUPEH
8	-142?			32.2 N	110.4 E	5.	6.	HUPEH
9	- 70	6	1	36.3 N	114.0 E	7.0	9.	SHANTUNG
10	- 47	4	17	35.1 N	104.6 E	6.75	9.	KANSU
11	- 35	7		34.4 N	109.0 E	5.	6.5	SHENSI
12	- 26			28.8 N	104.6 E	5.5	7.	SZECHWAN
13	46	10	23	33.0 N	112.5 E	6.5	8.	HONAN
14	128	2	23	34.7 N	105.4 E	6.5	8.	KANSU
15	138	3	1	35.5 N	104.0 E	6.75	9.	KANSU
16	143	10		34.7 N	105.3 E ?	7.0	9.	KANSU
17	180	9?		39.4 N	99.5 E	7.5	10.	KANSU
18	294	7		32.6 N	116.8 E	5.5	7.	ANHWEI
19	294	9		40.3 N	116.0 E	5.5	7.	HOPEH
20	319	6	17	34.0 N	105.2 E	4.5		KANSU
21	344			36.3 N	114.5 E	5.5		HOPEH
22	373	8		36.6 N	101.8 E	4.75	6.	TSINGHAI
23	406	6		36.3 N	104.5 E	5.5		KANSU
24	409			36.8 N	118.3 E	5.	6.5	SHANTUNG
25	408			39.0 N	100.5 E	4.75	6.	KANSU
26	416			34.3 N	105.5 E	5.	6.	KANSU
27	421			41.6 N	120.4 E	5.	6.	LIAONING
28	462	8	16	35.6 N	116.8 F	5.5		SHANTUNG
29	495	3	31	37.5 N	121.2 E	5.5	7.	SHANTUNG
30	506	8	30	37.9 N	102.6 F	4.75	6.	KANSU
31	512	5	21	39.0 N	113.0 F	7.5	10.	SHANSI
32	575	1	14	37.9 N	102.6 E	5.5	7.	KANSU
33	600	12	13	34.3 N	108.9 F	5.5	7.	SHENSI
34	625	8	15	27.9 N	102.3 E	4.75	6.	SZECHWAN
35	638	2	11	32.6 N	103.6 F	5.	6.	SZECHWAN
36	643	9	12	36.1 N	111.5 E	5.5	7.	SHANSI
37	692	3?		37.5 N	117.5 E	5.	6.	SHANTUNG
38	734	3	19	34.7 N	106.3 E	7.0	9.	KANSU
39	756	11	27	39.0 N	100.5 F	6.0	7.	KANSU
40	777			37.8 N	115.2 F	6.0	8.	HOPEH
41	788	3	8	32.5 N	109.2 E	6.5	8.	SHENSI
42	793	5	27	34.5 N	109.7 E ?	6.0	7.5	SHENSI
43	814	4	2	27.9 N	102.2 E	6.5		SZECHWAN
44	835	4	11	34.3 N	108.9 E	4.75	6.	SHENSI
45	836	2	25	34.3 N	108.9 F	4.75	6.	SHENSI
46	839			34.4 N	104.0 E	6.5		KANSU
47	865	12		35.9 N	111.4 E	5.5	7.	SHANSI
48	867	2	14	35.9 N	111.4 E	5.5	7.	SHANSI
49	876	7	14	37.8 N	105.9 E	6.5	8.	NINGSIA
50	879	3		34.2 N	109.3 E	4.75	6.	SHENSI
51	880	2		34.5 N	107.8 E	4.75	6.	SHENSI
52	886			25.7 N	100.2 E	5.5	7.	YUNNAN
53	953	11		36.3 N	115.1 E	4.75	6.	HOPEH
54	993	10		31.8 N	119.9 E	5.5	7.	KIANGSU
55	1010	11		38.1 N	106.4 E	5.5	7.	NINGSIA
56	1011	8		38.2 N	114.6 F	4.75	6.	HOPEH
57	1022	4		39.7 N	113.1 E	6.5	8.	SHANSI
58	1038	1	9	38.4 N	112.9 F	7.25	10.	SHANSI
59	1046	4	18	37.8 N	120.7 E	5.	6.	SHANTUNG
60	1057			39.5 N	116.3 E ?	6.75	9.	HOPEH
61	1067	11		23.6 N	116.5 E	6.75	9.	KWANGTU.
62	1068	8	14	38.5 N	116.1 E	6.0	8.	HOPEH
63	1069	1	18	38.3 N	116.8 E	4.75	6.	HOPEH
64	1076	12		39.9 N	116.4 E	5.	6.	HOPEH
65	1092	12?		37.9 N	102.6 F	4.75	6.	KANSU
66	1111			25.7 N	100.2 E	5.	6.5	YUNNAN
67	1125	8	30	36.0 N	103.9 E	7.0	9.	KANSU
68	1143	4		38.5 N	106.3 F	6.5	8.	NINGSIA
69	1169	1	24	31.9 N	104.4 E	4.75	6.	SZECHWAN
70	1203	12	04	36.0 N	111.8 E	6.5	8.5	SHANSI
71	1213	6	26	29.6 N	119.0 E	4.75	6.	CHEKIANG
72	1216	3	17	28.3 N	103.6 E	6.5		SZECHWAN
73	1219	5	21	36.0 N	106.2 E	6.5	8.5	NINGSIA
74	1290	9	27	41.5 N	119.3 E	6.75	9.	LIAONING *
75	1291	8	25	36.1 N	111.5 E	6.5	8.	SHANSI
76	1303	9	17	36.3 N	111.7 E	8.0	11.	SHANSI
77	1304	2		36.1 N	111.5 E	5.5	7.	SHANSI
78	1304	9	3	37.5 N	112.6 F	4.75	6.	SHANSI
79	1305	5	3	39.8 N	113.1 E	6.5	8.5	SHANSI
80	1306	9	12	35.9 N	106.1 E	6.5	8.5	NINGSIA
81	1314	10	5	36.5 N	113.8 E	6.0	8.	HOPEH
82	1316			36.4 N	111.1 E	5.5	7.	SHANSI
83	1322			40.6 N	115.0 E	4.5		HOPEH
84	1336	3?		30.1 N	115.9 F	4.7	6.	HUPEH
85	1337	9	8	40.4 N	115.7 E ?	6.5	8.	HOPEH
86	1338	8	2	40.4 N	115.2 E	5.	6.	HOPEH
87	1342	5	5	37.9 N	112.6 E	5.5	7.	SHANSI
88	1346	4		37.1 N	118.0 E	4.75	6.	SHANTUNG
89	1351	5	14	37.3 N	113.0 E ?	5.5	7.	SHANSI
90	1352	4	18	35.6 N	105.3 E ?	7.0	9.	KANSU
91	1361	9?		28.8 N	115.3 E	5.	6.	KIANGSI
92	1368	7	8	37.6 N	112.5 E	6.0	7.	SHANSI
93	1372	8	16	32.0 N	118.8 E	4.75	6.	KIANGSU
94	1372	9	17	23.1 N	113.3 E	4.75	6.	KWANGTU.
95	1378	4	30	38.5 N	106.3 E	5.75	7.	NINGSIA
96	1399	4	29	32.0 N	118.8 E	4.75	6.	KIANGSU
97	1407	11		31.2 N	112.6 E	5.5	7.	HUPEH
98	1425	3	7	31.7 N	116.5 E	5.75	7.	ANHWEI
99	1427			27.9 N	102.3 E	5.	6.5	SZECHWAN
100	1433			30.5 N	115.2 F	4.75	6.	HUPEH
101	1440	10	26	36.2 N	103.4 E	6.25	8.	KANSU
102	1445			23.4 N	112.6 F	4.75	6.	KWANGTU.
103	1445	12	12	24.6 N	117.6 E	6.0	7.5	FUKIEN
104	1446			23.6 N	102.9 E	5.	6.5	YUNNAN
105	1448	9	30	38.3 N	109.7 E	5.	6.5	SHENSI
106	1454	8		25.1 N	99.2 E	5.	6.	YUNNAN
107	1467	1	19	27.1 N	101.4 F	6.5	9.	SZECHWAN *
108	1467	6	9	39.6 N	112.3 E	5.5	7.	SHANSI
109	1469	11	4	31.2 N	112.6 E	5.	6.5	HUPEH
110	1474	10	27	26.5 N	100.1 E	5.5	7.	YUNNAN
111	1474	12	11	38.0 N	106.3 E	5.5	7.	NINGSIA
112	1477	3	19	35.2 N	104.2 E	5.	6.	KANSU
113	1477	5	13	38.5 N	106.3 E	6.5	8.	NINGSIA
114	1478	8	17	27.5 N	101.6 F	5.5	7.	SZECHWAN
115	1481	7	15	26.5 N	100.0 E	6.0	8.	YUNNAN
116	1484	1	29	40.4 N	116.1 E	6.75	8.5	HOPEH
117	1485	1	17	34.8 N	110.4 E	5.	6.5	SHANSI
118	1485	5	27	40.2 N	118.0 E	5.	6.	HOPEH
119	1487	8	10	34.3 N	109.1 E	6.25	8.	SHENSI
120	1488			25.7 N	101.3 E	4.75	6.	YUNNAN
121	1488	9	15	31.7 N	103.9 E	5.5	6.5	SZECHWAN
122	1494	3	24	25.5 N	103.8 E	5.5	7.	YUNNAN
123	1495	4	10	37.6 N	105.6 E	6.25	8.	NINGSIA
124	1497	2	17	36.3 N	112.9 E	4.75	6.	SHANSI
125	1498	11	14	26.1 N	100.0 E	4.75	6.	YUNNAN
126	1499	7	17	25.3 N	100.4 E	5.5	6.5	YUNNAN
127	1500	1	4	24.9 N	103.1 E	6.75	9.	YUNNAN
128	1501	1	19	34.8 N	110.1 E	7.	9.	SHENSI
129	1501	2	3	26.5 N	99.9 E	5.5	7.	YUNNAN
130	1502	1	17	34.8 N	110.1 E	5.	6.	SHENSI
131	1502	10	17	35.7 N	115.3 E	6.5	8.	HONAN *
132	1505	7	10	37.8 N	105.9 E	5.5	7.	NINGSIA
133	1505	10	16	35.3 N	110.8 E	5.	6.	SHANSI
134	1506	3	19	35.3 N	110.1 E	5.5	7.	SHENSI
135	1506	4	27	25.4 N	103.3 E	5.5	7.	YUNNAN
136	1506	8	28	36.3 N	120.7 E	4.75	6.	SHANTUNG
137	1507	11	4	24.5 N	102.5 E	5.25	6.	YUNNAN
138	1509			28.6 N	112.4 F	4.75	6.	HUNAN
139	1511	5	12	25.0 N	101.5 E	5.5	7.	YUNNAN
140	1511	11	17	26.5 N	100.0 E	5.75	7.	YUNNAN
141	1512	10	8	25.0 N	98.7 E	6.5	8.	YUNNAN
142	1514	5	17	25.7 N	100.2 F	5.75	7.5	YUNNAN
143	1514	9	18	25.1 N	99.2 E	5.5	7.	YUNNAN
144	1515	6	17	26.6 N	100.8 E	7.5	10.	YUNNAN
145	1515	10	23	25.7 N	100.2 F	6.0	8.	YUNNAN
146	1516	9		25.1 N	118.2 E	4.75	6.	FUKIEN
147	1517	7	12	24.1 N	102.6 E	5.5	7.	YUNNAN
148	1518	7	2	25.4 N	101.8 E	4.75	6.	YUNNAN
149	1519			25.7 N	100.2 E	5.	6.	YUNNAN
150	1519	9		23.7 N	117.2 E	4.75	6.	FUKIEN
151	1520	3	26	25.3 N	100.3 E	5.5	7.	YUNNAN
152	1520	5		25.2 N	116.2 F	4.75	6.	FUKIEN
153	1520	6	8	26.6 N	100.2 F	5.	6.	YUNNAN
154	1520	8	18	24.5 N	100.9 E	5.75	7.	YUNNAN
155	1522	1	28	34.2 N	114.1 F	5.75	7.	HONAN
156	1523	8	14	30.0 N	122.1 E	5.5	7.	CHEKIANG
157	1524	2	4	33.8 N	113.9 F	5.75	7.	HONAN
158	1524	4	5	19.2 N	110.5 E	5.	6.	KWANGTU.
159	1525	5	21	25.8 N	105.2 F	5.	6.	KWEICHOW
160	1526	5	30	25.8 N	105.2 E	5.	6.	KWEICHOW
161	1527			39.8 N	118.1 E	5.5	7.	HOPEH
162	1528	6?		37.9 N	114.7 F	5.	6.	HOPEH
163	1532	11	6	39.9 N	116.9 E	5.5	7.	HOPEH
164	1535	5		25.8 N	116.4 E	4.5		FUKIEN
165	1536	3	19	28.2 N	102.2 E	6.75	9.	SZECHWAN *
166	1536	10	22	39.8 N	116.8 E	6.	7.5	HOPEH
167	1537	5	13	33.6 N	117.6 E	5.5	7.	ANHWEI
168	1538			38.0 N	115.6 E	5.	6.	HOPEH
169	1539	8	8	23.6 N	102.8 E	5.5	6.5	YUNNAN
170	1542			39.0 N	111.0 E	5.	6.	SHANSI
171	1542	11	19	34.7 N	104.9 F	5.	6.	KANSU
172	1549	9	13	37.8 N	120.7 E	6.	8.	SHANTUNG
173	1549	6		37.0 N	111.9 E	5.	6.	SHANSI
174	1551	6?		25.8 N	105.2 E	5.	6.	KWEICHOW
175	1556	1		29.4 N	113.1 E	5.5	7.	HUNAN
176	1556	1	23	34.5 N	109.7 F	8.	11.	SHENSI
177	1556	12	3	38.8 N	101.1 E	5.	6.	KANSU
178	1558	6		23.4 N	111.5 E	5.5	7.	KWANGTU.
179	1558	6		37.5 N	112.2 E	5.	6.	SHANSI
180	1558	11	21	34.5 N	109.7 E	5.5	7.	SHENSI
181	1560			24.1 N	102.7 E	5.5	7.	YUNNAN
182	1560	4		24.9 N	103.2 F	5.5	7.	YUNNAN
183	1561	2	21	38.8 N	101.1 E	5.	6.	KANSU
184	1561	7	25	37.4 N	106.0 E	7.25	9.5	NINGSIA
185	1562			38.5 N	106.3 E	5.	6.	NINGSIA
186	1562			25.8 N	116.0 F	5.	6.	KIANGSI
187	1562	6		39.7 N	118.7 E	5.	6.	HOPEH
188	1567			39.7 N	119.2 E	4.75	6.	HOPEH
189	1568	1		34.2 N	109.3 E	5.	6.	SHENSI
190	1568	4	1	38.5 N	106.3 E	5.75	7.	NINGSIA
191	1568	4	2	34.4 N	109.2 F	5.5	7.	SHENSI
192	1568	4	12	33.1 N	107.0 E	5.	6.	SHENSI
193	1568	4	25	39.0 N	119.0 E	6.		HOPEH
194	1568	5	15	34.4 N	109.0 E	6.75	9.	SHENSI
195	1569			32.7 N	109.0 E	5.	6.	SHENSI
196	1569			34.6 N	110.3 E	5.	6.	SHENSI
197	1571	5	26	23.9 N	113.5 E	5.	6.	KWANGTU.
198	1571	9	9	24.1 N	102.7 E	6.	8.	YUNNAN
199	1572			25.5 N	103.8 F	5.	6.	YUNNAN
200	1573	1	10	34.4 N	104.0 E	6.75	8.5	KANSU

TABLE 1—*Continued*

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
201	1574			27.6 N	119.1 E	5.5	7.	CHEKIANG
202	1574	8	19	26.1 N	119.3 E	5.75	7.	FUKIEN
203	1577	3	13	25.0 N	98.6 E	6.5	8.	YUNNAN
204	1578	2	17	25.1 N	110.2 E	4.75	6.	KWANGSI
205	1579	7	17	40.4 N	115.7 E	5.	6.	HOPEH
206	1579	1		25.1 N	99.2 E	5.	6.	YUNNAN
207	1580	9	5	39.5 N	112.3 E	5.5	7.	SHANSI
208	1581	5	18	39.8 N	114.5 E	6.	7.5	HOPEH
209	1581	7		33.0 N	104.6 E	5.5	7.	KANSU
210	1582	3		40.1 N	113.2 E	5.	6.	SHANSI
211	1583	5	18	39.7 N	113.8 E ?	5.5	7.	SHANSI
212	1584	3	6	30.8 N	115.7 E	5.5	7.	HUPEH
213	1584	4		38.4 N	111.9 E	4.75	6.	SHANSI
214	1585	3	6	31.2 N	117.7 E	6.	7.	ANHWEI *
215	1586	3		25.3 N	100.3 E	5.5	7.	YUNNAN
216	1586	5	26	39.9 N	116.3 E	5.	6.	HOPEH
217	1587	4	10	35.3 N	113.5 E	6.	7.	HONAN
218	1587	10	4	35.2 N	110.8 E	5.	6.	SHANSI
219	1588	1		25.0 N	98.6 E	5.5	7.	YUNNAN
220	1588	8		38.4 N	112.8 E	5.	6.	SHANSI
221	1588	8	9	24.0 N	102.8 E	6.	8.	YUNNAN
222	1589			24.8 N	110.5 E	4.75	6.	KWANGSI
223	1590	7		36.5 N	102.7 E	5.	6.	TSINGHAI
224	1590	7	7	35.4 N	103.9 E	5.5	7.	KANSU
225	1591			36.6 N	110.2 E	5.	6.	SHENSI
226	1591	11	21	38.8 N	101.1 E	5.	6.	KANSU
227	1594	10	24	42.6 N	124.0 E	5.	6.	LIAONING
228	1596	10		25.0 N	118.7 E	4.75	6.	FUKIEN
229	1597	2	14	31.9 N	104.3 E	5.	6.	SZECHWAN
230	1599			35.6 N	109.2 E	5.	6.	SHENSI
231	1599	8		25.5 N	110.4 E	4.75	6.	KWANGSI
232	1599	10	16	25.4 N	103.0 E	5.	6.	YUNNAN
233	1600	7		21.6 N	110.3 E	4.75	6.	KWANGTU.
234	1600	9	29	23.5 N	117.0 E	7.	9.	KWANGTU.
235	1602	6?		25.8 N	105.2 E	4.75	6.	KWEICHOW
236	1602	10		26.2 N	100.0 E	5.	6.	YUNNAN
237	1603	5	30	31.2 N	112.6 E	5.	6.	HUPEH
238	1604	10	25	34.2 N	105.0 E	6.	7.5	KANSU
239	1604	12	29	25.0 N	119.5 E	8.		FUKIEN
240	1605	7	13	19.9 N	110.5 E	7.5	10.	KWANGTU.
241	1606	11	30	23.6 N	102.8 E	6.5	8.5	YUNNAN
242	1608	9	23	37.5 N	105.7 E	5.5	7.	NINGSIA
243	1609	7	11	39.2 N	99.0 E	6.75	9.	KANSU
244	1610	1	25	28.5 N	104.6 E	5.5	7.	SZECHWAN
245	1610	3	9	32.5 N	104.5 E	5.5	7.	SZECHWAN
246	1611			21.4 N	111.0 E	5.	6.	KWANGTU.
247	1611	4		24.0 N	97.8 E	4.75	5.5	YUNNAN
248	1612	3	12	25.4 N	103.3 E	5.5	6.5	YUNNAN
249	1612	12		25.5 N	103.9 E	5.	6.	YUNNAN
250	1614	10	23	37.2 N	112.5 E	6.	7.5	SHANSI
251	1615	3	1	32.0 N	120.9 E	5.	6.	KIANGSU
252	1615	7	20	38.8 N	106.3 E	5.5	7.	NINGSIA
253	1615	8	24	25.0 N	101.5 E	5.5	7.	YUNNAN
254	1616	2	10	37.8 N	105.9 E	5.75	7.	NINGSIA
255	1616	10	10	40.9 N	116.0 E	5.	6.	HOPEH
256	1619			19.7 N	110.0 E	5.	6.	KWANGTU.
257	1619	5	20	37.0 N	111.9 E	6.5	8.	SHANSI
258	1619	11	16	39.8 N	114.5 E	6.	7.5	HOPEH
259	1619?			25.8 N	99.4 E	5.	6.	YUNNAN
260	1620	10	19	37.1 N	117.5 E	4.75	6.	SHANTUNG
261	1620	12		25.6 N	103.3 E	5.	6.5	YUNNAN
262	1621	3		39.4 N	116.8 E	5.5	7.	HOPEH
263	1621	5		39.1 N	110.9 E	5.	6.	SHENSI
264	1621	12?		31.0 N	120.7 E	5.	6.	KIANGSU
265	1622	3	18	35.5 N	116.0 E	6.	7.5	SHANTUNG
266	1622	4	17	36.6 N	116.8 E ?	5.5	7.	SHANTUNG
267	1622	9		34.7 N	107.7 E	5.	6.	SHENSI
268	1622	10	25	36.5 N	106.3 E	7.	9.5	NINGSIA
269	1623	5	4	25.5 N	100.5 E	6.	7.5	YUNNAN
270	1623	12	26	36.0 N	115.1 E	4.75	6.	HONAN
271	1624	2	10	32.5 N	119.5 E	6.	7.	KIANGSU
272	1624	3	26	26.5 N	99.9 E	5.5	7.	YUNNAN
273	1624	3?		38.4 N	112.8 E	5.	6.	SHANSI
274	1624	4	17	39.7 N	118.7 E	6.25	8.	HOPEH
275	1624	7	4	35.4 N	105.9 E	6.	7.5	KANSU
276	1624	7	19	38.8 N	115.5 E	5.5	7.	HOPEH
277	1624	7		26.9 N	100.2 E	5.	6.	YUNNAN
278	1624	9	1	31.1 N	121.4 E	5.	6.	KIANGSU
279	1624	9		33.2 N	107.5 E	5.5	7.	SHENSI
280	1625	4		38.3 N	116.8 E	5.	6.	HOPEH
281	1626	6	28	39.4 N	114.2 E	7.	9.	SHANSI
282	1626	10	8	26.9 N	109.7 E	5.	6.	HUNAN
283	1627	2	16	37.5 N	105.5 E	6.	8.	NINGSIA
284	1627	6?		37.6 N	113.7 E	5.5	7.	SHANSI
285	1628	12?		33.0 N	104.6 E	5.5	7.	KANSU
286	1629	3		36.0 N	103.9 E	5.	6.	KANSU
287	1630			30.7 N	113.5 E	5.	6.	HUPEH
288	1630	1	16	32.6 N	104.1 E	6.25	8.	SZECHWAN
289	1630	10	14	30.4 N	113.5 E	5.	6.	HUPEH
290	1631			33.7 N	106.2 E	5.	6.	KANSU
291	1631	7	21	35.3 N	104.3 E	5.	6.	KANSU
292	1631	7		35.5 N	107.8 E	5.	6.	KANSU
293	1631	8	14	29.2 N	111.7 E	6.5	8.	HUNAN
294	1631	9	1	28.3 N	110.2 E	5.	6.	HUNAN
295	1631	9		25.8 N	105.2 E	4.75	6.	KWEICHOW
296	1633			32.4 N	109.7 E	5.	6.	HUPEH
297	1633			37.3 N	111.8 E	5.	6.	SHANSI
298	1634	1		34.0 N	105.2 E	6.	7.5	KANSU
299	1634	3		30.7 N	115.1 E	5.5	6.5	HUPEH
300	1634	12		35.1 N	107.7 E	5.5	7.	KANSU
301	1635	10	26	33.2 N	107.5 E	5.5	7.	SHENSI
302	1636			33.1 N	107.0 E	5.5	7.	SHENSI
303	1636			37.0 N	108.9 E	4.75	6.	SHENSI
304	1638	1		36.6 N	105.7 E	5.5	7.	NINGSIA
305	1640	4		34.7 N	112.5 E	5.	6.	HONAN
306	1640	9		30.4 N	114.9 E	5.	6.	HUPEH
307	1641	6	21	34.3 N	105.5 E	4.75	6.	KANSU
308	1641	11	26	23.6 N	116.5 E	5.75	7.	KWANGTU.
309	1642			33.0 N	118.4 E	5.	6.	KIANGSU
310	1642	6	30	34.9 N	111.1 E	6.	8.	SHANSI
311	1642	12		25.5 N	101.3 E	5.	6.	YUNNAN
312	1643	12		25.9 N	101.1 E	5.5	7.	YUNNAN
313	1651	2	15	26.2 N	116.6 E	5.5	7.	FUKIEN
314	1652	2	10	31.4 N	116.3 E	5.	6.	ANHWEI
315	1652	3	23	31.5 N	116.5 E	6.	7.5	ANHWEI
316	1652	7	13	25.4 N	100.5 E	6.75	9.	YUNNAN
317	1652	8		33.4 N	104.8 E	5.5	7.	KANSU
318	1653			33.1 N	107.0 E	5.	6.	SHENSI
319	1653	8	12	21.7 N	110.2 E	5.	5.5	KWANGTU.
320	1654	7	21	34.3 N	105.5 E	7.5	10.	KANSU
321	1654	9	15	36.1 N	115.6 E	5.5	7.	SHANTUNG
322	1655			23.0 N	120.2 E	5.5	7.	TAIWAN
323	1655	4	17	24.4 N	102.5 E	5.	6.5	YUNNAN
324	1656	3		22.8 N	113.0 E	4.75	6.	KWANGTU.
325	1657	4	21	31.5 N	103.7 E	6.0	8.	SZECHWAN *
326	1658	2	3	39.4 N	115.7 E	6.	7.5	HOPEH
327	1661	2	15	23.0 N	120.2 E	6.	7.5	TAIWAN
328	1662			33.4 N	120.1 E	4.75	6.	KIANGSU
329	1662	10	11	33.2 N	114.8 E	5.5	7.	HONAN
330	1664			38.7 N	112.7 E	5.5	7.	SHANSI
331	1664	4		26.1 N	100.0 E	5.	6.	YUNNAN
332	1664	4	1	39.9 N	116.7 E	4.75	6.	HOPEH
333	1665			37.9 N	102.6 E	5.	6.	KANSU
334	1665	4	16	39.9 N	116.7 E	6.5	8.	HOPEH
335	1668	7	25	35.3 N	118.6 E	8.5	12.	SHANTUNG
336	1670	7		25.2 N	102.2 E	5.5	7.	YUNNAN
337	1671	9		35.3 N	118.0 E	5.	6.	SHANTUNG
338	1673	3	29	31.8 N	117.3 E	5.	6.	ANHWEI
339	1673	10	18	40.5 N	114.1 E	5.5	7.	SHANSI
340	1673	10	18	39.0 N	111.0 E	5.5	6.5	SHANSI
341	1675			34.1 N	114.8 E	5.5	7.	HONAN
342	1675	6		34.8 N	111.1 E	4.75	6.	SHANSI
343	1675	6		35.6 N	115.9 E	5.	6.	SHANTUNG
344	1677	9		33.4 N	104.8 E	5.5	7.	KANSU
345	1677	12		25.5 N	101.3 E	5.5	7.	YUNNAN
346	1678	6?		40.7 N	115.3 E	5.	6.	HOPEH
347	1679	9	2	40.0 N	117.0 E	8.	11.	HOPEH
348	1679	10		37.5 N	112.5 E	5.5	7.	SHANSI
349	1680	9	9	25.0 N	101.5 E	6.5	8.5	YUNNAN
350	1683	10	10	23.0 N	113.2 E	5.	6.	KWANGTU.
351	1683	11	22	38.7 N	112.7 E	7.	9.	SHANSI
352	1686			37.1 N	106.4 E	5.	6.	NINGSIA
353	1686	5	12	23.5 N	120.4 E	5.5	6.5	TAIWAN
354	1688	6	14	26.5 N	99.9 E	6.25	8.	YUNNAN
355	1692	9	12	24.5 N	103.8 E	5.5	7.	YUNNAN
356	1693	4	25	23.0 N	115.4 E	5.	6.	KWANGTU.
357	1694	5		25.0 N	121.5 E	5.5	6.5	TAIWAN
358	1695	5	18	36.0 N	111.5 E	8.	10.	SHANSI
359	1698			41.5 N	121.2 E	5.	6.	LIAONING
360	1699	9?		29.8 N	99.7 E	4.75	6.	KANSU
361	1701			25.2 N	102.5 E	5.75	7.	YUNNAN
362	1704	9	18	38.0 N	116.5 E	5.5	7.	HOPEH
363	1704	9	28	34.9 N	106.8 E	6.	7.5	SHENSI
364	1707	3?		25.2 N	103.1 E	5.	6.	YUNNAN
365	1708	10	26	36.7 N	114.7 E	5.5	7.	HOPEH
366	1709	10	14	37.4 N	105.3 E	7.5	9.5	NINGSIA
367	1710			28.5 N	117.6 E	4.75	6.	KIANGSI
368	1710	4	16	27.8 N	111.3 E	5.5	7.	HUNAN
369	1711	10	22	23.5 N	120.0 E	6.5	8.	TAIWAN
370	1713	2	26	25.4 N	103.2 E	6.5	9.	YUNNAN
371	1713	9	4	32.0 N	103.7 E	6.5	8.	SZECHWAN
372	1719	6	19	35.0 N	105.2 E	7.5	10.	KANSU
373	1720	7	12	40.4 N	115.5 E	6.75	9.	HOPEH
374	1721	1	5	23.0 N	120.3 E	6.	8.	TAIWAN
375	1722	2		24.1 N	102.5 E	5.	6.	YUNNAN
376	1722	3		25.1 N	102.0 E	5.	6.	YUNNAN
377	1724			40.4 N	115.2 E	5.	6.	HOPEH
378	1725	1	8	25.1 N	103.1 E	6.	8.	YUNNAN
379	1725	7		30.0 N	102.0 E	5.5	7.	SZECHWAN
380	1729	9		25.6 N	100.3 E	5.	6.	YUNNAN
381	1730	9	30	40.0 N	116.2 E	6.5	8.	HOPEH
382	1730	12?		36.9 N	117.9 E	5.	6.5	SHANTUNG
383	1731	11		31.4 N	121.0 E	5.	6.	KIANGSU
384	1732	1	29	27.7 N	102.2 E	6.	8.	SZECHWAN *
385	1732	11		23.7 N	102.5 E	5.	6.	YUNNAN
386	1733	8	2	26.2 N	103.1 E	6.75	9.	YUNNAN *
387	1734	3		30.3 N	103.5 E	5.	6.	SZECHWAN
388	1736	1	30	23.1 N	120.3 E	6.	8.	TAIWAN
389	1737	9	30	35.3 N	113.8 E	5.5	6.	HONAN
390	1738			33.0 N	96.6 E	6.5	8.	TSINGHAI
391	1738	5	19	33.2 N	104.2 E	5.5	7.	SZECHWAN
392	1739	1	3	38.9 N	106.5 E	8.	10.	NINGSIA
393	1739	2	13	38.5 N	106.3 E	5.5	7.	NINGSIA
394	1740	9		24.0 N	102.8 E	5.	6.5	YUNNAN
395	1742			32.0 N	110.8 E	5.	6.	HUPEH
396	1743	6	29	30.7 N	118.4 E	5.5	7.	ANHWEI
397	1746	7	29	40.2 N	116.2 E	5.	6.	HOPEH
398	1748	2	23	31.3 N	103.4 E	5.5	7.	SZECHWAN
399	1748	8	29	30.5 N	101.5 E	5.5	7.	SZECHWAN
400	1748	11	21	36.4 N	106.1 E	5.5	7.	NINGSIA

TABLE 1—*Continued*

TABLE 1—*Continued*

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
401	1750	9	15	24.7 N	102.9 E	5.5	7.	YUNNAN
402	1751			23.7 N	102.4 E	5.	6.	YUNNAN
403	1751	3		23.8 N	106.9 E	4.75	6.	KWANGSI
404	1751	5	25	26.5 N	99.9 E	6.5	9.	YUNNAN
405	1754	4		25.0 N	101.5 E	5.	6.	YUNNAN
406	1754	5		37.7 N	112.5 E	5.	6.	SHANSI
407	1755	1	27	24.7 N	102.2 E	6.5	8.	YUNNAN
408	1755	2	8	23.8 N	102.7 E	6.	8.	YUNNAN
409	1757	6	13	25.0 N	98.5 E	5.25	7.	YUNNAN
410	1761	5	23	24.4 N	102.5 E	6.	8.	YUNNAN
411	1761	11	3	24.4 N	102.5 E	6.	7.	YUNNAN
412	1763	12	30	24.3 N	102.8 E	6.5	8.	YUNNAN
413	1765	2	9	44.7 N	82.9 E	6.	7.5	SINKIANG
414	1765	3	15	41.8 N	123.4 E	5.5	7.	LIAONING
415	1765	5	1	35.3 N	103.9 E	5.25	7.	KANSU
416	1765	9	2	34.8 N	105.0 E	6.5	8.5	KANSU
417	1772	3	1	38.3 N	114.4 E	5.	6.	HOPEH
418	1776	12		23.5 N	120.5 E	5.5	7.	TAIWAN
419	1781	10	3	25.9 N	101.1 E	5.	6.	YUNNAN
420	1782	4	30	26.2 N	111.7 E	5.	6.	HUNAN
421	1783			25.6 N	103.8 E	5.	6.5	YUNNAN
422	1785			25.0 N	98.5 E	5.	6.	YUNNAN
423	1785	4	18	39.9 N	98.0 E	6.	7.5	KANSU
424	1785	12?		30.5 N	101.5 E	5.	6.	SZECHWAN
425	1786			29.1 N	110.4 E	5.	6.	HUNAN
426	1786	6	1	29.9 N	102.3 E	7.5	9.	SZECHWAN
427	1786	6	18	44.0 N	80.8 E	6.	7.	SINKIANG
428	1786	7		25.0 N	98.5 E	5.	6.	YUNNAN
429	1787	12	13	31.0 N	103.7 E	4.75	6.	SZECHWAN
430	1789	6	7	24.2 N	102.8 E	6.5	9.	YUNNAN
431	1789	11	7	34.6 N	110.3 E	5.	6.	SHENSI
432	1791	2	11	38.0 N	115.5 E	5.	6.	HOPEH
433	1791	3		23.5 N	116.7 E	5.	6.	KWANGTU.
434	1791	4	8	24.5 N	117.7 E	5.5	6.5	FUKIEN
435	1792	4		27.4 N	118.6 E	5.	6.	KIANGSI
436	1792	8	7	23.6 N	120.5 E	6.75	9.	TAIWAN
437	1792	9	7	30.5 N	101.5 E	6.	8.	SZECHWAN
438	1792	11	30	30.5 N	101.5 E	5.5	7.	SZECHWAN
439	1793	5	15	30.5 N	101.5 E	6.	7.5	SZECHWAN
440	1795	8	5	39.7 N	118.7 E	5.25	6.5	HOPEH
441	1796	3		36.0 N	119.4 E	5.	6.	SHANTUNG
442	1797			23.0 N	120.2 E	5.	6.	TAIWAN
443	1799	8	27	23.8 N	102.4 E	6.5	8.5	YUNNAN
444	1803	2	1	25.6 N	100.6 E	6.	7.5	YUNNAN
445	1804	12?		24.9 N	115.6 E	5.	6.	KIANGSI
446	1805	6	25	37.1 N	114.5 E	5.	6.	HOPEH
447	1805	8	5	39.7 N	119.2 E	5.5	7.	HOPEH
448	1806	1	11	25.3 N	115.7 E	6.	7.5	KIANGSI
449	1811	3	18	25.2 N	121.3 E	6.5		TAIWAN
450	1811	9	27	31.7 N	100.3 E	6.	7.5	SZECHWAN
451	1812	3	8	43.7 N	83.0 E	7.5		SINKIANG
452	1812	4	2	34.6 N	110.6 E	5.	6.	HONAN
453	1813			36.0 N	111.4 E	5.25	6.5	SHANSI
454	1813	10	17	28.0 N	120.7 E	4.75	5.5	CHEKIANG
455	1814	2	4	35.8 N	114.4 E	5.25	7.	HONAN
456	1814	11	24	23.7 N	102.5 E	6.	7.5	YUNNAN
457	1815	7	11	24.7 N	121.8 E	5.5	7.	TAIWAN
458	1815	8	6	39.0 N	117.5 E	5.	6.	HOPEH
459	1815	10	13	25.2 N	121.2 E	6.5	8.	TAIWAN
460	1815	10	23	34.8 N	111.2 E	6.75	9.	SHANSI
461	1816	3?		24.8 N	121.8 E	5.5	7.	TAIWAN
462	1819	2	24	36.3 N	102.3 E	5.75	7.	TSINGHAI
463	1819	9	14	26.5 N	107.2 E	5.75	6.5	KWEICHOW
464	1820	8	3	34.1 N	113.9 E	6.	8.	HONAN *
465	1820	10		34.8 N	111.2 E	5.	6.	HONAN
466	1822	6	18	33.0 N	104.6 E	5.5	7.	KANSU
467	1823	8		32.5 N	107.9 E	5.	6.	SHENSI
468	1825	10		25.9 N	119.0 E	5.	6.	FUKIEN
469	1827	3	23	34.9 N	111.1 E	5.25	6.5	SHANSI
470	1829	4		37.5 N	111.2 E	5.25	6.5	SHANSI
471	1829	8	18	34.6 N	110.6 E	5.	6.	HONAN
472	1829	11	18	33.2 N	117.9 E	5.5	7.	ANHWEI
473	1829	11	19	36.6 N	118.5 E	6.	8.	SHANTUNG
474	1830	6	12	36.4 N	114.2 E	7.5	10.	HOPEH
475	1831			35.9 N	117.8 E	5.	6.	SHANTUNG
476	1831	9	28	32.8 N	116.9 E	6.25	8.	ANHWEI *
477	1832	8		39.9 N	96.9 E	6.5	8.	KANSU *
478	1833	9	6	25.2 N	103.0 E	8.	11.	YUNNAN
479	1833	12	13	24.7 N	121.8 E	5.	6.	TAIWAN
480	1834	4	11	24.9 N	103.0 E	5.	6.	YUNNAN
481	1835	6	6	36.3 N	116.4 E	5.	6.	SHANTUNG
482	1837	9	15?	34.6 N	103.7 E	6.	8.	KANSU
483	1839	2	7	26.1 N	100.0 E	6.	8.	YUNNAN
484	1839	2	23	26.1 N	100.0 E	6.	7.5	YUNNAN
485	1839	6	27	23.4 N	120.4 E	6.5	8.	TAIWAN
486	1840	11		23.8 N	120.5 E	5.	6.	TAIWAN
487	1842	6	11	43.6 N	93.0 E	6.	8.	SINKIANG
488	1845	2		24.1 N	120.5 E	6.	8.	TAIWAN
489	1845	11	3	26.0 N	100.0 E	5.5	7.	YUNNAN
490	1846			31.6 N	106.0 E	5.5	7.	SZECHWAN
491	1847	3		34.8 N	111.8 E	5.	6.	HONAN
492	1848	12	3	24.1 N	120.5 E	6.75	9.	TAIWAN
493	1850			34.7 N	104.9 E	5.	6.	KANSU
494	1850	9	12	27.8 N	102.3 E	7.5	10.	SZECHWAN
495	1852	5	26	37.5 N	105.2 E	6.	8.	NINGSIA
496	1853	2	8	25.2 N	111.6 E	5.	6.	HUNAN
497	1853	11		39.0 N	76.2 E	5.5	7.	SINKIANG
498	1854	11	24	29.1 N	107.1 E	5.5	7.	SZECHWAN
499	1855	2	27	30.1 N	120.0 E	5.	6.	CHEKIANG
500	1855	9?		29.2 N	108.1 E	5.	6.	SZECHWAN
501	1855	12	11	39.1 N	121.7 E	5.5	7.	LIAONING
502	1856	4	10	39.1 N	121.7 E	5.25	6.5	LIAONING
503	1856	6	10	29.7 N	108.8 E	5.5	7.	SZECHWAN
504	1857	1	29	22.7 N	110.3 E	4.75	6.	KWANGSI
505	1859	9	19	40.7 N	122.2 E	5.	6.	LIAONING
506	1861	7		24.3 N	102.9 E	4.75	6.	YUNNAN
507	1861	7	19	39.1 N	121.7 E	6.	8.	LIAONING
508	1862	2		25.7 N	100.2 E	5.5	7.	YUNNAN
509	1862	6	6	23.3 N	120.3 E	6.5	8.	TAIWAN
510	1862	12	23	35.5 N	111.5 E	5.5	7.	SHANSI
511	1863	6		26.0 N	100.1 E	5.5	7.	YUNNAN
512	1863	8	30	29.2 N	114.1 E	5.	6.	HUPEH
513	1866	9	21	28.0 N	119.6 E	5.	6.	CHEKIANG
514	1867	9		30.5 N	120.8 E	5.	6.	CHEKIANG
515	1867	12	18	25.5 N	121.7 E	6.		TAIWAN
516	1868	10	30	32.4 N	117.8 E	5.5	6.5	ANHWEI
517	1870			22.4 N	120.6 E	5.5	7.	TAIWAN
518	1870	4	11	30.0 N	99.0 E	6.75	9.	SZECHWAN
519	1870	7	5	24.0 N	102.0 E	5.	6.5	YUNNAN
520	1874	7		23.0 N	115.4 E	5.	6.	KWANGTU.
521	1875	6		26.3 N	109.3 E	5.	6.	KWEICHOW
522	1876	8	5	25.4 N	99.4 E	6.	7.5	YUNNAN
523	1877	10		25.5 N	102.4 E	4.75	6.	YUNNAN
524	1878	8	7	27.7 N	100.7 E	5.5	7.	YUNNAN
525	1879	5	12	31.8 N	104.8 E	5.	6.	SZECHWAN
526	1879	7	1	33.2 N	104.7 E	7.5	10.	KANSU
527	1879	11	23	24.6 N	98.7 E	5.	6.	YUNNAN
528	1879	12?		24.4 N	103.4 E	5.5	7.	YUNNAN
529	1880	9	30	39.7 N	118.7 E	5.	6.	HOPEH
530	1881	2	18	24.5 N	120.7 E	5.5	7.	TAIWAN
531	1881	7	20	33.6 N	104.6 E	6.5	8.	KANSU
532	1882	1		24.4 N	103.4 E	5.75	7.	YUNNAN
533	1882	12	2	38.1 N	115.5 E	6.	8.	HOPEH
534	1882	12	9	23.8 N	120.5 E ?	6.25	7.5	TAIWAN
535	1884	11	14	23.0 N	101.1 E	6.5	8.	YUNNAN
536	1885	1	14	34.5 N	105.7 E	6.	7.5	KANSU
537	1885	2	21	40.7 N	122.2 E	5.	6.	LIAONING
538	1886	1	13	23.4 N	116.7 E	5.	6.	KWANGTU.
539	1887	4	8	24.0 N	116.8 E	5.	6.	KWANGTU.
540	1887	7		37.0 N	103.8 E	5.	6.	KANSU
541	1887	12	16	23.7 N	102.5 E	6.75	9.	YUNNAN
542	1888	6	13	38.5 N	119.0 E	7.5		SHANTUNG
543	1888	11	2	37.1 N	104.2 E	6.25	8.	KANSU
544	1889	9		38.1 N	106.3 E	5.	6.5	NINGSIA
545	1889	10		36.3 N	115.1 E	5.	6.	HOPEH
546	1890			36.9 N	112.9 E	5.5	7.	SHANSI
547	1890	2	17	36.6 N	101.8 E	5.	6.	TSINGHAI
548	1890	4	22	26.5 N	99.9 E	5.5	6.5	YUNNAN
549	1890	10	6	27.3 N	100.3 E	5.	6.	YUNNAN
550	1891	4	17	37.0 N	111.9 E	5.75	7.	SHANSI
551	1892	2	10	28.9 N	105.0 E	5.	6.	SZECHWAN
552	1893	2	23	38.3 N	116.8 E	5.	6.	HOPEH
553	1893	4		25.6 N	102.4 E	5.	6.	YUNNAN
554	1893	6	1	36.6 N	101.8 E	5.5	7.	TSINGHAI
555	1893	8	29	30.5 N	101.5 E	6.	8.	SZECHWAN
556	1893	11	26	22.7 N	107.8 E	5.	6.	KWANGSI
557	1893	12	17	41.7 N	82.8 E	5.5	7.	SINKIANG
558	1895	2		25.0 N	114.0 E	4.75	6.	KWANGTU.
559	1895	7	5	37.7 N	75.1 E	6.	8.	SINKIANG
560	1895	7	11	25.3 N	100.3 E	4.75	5.5	YUNNAN
561	1895	8	30	23.5 N	116.3 E	5.75	7.5	KWANGTU.
562	1896	2	12	26.8 N	100.2 E	5.5	7.	YUNNAN
563	1896	2	14	29.2 N	104.9 E	5.75	7.	SZECHWAN
564	1898	6	21	39.5 N	76.0 E	5.5	7.	SINKIANG
565	1898	9	22	39.1 N	113.0 E	5.5	7.	SHANSI
566	1899	11		23.6 N	109.6 E	5.	6.	KWANGSI

become widespread in China until about 1000 A.D. so that very few old documents (written before 1000 A.D.) exist. The accuracy of the Chinese dynasty records may be subject to debate. Earthquakes, like other disasters or unusual phenomena such as eclipses, were often regarded as punishments to the emperor and/or the people for their sins. As a result, the record of their occurrence could have been misrepresented by court historians.

Another consideration is that ancient China does not cover as much territory as modern China. Earthquakes could have been recorded only within the territory that was under the control of the dynasty, and could have been noticed only if there were a sufficient

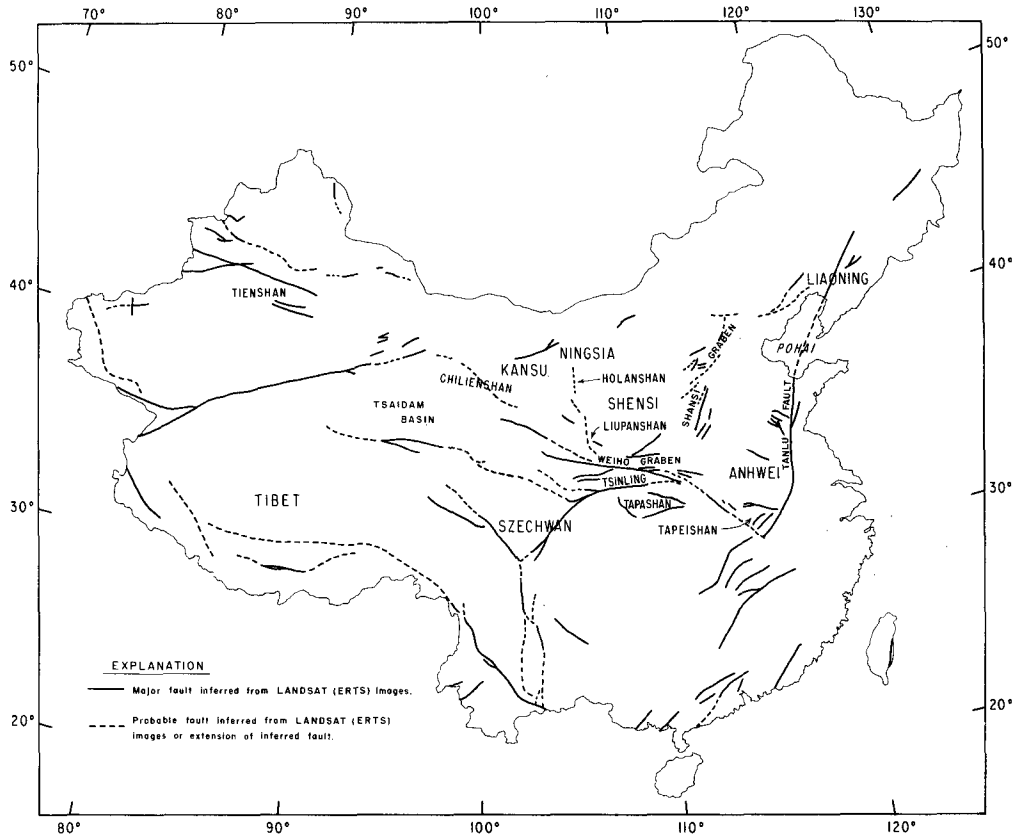

FIG. 2. Simplified fault map of China based on LANDSAT (ERTS) images using Albers equal-area projection. Since not all faults can be identified by this method, this fault map is not complete.

number of people living near the epicentral region. Consequently, one would expect fewer and fewer earthquake reports as one goes back in time.

The dynastic records and some ancient records appear to have been fairly well preserved. Recent editions of dynastic records indicate only minor discrepancies among different older versions, and small parts may be missing (but were mostly filled in from other sources that quoted the missing text). Although many documents written before 1000 A.D. perished, the lengthy dynasty records going back over 2,000 years should have recorded most of the destructive earthquakes.

Another important reason that fewer ancient earthquakes are listed in Table 1 is that many historical earthquakes (especially ancient ones) could not be interpreted and

TABLE 2

Chinese Historical Earthquakes Listed Chronologically by Province

PROVINCE : ANHWEI

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE	
1	294	7		32.6 N	116.8 E	5.5	7.	ANHWEI	
2	1425	3	7	31.7 N	116.5 E	5.75	7.	ANHWEI	
3	1537	5	13	33.6 N	117.6 E	5.5	7.	ANHWEI	
4	1585	3	6	31.2 N	117.7 E	6.	7.	ANHWEI	*
5	1652	2	10	31.4 N	116.3 E	5.	6.	ANHWEI	
6	1652	3	23	31.5 N	116.5 E	6.	7.5	ANHWEI	
7	1673	3	29	31.8 N	117.3 E	5.	6.	ANHWEI	
8	1743	6	29	30.7 N	118.4 E	5.5	7.	ANHWEI	
9	1829	11	18	33.2 N	117.9 E	5.5	7.	ANHWEI	
10	1831	9	28	32.8 N	116.9 E	6.25	8.	ANHWEI	*
11	1863	10	30	32.4 N	117.8 E	5.5	6.5	ANHWEI	

PROVINCE : CHEKIANG

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	1213	6	26	29.6 N	119.0 E	4.75	6.	CHEKIANG
2	1523	8	14	30.0 N	122.1 E	5.5	7.	CHEKIANG
3	1574			27.6 N	119.1 E	5.5	7.	CHEKIANG
4	1813	10	17	28.0 N	120.7 E	4.75	5.5	CHEKIANG
5	1855	2	27	30.1 N	120.0 E	5.	6.	CHEKIANG
6	1866	9	21	28.0 N	119.6 E	5.	6.	CHEKIANG
7	1867	9		30.5 N	120.8 E	5.	6.	CHEKIANG

PROVINCE : FUKIEN

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	1445	12	12	24.6 N	117.6 E	6.0	7.5	FUKIEN
2	1516	9		25.1 N	118.2 E	4.75	6.	FUKIEN
3	1519	9		23.7 N	117.2 E	4.75	6.	FUKIEN
4	1520	5		25.2 N	116.2 E	4.75	6.	FUKIEN
5	1535	5		25.8 N	116.4 E	4.5		FUKIEN
6	1574	8	19	26.1 N	119.3 E	5.75	7.	FUKIEN
7	1596	10		25.0 N	118.7 E	4.75	6.	FUKIEN
8	1604	12	29	25.0 N	119.5 E	8.		FUKIEN
9	1651	2	15	26.2 N	116.6 E	5.5	7.	FUKIEN
10	1791	4	8	24.5 N	117.7 E	5.5	6.5	FUKIEN
11	1825	10		25.9 N	119.0 E	5.	6.	FUKIEN

PROVINCE : HONAN

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE	
1	46	10	23	33.0 N	112.5 E	6.5	8.	HONAN	
2	1502	10	17	35.7 N	115.3 E	6.5	8.	HONAN	*
3	1522	1	28	34.2 N	114.1 E	5.75	7.	HONAN	
4	1524	2	4	33.8 N	113.9 E	5.75	7.	HONAN	
5	1587	4	10	35.3 N	113.5 E	6.	7.	HONAN	
6	1623	12	26	36.0 N	115.1 E	4.75	6.	HONAN	
7	1640	4		34.7 N	112.5 E	5.	6.	HONAN	
8	1662	10	11	33.2 N	114.8 E	5.5	7.	HONAN	
9	1675			34.1 N	114.8 E	5.5	7.	HONAN	
10	1737	9	30	35.3 N	113.8 E	5.5	6.	HONAN	
11	1812	4	2	34.6 N	110.6 E	5.	6.	HONAN	
12	1814	2	4	35.8 N	114.4 E	5.25	7.	HONAN	
13	1820	8	3	34.1 N	113.9 E	6.	8.	HONAN	*
14	1820	10		34.8 N	111.2 E	5.	6.	HONAN	
15	1829	8	18	34.6 N	110.6 E	5.	6.	HONAN	
16	1847	3		34.8 N	111.8 E	5.	6.	HONAN	

PROVINCE : HOPEH

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	294	9		40.3 N	116.0 E	5.5	7.	HOPEH
2	344			36.3 N	114.5 E	5.5		HOPEH
3	777			37.8 N	115.2 E	6.0	8.	HOPEH
4	953	11		36.3 N	115.1 E	4.75	6.	HOPEH
5	1011	8		38.2 N	114.6 E	4.75	6.	HOPEH
6	1057			39.5 N	116.3 E ?	6.75	9.	HOPEH
7	1068	8	14	38.5 N	116.1 E	6.0	8.	HOPEH
8	1069	1	18	38.3 N	116.8 E	4.75	6.	HOPEH
9	1076	12		39.9 N	116.4 E	5.	6.	HOPEH
10	1214	10	5	36.5 N	113.8 E	6.0	8.	HOPEH
11	1322			40.6 N	115.0 E	4.5		HOPEH
12	1337	9	8	40.4 N	115.7 E ?	6.5	8.	HOPEH
13	1338	8	2	40.4 N	115.2 E	5.	6.	HOPEH
14	1484	1	29	40.4 N	116.1 E	6.75	8.5	HOPEH
15	1495	5	27	40.2 N	118.0 E	5.	6.	HOPEH
16	1527			39.8 N	118.1 E	5.5	7.	HOPEH
17	1529	6?		37.9 N	114.7 E	5.	6.	HOPEH
18	1532	11	6	39.9 N	116.9 E	5.5	7.	HOPEH
19	1536	10	22	39.8 N	116.8 E	6.	7.5	HOPEH
20	1539			38.0 N	115.6 E	5.	6.	HOPEH
21	1562	6		39.7 N	118.7 E	5.	6.	HOPEH
22	1567			39.7 N	119.2 E	4.75	6.	HOPEH
23	1568	4	25	39.0 N	119.0 E	6.		HOPEH
24	1578	7	17	40.4 N	115.7 E	5.	6.	HOPEH
25	1581	5	18	39.8 N	114.5 E	6.	7.5	HOPEH
26	1586	5	26	39.9 N	116.3 E	5.	6.	HOPEH
27	1616	10	10	40.9 N	116.0 E	5.	6.	HOPEH
28	1618	11	16	39.8 N	114.5 E	6.	7.5	HOPEH
29	1621	3		39.4 N	116.8 E	5.5	7.	HOPEH
30	1624	4	17	39.7 N	118.7 E	6.25	8.	HOPEH
31	1624	7	19	38.8 N	115.5 E	5.5	7.	HOPEH

PROVINCE : HOPEH (CONTINUED)

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
32	1625	4		38.3 N	116.8 E	5.	6.	HOPEH
33	1658	2	3	39.4 N	115.7 E	6.	7.5	HOPEH
34	1664	4	1	39.9 N	116.7 E	4.75	6.	HOPEH
35	1665	4	16	39.9 N	116.7 E	6.5	8.	HOPEH
36	1678	6?		40.7 N	115.3 E	5.	6.	HOPEH
37	1679	9	2	40.0 N	117.0 E	8.	11.	HOPEH
38	1704	9	18	38.0 N	116.5 E	5.5	7.	HOPEH
39	1709	10	26	36.7 N	114.7 E	5.5	7.	HOPEH
40	1720	7	12	40.4 N	115.5 E	6.75	9.	HOPEH
41	1724			40.4 N	115.2 E	5.	6.	HOPEH
42	1730	9	30	40.0 N	116.2 E	6.5	8.	HOPEH
43	1746	7	29	40.2 N	116.2 E	5.	6.	HOPEH
44	1772	3	1	38.3 N	114.4 E	5.	6.	HOPEH
45	1791	2	11	38.0 N	115.5 E	5.	6.	HOPEH
46	1795	8	5	39.7 N	118.7 E	5.25	6.5	HOPEH
47	1805	6	25	37.1 N	114.5 E	5.	6.	HOPEH
48	1805	8	5	39.7 N	119.2 E	5.5	7.	HOPEH
49	1815	8	6	39.0 N	117.5 E	5.	6.	HOPEH
50	1830	6	12	36.4 N	114.2 E	7.5	10.	HOPEH
51	1880	9	30	39.7 N	118.7 E	5.	6.	HOPEH
52	1882	12	2	38.1 N	115.5 E	6.	8.	HOPEH
53	1889	10		36.3 N	115.1 E	5.	6.	HOPEH
54	1893	2	23	38.3 N	116.8 E	5.	6.	HOPEH

PROVINCE : HUNAN

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	1509			28.6 N	112.4 E	4.75	6.	HUNAN
2	1556	1		29.4 N	113.1 E	5.5	7.	HUNAN
3	1626	10	8	26.9 N	109.7 E	5.	6.	HUNAN
4	1631	8	14	29.2 N	111.7 E	6.5	8.	HUNAN
5	1631	9	1	28.3 N	110.2 E	5.	6.	HUNAN
6	1710	4	16	27.8 N	111.3 E	5.5	7.	HUNAN
7	1782	4	30	26.2 N	111.7 E	5.	6.	HUNAN
8	1786			29.1 N	110.4 E	5.	6.	HUNAN
9	1853	2	8	25.2 N	111.6 E	5.	6.	HUNAN

PROVINCE : HUPEH

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	-159	6		32.2 N	110.4 E	5.	6.	HUPEH
2	-154			32.2 N	110.4 E	5.	6.	HUPEH
3	-142?			32.2 N	110.4 E	5.	6.	HUPEH
4	1336	3?		30.1 N	115.9 E	4.7	6.	HUPEH
5	1407	11		31.2 N	112.6 E	5.5	7.	HUPEH
6	1433			30.5 N	115.2 E	4.75	6.	HUPEH
7	1469	11	4	31.2 N	112.6 E	5.	6.5	HUPEH
8	1584	3	6	30.8 N	115.7 E	5.5	7.	HUPEH
9	1603	5	30	31.2 N	112.6 E	5.	6.	HUPEH
10	1630			30.7 N	113.5 E	5.	6.	HUPEH
11	1630	10	14	30.4 N	113.5 E	5.	6.	HUPEH
12	1633			32.4 N	109.7 E	5.	6.	HUPEH
13	1634	3		30.7 N	115.1 E	5.5	6.5	HUPEH
14	1640	9		30.4 N	114.9 E	5.	6.	HUPEH
15	1742			32.0 N	110.8 E	5.	6.	HUPEH
16	1863	8	30	29.2 N	114.1 E	5.	6.	HUPEH

PROVINCE : KANSU

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	-193	2		35.4 N	103.9 E	6.5		KANSU
2	-186	2	22	33.4 N	104.8 E	6.5		KANSU
3	- 47	4	17	35.1 N	104.6 E	6.75	9.	KANSU
4	128	2	23	34.7 N	105.4 E	6.5	8.	KANSU
5	138	3	1	35.5 N	104.0 E	6.75	9.	KANSU
6	143	10		34.7 N	105.3 E ?	7.0	9.	KANSU
7	180	9?		39.4 N	99.5 E	7.5	10.	KANSU
8	319	6	17	34.0 N	105.2 E	4.5		KANSU
9	406	6		36.3 N	104.5 E	5.5		KANSU
10	409			39.0 N	100.5 E	4.75	6.	KANSU
11	416			34.3 N	105.5 E	5.	6.	KANSU
12	506	8	30	37.9 N	102.6 E	4.75	6.	KANSU
13	575	1	14	37.9 N	102.6 E	5.5	7.	KANSU
14	734	3	19	34.7 N	106.3 E	7.0	9.	KANSU
15	756	11	27	39.0 N	100.5 E	6.0	7.	KANSU
16	839			34.4 N	104.0 E	6.5		KANSU
17	1092	12?		37.9 N	102.6 E	4.75	6.	KANSU
18	1125	8	30	36.0 N	103.9 E	7.0	9.	KANSU
19	1352	4	18	35.6 N	105.3 E ?	7.0	9.	KANSU
20	1440	10	26	36.2 N	103.4 E	6.25	8.	KANSU
21	1477	3	19	35.2 N	104.2 E	5.	6.	KANSU
22	1542	11	19	34.7 N	104.9 E	5.	6.	KANSU
23	1556	12	3	38.8 N	101.1 E	5.	6.	KANSU
24	1561	2	21	38.8 N	101.1 E	5.	6.	KANSU
25	1573	1	10	34.4 N	104.0 E	6.75	8.5	KANSU
26	1581	7		33.0 N	104.6 E	5.5	7.	KANSU
27	1590	7	7	35.4 N	103.9 E	5.5	7.	KANSU
28	1591	11	21	38.8 N	101.1 E	5.	6.	KANSU
29	1604	10	25	34.2 N	105.0 E	6.	7.5	KANSU
30	1609	7	11	39.2 N	99.0 E	6.75	9.	KANSU
31	1624	7	4	35.4 N	105.9 E	6.	7.5	KANSU
32	1628	12?		33.0 N	104.6 E	5.5	7.	KANSU

TABLE 2—*Continued*

PROVINCE : KANSU (CONTINUED)

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
33	1629	3		36.0 N	103.9 E	5.	6.	KANSU
34	1631			33.7 N	106.2 E	5.	6.	KANSU
35	1631	7		35.5 N	107.8 E	5.	6.	KANSU
36	1631	7	21	35.3 N	104.3 E	5.	6.	KANSU
37	1634	1		34.0 N	105.2 E	6.	7.5	KANSU
38	1634	12		35.1 N	107.7 E	5.5	7.	KANSU
39	1641	6	21	34.3 N	105.5 E	4.75	6.	KANSU
40	1652	8		33.4 N	104.8 E	5.5	7.	KANSU
41	1654	7	21	34.3 N	105.5 E	7.5	10.	KANSU
42	1665			37.9 N	102.6 E	5.	6.	KANSU
43	1677	9		33.4 N	104.8 E	5.5	7.	KANSU
44	1699	9?		39.8 N	99.7 E	4.75	6.	KANSU
45	1719	6	19	35.0 N	105.2 E	7.5	10.	KANSU
46	1765	5	1	35.3 N	103.9 E	5.25	7.	KANSU
47	1765	9	2	34.8 N	105.0 E	6.5	8.5	KANSU
48	1785	4	18	39.9 N	98.0 E	6.	7.5	KANSU
49	1922	6	18	33.0 N	104.6 E	5.5	7.	KANSU
50	1932	8		39.9 N	96.9 E	6.5	8.	KANSU *
51	1937	9	15?	34.6 N	103.7 E	6.	8.	KANSU
52	1850			34.7 N	104.9 E	5.	6.	KANSU
53	1879	7	1	33.2 N	104.7 E	7.5	10.	KANSU
54	1881	7	20	33.6 N	104.6 E	6.5	8.	KANSU
55	1885	1	14	34.5 N	105.7 E	6.	7.5	KANSU
56	1987	7		37.0 N	103.8 E	5.	6.	KANSU
57	1988	11	2	37.1 N	104.2 E	6.25	8.	KANSU

PROVINCE : KIANGSI

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	1361	9?		28.8 N	115.3 E	5.	6.	KIANGSI
2	1562			25.8 N	116.0 E	5.	6.	KIANGSI
3	1710			28.5 N	117.6 E	4.75	6.	KIANGSI
4	1792	4		27.4 N	114.6 E	5.	6.	KIANGSI
5	1804	12?		24.9 N	115.6 E	5.	6.	KIANGSI
6	1906	1	11	25.3 N	115.7 E	6.	7.5	KIANGSI

PROVINCE : KIANGSU

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	393	10		31.8 N	119.9 E	5.5	7.	KIANGSU
2	1372	8	16	32.0 N	118.8 E	4.75	6.	KIANGSU
3	1399	4	29	32.0 N	118.8 E	4.75	6.	KIANGSU
4	1615	3	1	32.0 N	120.9 E	5.	6.	KIANGSU
5	1621	12?		31.0 N	120.7 E	5.	6.	KIANGSU
6	1624	2	10	32.5 N	119.5 E	6.	7.	KIANGSU
7	1624	9	1	31.1 N	121.4 E	5.	6.	KIANGSU
8	1642			33.0 N	118.4 E	5.	6.	KIANGSU
9	1662			33.4 N	120.1 E	4.75	6.	KIANGSU
10	1731	11		31.4 N	121.0 E	5.	6.	KIANGSU

PROVINCE : KWANGSI

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	1578	2	17	25.1 N	110.2 E	4.75	6.	KWANGSI
2	1589			24.8 N	110.5 E	4.75	6.	KWANGSI
3	1593	8		25.5 N	110.4 E	4.75	6.	KWANGSI
4	1751	3		23.8 N	106.9 E	4.75	6.	KWANGSI
5	1857	1	29	22.7 N	110.3 E	4.75	6.	KWANGSI
6	1893	11	26	22.7 N	107.8 E	5.	6.	KWANGSI
7	1893	11		23.6 N	109.6 E	5.	6.	KWANGSI

PROVINCE : KWANGTUNG

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	1067	11		23.6 N	116.5 E	6.75	9.	KWANGTUN
2	1372	9	17	23.1 N	113.3 E	4.75	6.	KWANGTUN
3	1445			23.4 N	112.6 E	4.75	6.	KWANGTUN
4	1524	4	5	19.2 N	110.5 E	5.	6.	KWANGTUN
5	1558	6		23.4 N	111.5 E	5.5	7.	KWANGTUN
6	1571	5	26	23.9 N	113.5 E	5.	6.	KWANGTUN
7	1600	7		21.6 N	110.3 E	4.75	6.	KWANGTUN
8	1600	9	29	23.5 N	117.0 E	7.	9.	KWANGTUN
9	1605	7	13	19.9 N	110.5 E	7.5	10.	KWANGTUN
10	1611			21.4 N	111.0 E	5.	6.	KWANGTUN
11	1618			19.7 N	110.0 E	5.	6.	KWANGTUN
12	1641	11	26	23.6 N	116.5 E	5.75	7.	KWANGTUN
13	1653	8	12	21.7 N	110.2 E	5.	5.5	KWANGTUN
14	1656	3		22.8 N	113.0 E	4.75	6.	KWANGTUN
15	1683	10	10	23.0 N	113.2 E	5.	6.	KWANGTUN
16	1693	4	25	23.0 N	115.4 E	5.	6.	KWANGTUN
17	1791	3		23.5 N	116.7 E	5.	6.	KWANGTUN
18	1874	7		23.0 N	115.4 E	5.	6.	KWANGTUN
19	1886	1	13	23.4 N	116.7 E	5.	6.	KWANGTUN
20	1887	4	8	24.0 N	116.8 E	5.	6.	KWANGTUN
21	1895	2		25.0 N	114.0 E	4.75	6.	KWANGTUN
22	1895	8	30	23.5 N	116.3 E	5.75	7.5	KWANGTUN

PROVINCE : KWEICHOW

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	1526	5	21	25.8 N	105.2 E	5.	6.	KWEICHOW
2	1526	5	30	25.8 N	105.2 E	5.	6.	KWEICHOW

PROVINCE : KWEICHOW (CONTINUED)

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
3	1551	6?		25.8 N	105.2 E	5.	6.	KWEICHOW
4	1602	6?		25.8 N	105.2 E	4.75	6.	KWEICHOW
5	1631	9		25.8 N	105.2 E	4.75	6.	KWEICHOW
6	1813	9	14	26.5 N	107.2 E	5.75	6.5	KWEICHOW
7	1875	6		26.3 N	109.3 E	5.	6.	KWEICHOW

PROVINCE : LIAONING

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	421			41.6 N	120.4 E	5.	6.	LIAONING
2	1290	9	27	41.5 N	119.3 E	6.75	9.	LIAONING *
3	1594	10	24	42.6 N	124.0 E	5.	6.	LIAONING
4	1698			41.5 N	121.2 E	5.	6.	LIAONING
5	1765	3	15	41.8 N	123.4 E	5.5	7.	LIAONING
6	1855	12	11	39.1 N	121.7 E	5.5	7.	LIAONING
7	1856	4	10	39.1 N	121.7 E	5.25	6.5	LIAONING
8	1859	9	19	40.7 N	122.2 E	5.	6.	LIAONING
9	1861	7	19	39.1 N	121.7 E	6.	8.	LIAONING
10	1885	2	21	40.7 N	122.2 E	5.	6.	LIAONING

PROVINCE : NINGSIA

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	876	7	14	37.8 N	105.9 E	6.5	8.	NINGSIA
2	1010	11		38.1 N	106.4 E	5.5	7.	NINGSIA
3	1143	4		38.5 N	106.3 E	6.5	8.	NINGSIA
4	1219	5	21	36.0 N	106.2 E	6.5	8.5	NINGSIA
5	1306	9	12	35.9 N	106.1 E	6.5	8.5	NINGSIA
6	1373	4	30	38.5 N	106.3 E	5.75	7.	NINGSIA
7	1474	12	11	38.0 N	106.3 E	5.5	7.	NINGSIA
8	1477	5	13	38.5 N	106.3 E	6.5	8.	NINGSIA
9	1495	4	10	37.6 N	105.6 E	6.25	8.	NINGSIA
10	1505	7	10	37.8 N	105.9 E	5.5	7.	NINGSIA
11	1561	7	25	37.4 N	106.0 E	7.25	9.5	NINGSIA
12	1562			38.5 N	106.3 E	5.	6.	NINGSIA
13	1568	4	1	38.5 N	106.3 E	5.75	7.	NINGSIA
14	1608	9	23	37.5 N	105.7 E	5.5	7.	NINGSIA
15	1615	7	20	38.8 N	106.3 E	5.5	7.	NINGSIA
16	1616	2	10	37.8 N	105.9 E	5.75	7.	NINGSIA
17	1622	10	25	36.5 N	106.3 E	7.	9.5	NINGSIA
18	1627	2	16	37.5 N	105.5 E	6.	8.	NINGSIA
19	1639	1		36.6 N	105.7 E	5.5	7.	NINGSIA
20	1686			37.1 N	106.4 E	5.	6.	NINGSIA
21	1709	10	14	37.4 N	105.3 E	7.5	9.5	NINGSIA
22	1739	1	3	38.9 N	106.5 E	8.	10.	NINGSIA
23	1739	2	13	38.5 N	106.3 E	5.5	7.	NINGSIA
24	1748	11	21	36.4 N	106.1 E	5.5	7.	NINGSIA
25	1852	5	26	37.5 N	105.2 E	6.	8.	NINGSIA
26	1881	9		38.1 N	106.3 E	5.	6.5	NINGSIA

PROVINCE : SHANSI

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	-231			36.5 N	111.5 E	6.5	8.	SHANSI
2	512	5	21	39.0 N	113.0 E	7.5	10.	SHANSI
3	649	3	12	36.1 N	111.5 E	5.5	7.	SHANSI
4	865	12		35.9 N	111.4 E	5.5	7.	SHANSI
5	867	2	14	35.9 N	111.4 E	5.5	7.	SHANSI
6	1022	4		39.7 N	113.1 E	6.5	8.	SHANSI
7	1033	1	9	38.4 N	112.9 E	7.25	10.	SHANSI
8	1209	12	04	36.0 N	111.8 E	6.5	8.5	SHANSI
9	1291	8	25	36.1 N	111.5 E	6.5	8.	SHANSI
10	1303	9	17	36.3 N	111.7 E	8.0	11.	SHANSI
11	1304	2		36.1 N	111.5 E	5.5	7.	SHANSI
12	1304	9	3	37.5 N	112.6 E	4.75	6.	SHANSI
13	1305	5	3	39.8 N	113.1 E	6.5	8.5	SHANSI
14	1316			36.4 N	111.1 E	5.5	7.	SHANSI
15	1342	5	5	37.9 N	112.6 E	5.5	7.	SHANSI
16	1351	5	14	37.3 N	113.0 E ?	5.5	7.	SHANSI
17	1368	7	8	37.6 N	112.5 E	6.0	7.	SHANSI
18	1467	6	9	39.6 N	112.3 E	5.5	7.	SHANSI
19	1485	1	17	34.8 N	110.4 E	5.	6.5	SHANSI
20	1497	2	17	36.3 N	112.9 E	4.75	6.	SHANSI
21	1505	10	16	35.3 N	110.8 E	5.	6.	SHANSI
22	1542			39.0 N	111.0 E	5.	6.	SHANSI
23	1549	6		37.0 N	111.9 E	5.	6.	SHANSI
24	1553	6		37.5 N	112.2 E	5.	6.	SHANSI
25	1580	9	5	39.5 N	112.3 E	5.5	7.	SHANSI
26	1582	3		40.1 N	113.2 E	5.	6.	SHANSI
27	1583	5	18	39.7 N	113.9 E ?	5.5	7.	SHANSI
28	1584	4		38.4 N	111.9 E	4.75	6.	SHANSI
29	1587	10	4	35.2 N	110.8 E	5.	6.	SHANSI
30	1588	8		38.4 N	112.8 E	5.	6.	SHANSI
31	1614	10	23	37.2 N	112.5 E	6.	7.5	SHANSI
32	1618	5	20	37.0 N	111.9 E	6.5	8.	SHANSI
33	1624	3?		38.4 N	112.8 E	5.	6.	SHANSI
34	1626	6	28	39.4 N	114.2 E	7.	9.	SHANSI
35	1627	6?		37.6 N	113.7 E	5.5	7.	SHANSI
36	1633			37.3 N	111.8 E	5.	6.	SHANSI
37	1642	6	30	34.9 N	111.1 E	6.	8.	SHANSI
38	1664			38.7 N	112.7 E	5.5	7.	SHANSI
39	1673	10	18	40.5 N	114.1 E	5.5	7.	SHANSI

TABLE 2—*Continued*

TABLE 2—*Continued*

PROVINCE : SHANSI (CONTINUED)

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
40	1673	10	18	39.0 N	111.0 E	5.5	6.5	SHANSI
41	1675	6		34.8 N	111.1 E	4.75	6.	SHANSI
42	1679	10		37.5 N	112.5 E	5.5	7.	SHANSI
43	1683	11	22	38.7 N	112.7 E	7.	9.	SHANSI
44	1695	5	18	36.0 N	111.5 E	8.	10.	SHANSI
45	1754	5		37.7 N	112.5 E	5.	6.	SHANSI
46	1813			36.0 N	111.4 E	5.25	6.5	SHANSI
47	1815	10	23	34.8 N	111.2 E	6.75	9.	SHANSI
48	1827	3	23	34.9 N	111.1 E	5.25	6.5	SHANSI
49	1829	4		37.5 N	111.2 E	5.25	6.5	SHANSI
50	1862	12	23	35.5 N	111.5 E	5.5	7.	SHANSI
51	1890			36.9 N	112.9 E	5.5	7.	SHANSI
52	1891	4	17	37.0 N	111.9 E	5.75	7.	SHANSI
53	1898	9	22	39.1 N	113.0 E	5.5	7.	SHANSI

PROVINCE : SHANTUNG

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	- 70	6	1	36.3 N	119.0 E	7.0	9.	SHANTUNG
2	408			36.8 N	118.3 E	5.	6.5	SHANTUNG
3	462	8	16	35.6 N	116.8 E	5.5		SHANTUNG
4	495	3	31	37.5 N	121.2 E	5.5	7.	SHANTUNG
5	692	3?		37.5 N	117.5 E	5.	6.	SHANTUNG
6	1046	4	18	37.8 N	120.7 E	5.	6.	SHANTUNG
7	1346	4		37.1 N	118.0 E	4.75	6.	SHANTUNG
8	1506	8	28	36.3 N	120.7 E	4.75	6.	SHANTUNG
9	1549	9	13	37.8 N	120.7 E	6.	8.	SHANTUNG
10	1620	10	19	37.1 N	117.5 E	4.75	6.	SHANTUNG
11	1622	3	18	35.5 N	116.0 E	6.	7.5	SHANTUNG
12	1622	4	17	36.6 N	116.8 E ?	5.5	7.	SHANTUNG
13	1654	9	15	36.1 N	115.6 E	5.5	7.	SHANTUNG
14	1668	7	25	35.3 N	118.6 E	8.5	12.	SHANTUNG
15	1671	9		35.3 N	118.0 E	5.	6.	SHANTUNG
16	1675	6		35.6 N	115.9 E	5.	6.	SHANTUNG
17	1730	12?		36.9 N	117.9 E	5.	6.5	SHANTUNG
18	1796	3		36.0 N	119.4 E	5.	6.	SHANTUNG
19	1829	11	19	36.6 N	118.5 E	6.	8.	SHANTUNG
20	1831			35.9 N	117.8 E	5.	6.	SHANTUNG
21	1835	6	6	36.3 N	116.4 E	5.	6.	SHANTUNG
22	1888	6	13	38.5 N	119.0 E	7.5		SHANTUNG

PROVINCE : SHENSI

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	-1177			34.5 N	107.8 E	4.5		SHENSI
2	-780			34.5 N	107.8 E ?	6.5		SHENSI
3	- 35	7		34.4 N	109.0 E	5.	6.5	SHENSI
4	600	12	13	34.3 N	108.9 E	5.5	7.	SHENSI
5	788	3	8	32.5 N	109.2 E	6.5	8.	SHENSI
6	793	5	27	34.5 N	109.7 E ?	6.0	7.5	SHENSI
7	835	4	11	34.3 N	108.9 E	4.75	6.	SHENSI
8	836	2	25	34.3 N	108.9 E	4.75	6.	SHENSI
9	879	3		34.2 N	109.3 E	4.75	6.	SHENSI
10	880	2		34.5 N	107.8 E	4.75	6.	SHENSI
11	1449	9	30	38.3 N	109.7 E	5.	6.5	SHENSI
12	1487	8	10	34.3 N	109.1 E	6.25	8.	SHENSI
13	1501	1	19	34.8 N	110.1 E	7.	9.	SHENSI
14	1502	1	17	34.8 N	110.1 E	5.	6.	SHENSI
15	1506	3	19	35.3 N	110.1 E	5.5	7.	SHENSI
16	1556	1	23	34.5 N	109.7 E	8.	11.	SHENSI
17	1559	11	21	34.5 N	109.7 E	5.5	7.	SHENSI
18	1568	1		34.2 N	109.3 E	5.	6.	SHENSI
19	1568	4	2	34.4 N	109.2 E	5.5	7.	SHENSI
20	1568	4	12	33.1 N	107.0 E	5.	6.	SHENSI
21	1569	5	15	34.4 N	109.0 E	6.75	9.	SHENSI
22	1569			34.6 N	110.3 E	5.	6.	SHENSI
23	1569			32.7 N	109.0 E	5.	6.	SHENSI
24	1591			36.6 N	110.2 E	5.	6.	SHENSI
25	1599			35.6 N	109.2 E	5.	6.	SHENSI
26	1621	5		39.1 N	110.9 E	5.	6.	SHENSI
27	1622	9		34.7 N	107.7 E	5.	6.	SHENSI
28	1624	9		33.2 N	107.5 E	5.5	7.	SHENSI
29	1635	10	26	33.2 N	107.5 E	5.5	7.	SHENSI
30	1636			37.0 N	108.9 E	4.75	6.	SHENSI
31	1636			33.1 N	107.0 E	5.5	7.	SHENSI
32	1653			33.1 N	107.0 E	5.	6.	SHENSI
33	1704	9	28	34.9 N	106.8 E	6.	7.5	SHENSI
34	1789	11	7	34.6 N	110.3 E	5.	6.	SHENSI
35	1823	8		32.5 N	107.9 E	5.	6.	SHENSI

PROVINCE : SINKIANG

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	1765	2	9	44.7 N	82.9 E	6.	7.5	SINKIANG
2	1786	6	18	44.0 N	80.8 E	6.	7.	SINKIANG
3	1812	3	8	43.7 N	83.0 E	7.5		SINKIANG
4	1842	6	11	43.6 N	93.0 E	6.	8.	SINKIANG
5	1853	11		39.0 N	76.2 E	5.5	7.	SINKIANG
6	1893	12	17	41.7 N	82.8 E	5.5	7.	SINKIANG
7	1895	7	5	37.7 N	75.1 E	6.	8.	SINKIANG
8	1898	6	21	39.5 N	76.0 E	5.5	7.	SINKIANG

PROVINCE : SZECHWAN

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	- 26			28.8 N	104.6 E	5.5	7.	SZECHWAN
2	625	8	15	27.9 N	102.3 E	4.75	6.	SZECHWAN
3	638	2	11	32.6 N	103.6 E	5.	6.	SZECHWAN
4	814	4	2	27.9 N	102.2 E	6.5		SZECHWAN
5	1169	1	24	31.9 N	104.4 E	4.75	6.	SZECHWAN
6	1216	3	17	28.3 N	103.6 E	6.5		SZECHWAN
7	1427			27.9 N	102.3 E	5.	6.5	SZECHWAN
8	1467	1	19	27.1 N	101.4 E	6.5	9.	SZECHWAN *
9	1478	8	17	27.5 N	101.6 E	5.5	7.	SZECHWAN
10	1489	9	15	31.7 N	103.9 E	5.5	6.5	SZECHWAN
11	1536	3	19	28.2 N	102.2 E	6.75	9.	SZECHWAN *
12	1597	2	14	31.9 N	104.3 E	5.	6.	SZECHWAN
13	1610	1	25	28.5 N	104.6 E	5.5	7.	SZECHWAN
14	1610	3	9	32.5 N	104.5 E	5.5	7.	SZECHWAN
15	1630	1	16	32.6 N	104.1 E	6.25	8.	SZECHWAN
16	1657	4	21	31.5 N	103.7 E	6.0	8.	SZECHWAN *
17	1713	9	4	32.0 N	103.7 E	6.5	8.	SZECHWAN
18	1725	7		30.0 N	102.0 E	5.5	7.	SZECHWAN
19	1732	1	29	27.7 N	102.2 E	6.	8.	SZECHWAN *
20	1734	3		30.3 N	103.5 E	5.	6.	SZECHWAN
21	1733	5	19	33.2 N	104.2 E	5.5	7.	SZECHWAN
22	1743	2	23	31.3 N	103.4 E	5.5	7.	SZECHWAN
23	1748	8	29	30.5 N	101.5 E	5.5	7.	SZECHWAN
24	1785	12?		30.5 N	101.5 E	5.	6.	SZECHWAN
25	1786	6	1	29.9 N	102.3 E	7.5	9.	SZECHWAN
26	1787	12	13	31.0 N	103.7 E	4.75	6.	SZECHWAN
27	1792	9	7	30.5 N	101.5 E	6.	8.	SZECHWAN
28	1792	11	30	30.5 N	101.5 E	5.5	7.	SZECHWAN
29	1793	5	15	30.5 N	101.5 E	6.	7.5	SZECHWAN
30	1811	9	27	31.7 N	100.3 E	6.	7.5	SZECHWAN
31	1846			31.6 N	106.0 E	5.5	7.	SZECHWAN
32	1850	9	12	27.8 N	102.3 E	7.5	10.	SZECHWAN
33	1854	11	24	29.1 N	107.1 E	5.5	7.	SZECHWAN
34	1855	9?		29.2 N	108.1 E	5.	6.	SZECHWAN
35	1856	6	10	29.7 N	108.8 E	5.5	7.	SZECHWAN
36	1870	4	11	30.0 N	99.0 E	6.75	9.	SZECHWAN
37	1879	5	12	31.8 N	104.8 E	5.	6.	SZECHWAN
38	1892	2	10	28.9 N	105.0 E	5.	6.	SZECHWAN
39	1893	8	29	30.5 N	101.5 E	6.	8.	SZECHWAN
40	1896	2	14	29.2 N	104.9 E	5.75	7.	SZECHWAN

PROVINCE : TAIWAN

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	1655			23.0 N	120.2 E	5.5	7.	TAIWAN
2	1661	2	15	23.0 N	120.2 E	6.	7.5	TAIWAN
3	1686	5	12	23.5 N	120.4 E	5.5	6.5	TAIWAN
4	1694	5		25.0 N	121.5 E	5.5	6.5	TAIWAN
5	1711	10	22	23.5 N	120.0 E	6.5	8.	TAIWAN
6	1721	1	5	23.0 N	120.3 E	6.	8.	TAIWAN
7	1736	1	30	23.1 N	120.3 E	6.	8.	TAIWAN
8	1776	12		23.5 N	120.5 E	5.5	7.	TAIWAN
9	1792	8	7	23.6 N	120.5 E	6.75	9.	TAIWAN
10	1797			23.0 N	120.2 E	5.	6.	TAIWAN
11	1811	3	18	25.2 N	121.3 E	6.5		TAIWAN
12	1815	7	11	24.7 N	121.8 E	5.5	7.	TAIWAN
13	1815	10	13	25.2 N	121.2 E	6.5	8.	TAIWAN
14	1816	3?		24.8 N	121.8 E	5.5	7.	TAIWAN
15	1833	12	13	24.7 N	121.8 E	5.	6.	TAIWAN
16	1839	6	27	23.4 N	120.4 E	6.5	8.	TAIWAN
17	1840	11		23.8 N	120.5 E	5.	6.	TAIWAN
18	1845	2		24.1 N	120.5 E	6.	8.	TAIWAN
19	1848	12	3	24.1 N	120.5 E	6.75	9.	TAIWAN
20	1862	6	6	23.3 N	120.3 E	6.5	8.	TAIWAN
21	1867	12	18	25.5 N	121.7 E	6.		TAIWAN
22	1870			22.4 N	120.6 E	5.5	7.	TAIWAN
23	1881	2	18	24.5 N	120.7 E	5.5	7.	TAIWAN
24	1882	12	9	23.8 N	120.5 E ?	6.25	7.5	TAIWAN

PROVINCE : TSINGHAI

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	373	8		36.6 N	101.8 E	4.75	6.	TSINGHAI
2	1590	7		36.5 N	102.7 E	5.	6.	TSINGHAI
3	1733			33.0 N	96.6 E	6.5	8.	TSINGHAI
4	1819	2	24	36.3 N	102.3 E	5.75	7.	TSINGHAI
5	1890	2	17	36.6 N	101.8 E	5.	6.	TSINGHAI
6	1893	6	1	36.6 N	101.8 E	5.5	7.	TSINGHAI

PROVINCE : YUNNAN

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
1	986			25.7 N	100.2 E	5.5	7.	YUNNAN
2	1111			25.7 N	100.2 E	5.	6.5	YUNNAN
3	1446			23.6 N	102.9 E	5.	6.5	YUNNAN
4	1458	8		25.1 N	99.2 E	5.	6.	YUNNAN
5	1474	10	27	26.5 N	100.1 E	5.5	7.	YUNNAN
6	1481	7	15	26.5 N	100.0 E	6.0	8.	YUNNAN
7	1489			25.7 N	101.3 E	4.75	6.	YUNNAN
8	1494	3	24	25.5 N	103.8 E	5.5	7.	YUNNAN
9	1499	11	14	26.1 N	100.0 E	4.75	6.	YUNNAN
10	1499	7	17	25.3 N	100.4 E	5.5	6.5	YUNNAN

TABLE 2—*Continued*

PROVINCE : YUNNAN (CONTINUED)

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
11	1500	1	4	24.9 N	103.1 E	6.75	9.	YUNNAN
12	1501	2	3	26.5 N	99.9 E	5.5	7.	YUNNAN
13	1506	4	27	25.4 N	103.3 E	5.5	7.	YUNNAN
14	1507	11	4	24.5 N	102.5 E	5.25	6.	YUNNAN
15	1511	5	12	25.0 N	101.5 E	5.5	7.	YUNNAN
16	1511	11	17	26.5 N	100.0 E	5.75	7.	YUNNAN
17	1512	10	8	25.0 N	98.7 E	6.5	8.	YUNNAN
18	1514	5	17	25.7 N	100.2 E	5.75	7.5	YUNNAN
19	1514	9	18	25.1 N	99.2 E	5.5	7.	YUNNAN
20	1515	6	17	26.6 N	100.8 E	7.5	10.	YUNNAN
21	1515	10	23	25.7 N	100.2 E	6.0	8.	YUNNAN
22	1517	7	12	24.1 N	102.6 E	5.5	7.	YUNNAN
23	1518	7	2	25.4 N	101.8 E	4.75	6.	YUNNAN
24	1519			25.7 N	100.2 E	5.	6.	YUNNAN
25	1520	3	26	25.3 N	100.3 E	5.5	7.	YUNNAN
26	1520	6	8	26.6 N	100.2 E	5.	6.	YUNNAN
27	1520	8	18	24.5 N	100.9 E	5.75	7.	YUNNAN
28	1539	8	8	23.6 N	102.8 E	5.5	6.5	YUNNAN
29	1560			24.1 N	102.7 E	5.5	7.	YUNNAN
30	1560	4		24.9 N	103.2 E	5.5	7.	YUNNAN
31	1571	9	9	24.1 N	102.7 E	6.	8.	YUNNAN
32	1572			25.5 N	103.8 E	5.	6.	YUNNAN
33	1577	3	13	25.0 N	98.6 E	6.5	8.	YUNNAN
34	1579	1		25.1 N	99.2 E	5.	6.	YUNNAN
35	1586	3		25.3 N	100.3 E	5.5	7.	YUNNAN
36	1588	1		25.0 N	98.6 E	5.5	7.	YUNNAN
37	1588	8	9	24.0 N	102.8 E	6.	8.	YUNNAN
38	1589	10	16	25.4 N	103.0 E	5.	6.	YUNNAN
39	1602	10		26.2 N	100.0 E	5.	6.	YUNNAN
40	1606	11	30	23.6 N	102.8 E	6.5	8.5	YUNNAN
41	1611	4		24.0 N	97.8 E	4.75	5.5	YUNNAN
42	1612	3	12	25.4 N	103.3 E	5.5	6.5	YUNNAN
43	1612	12		25.5 N	103.9 E	5.	6.	YUNNAN
44	1615	8	24	25.0 N	101.5 E	5.5	7.	YUNNAN
45	1619?			25.8 N	99.4 E	5.	6.	YUNNAN
46	1620	12		25.6 N	103.3 E	5.	6.5	YUNNAN
47	1623	5	4	25.5 N	100.5 E	6.	7.5	YUNNAN
48	1624	3	26	26.5 N	99.9 E	5.5	7.	YUNNAN
49	1624	7		26.9 N	100.2 E	5.	6.	YUNNAN
50	1642	12		25.5 N	101.3 E	5.	6.	YUNNAN
51	1643	12		25.9 N	101.1 E	5.5	7.	YUNNAN
52	1652	7	13	25.4 N	100.5 E	6.75	9.	YUNNAN
53	1655	4	17	24.4 N	102.5 E	5.	6.5	YUNNAN
54	1664	4		26.1 N	100.0 E	5.	6.	YUNNAN
55	1670	7		25.2 N	102.2 E	5.5	7.	YUNNAN
56	1677	12		25.5 N	101.3 E	5.5	7.	YUNNAN
57	1680	9	9	25.0 N	101.5 E	6.5	8.5	YUNNAN
58	1689	6	14	26.5 N	99.9 E	6.25	8.	YUNNAN
59	1692	9	12	24.5 N	103.8 E	5.5	7.	YUNNAN

PROVINCE : YUNNAN (CONTINUED)

NO.	YEAR	MO	DY	LAT	LONG	MAG	INT	PROVINCE
60	1701			25.2 N	102.5 E	5.75	7.	YUNNAN
61	1707	32		25.2 N	103.1 E	5.	6.	YUNNAN
62	1713	2	26	25.4 N	103.2 E	6.5	9.	YUNNAN
63	1722	2		24.1 N	102.5 E	5.	6.	YUNNAN
64	1722	3		25.1 N	102.0 E	5.	6.	YUNNAN
65	1725	1	8	25.1 N	103.1 E	6.	8.	YUNNAN
66	1729	9		25.6 N	100.3 E	5.	6.	YUNNAN
67	1732	11		23.7 N	102.5 E	5.	6.	YUNNAN
68	1733	8	2	26.2 N	103.1 E	6.75	9.	YUNNAN
69	1740	9		24.0 N	102.8 E	5.	6.5	YUNNAN
70	1750	9	15	24.7 N	102.9 E	5.5	7.	YUNNAN
71	1751			23.7 N	102.4 E	5.	6.	YUNNAN
72	1751	5	25	26.5 N	99.9 E	6.5	9.	YUNNAN
73	1754	4		25.0 N	101.5 E	5.	6.	YUNNAN
74	1755	1	27	24.7 N	102.2 E	6.5	8.	YUNNAN
75	1755	2	8	23.8 N	102.7 E	6.	8.	YUNNAN
76	1757	6	13	25.0 N	98.5 E	5.25	7.	YUNNAN
77	1761	5	23	24.4 N	102.5 E	6.	8.	YUNNAN
78	1761	11	3	24.4 N	102.5 E	6.	7.	YUNNAN
79	1763	12	30	24.3 N	102.8 E	6.5	8.	YUNNAN
80	1781	10	3	25.9 N	101.1 E	5.	6.	YUNNAN
81	1783			25.6 N	103.8 E	5.	6.5	YUNNAN
82	1785			25.0 N	98.5 E	5.	6.	YUNNAN
83	1786	7		25.0 N	98.5 E	5.	6.	YUNNAN
84	1789	6	7	24.2 N	102.8 E	6.5	9.	YUNNAN
85	1799	8	27	23.8 N	102.4 E	6.5	8.5	YUNNAN
86	1803	2	1	25.6 N	100.6 E	6.	7.5	YUNNAN
87	1814	11	24	23.7 N	102.5 E	6.	7.5	YUNNAN
88	1833	9	6	25.2 N	103.0 E	8.	11.	YUNNAN
89	1834	4	11	24.9 N	103.0 E	5.	6.	YUNNAN
90	1839	2	7	26.1 N	100.0 E	6.	8.	YUNNAN
91	1839	2	23	26.1 N	100.0 E	6.	7.5	YUNNAN
92	1845	11	3	26.0 N	100.0 E	5.5	7.	YUNNAN
93	1861	7		24.3 N	102.9 E	4.75	6.	YUNNAN
94	1862	2		25.7 N	100.2 E	5.5	7.	YUNNAN
95	1863	6		26.0 N	100.1 E	5.5	7.	YUNNAN
96	1870	7	5	24.0 N	102.0 E	5.	6.5	YUNNAN
97	1876	8	5	25.4 N	99.4 E	6.	7.5	YUNNAN
98	1877	10		25.5 N	102.4 E	4.75	6.	YUNNAN
99	1878	8	7	27.7 N	100.7 E	5.5	7.	YUNNAN
100	1879	11	23	24.6 N	98.7 E	5.	6.	YUNNAN
101	1879	12?		24.4 N	103.4 E	5.5	7.	YUNNAN
102	1882	1		24.4 N	103.4 E	5.75	7.	YUNNAN
103	1884	11	14	23.0 N	101.1 E	6.5	8.	YUNNAN
104	1887	12	16	23.7 N	102.5 E	6.75	9.	YUNNAN
105	1890	4	22	26.5 N	99.9 E	5.5	6.5	YUNNAN
106	1890	10	6	27.3 N	100.3 E	5.	6.	YUNNAN
107	1893	4		25.6 N	102.4 E	5.	6.	YUNNAN
108	1895	7	11	25.3 N	100.3 E	4.75	5.5	YUNNAN
109	1895	2	12	26.8 N	100.2 E	5.5	7.	YUNNAN

quantified because their descriptions are vague. There is also a tendency for the magnitudes of the older earthquakes to be underestimated because they are based on estimates of epicentral intensity and extent of damaged and felt areas. When the population density is low, one would underestimate these parameters. Unfortunately, the intensity scale was not described in our sources (Academia Sinica, 1970a, 1970b, 1974). We suspect that the intensity scale used may be that of Hsieh (1957) which consists of 12 degrees similar to the modified Mercalli scale. The magnitude (M) was determined by using the formula $M = 0.58\ I_0 + 1.5$, where I_0 is the epicentral intensity, and adjusted according to the extent of damaged and felt areas (Academia Sinica, 1970a; Lee, 1958). But the method of adjustments is not described in our sources.

Historical and Modern Seismicity and Faults

In order to put the historical earthquake data in the context of seismicity and tectonics, we compiled a simplified fault map with references to geographic descriptions discussed in the next paragraph (see Figure 2). This fault map is based on LANDSAT (ERTS) images, and its compilation will be described in Wu (1976). It is similar to that of Shih *et al.* (1974), which is based on surface and subsurface data. We then plotted the historical earthquake data and recent earthquake data (1962 to 1974) using the fault map as a base as shown in Figure 3 and Figure 4, respectively. The recent data are taken from the *Preliminary Determination of Epicenters* tape (obtained from National Earthquake Information Service, USGS, Golden, Colorado). In Figure 4, the magnitudes of earth-

quakes are mostly m_b except in cases where surface-wave magnitudes were reported by the Seismological Laboratory of California Institute of Technology at Pasadena, mostly for events of magnitude 6.0 or larger.

The most noticeable difference between Figure 3 and Figure 4 is the apparent seismic quiescence of western China in the pre-instrumental period. This is due entirely to the lack of data there. In Figure 4 we can clearly see that both sides of the Tienshan in Sinkiang, Tibet, Western Szechwan and Tsaidam basin in Tsinghai have all been more active in recent times than most parts of eastern China (east of 104°E longitude). On the other hand, Figure 3 seems to indicate activity along well-delineated belts such as the belt between Tapashan and Tsinling in southern Shensi and Hupeh provinces,

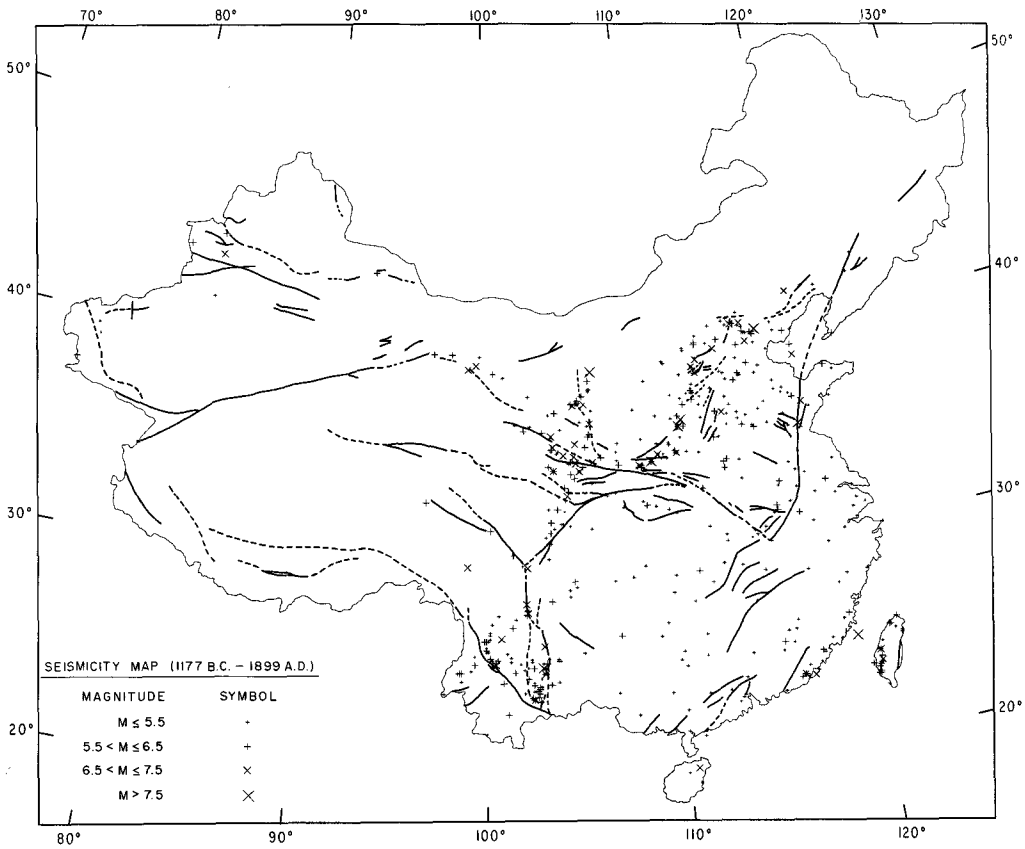

FIG. 3. Map showing distribution of epicenters of historical earthquakes in China (1177 B.C. to 1899 A.D.) using Albers equal-area projection.

Shansi graben in Shansi province, Weiho graben in Shensi province, north of Chilienshan in Kansu, and along Liupanshan and Holanshan in Ningsia and Kansu. These are either not clearly shown or absent in Figure 4. Most of the faults shown in Figure 2 have moderately good seismic expression when both historical and recent data are considered. For example one of the prominent faults in eastern China is the Tanlu fault zone (Figure 3 and Shantung Seismo-Geologic Group, 1974); it can be traced clearly on the LANDSAT images from the eastern side of Tapieshan, in southern Anhwei, through Shangtung and most probably across the Pohai (Gulf of Chihli) and into Liaoning.

The very destructive earthquakes of 70 B.C. and 1668 A.D. appeared to occur along this fault. The magnitude 7.3 Haicheng earthquake of February 4, 1975 in Liaoning

seems to be related to the northern extension of this fault. It is interesting to note that, without the extensive historical records that were so well preserved in China for thousands of years, we would not know for sure that some of the faults are generating destructive earthquakes even though there are ample signs of Quaternary movements.

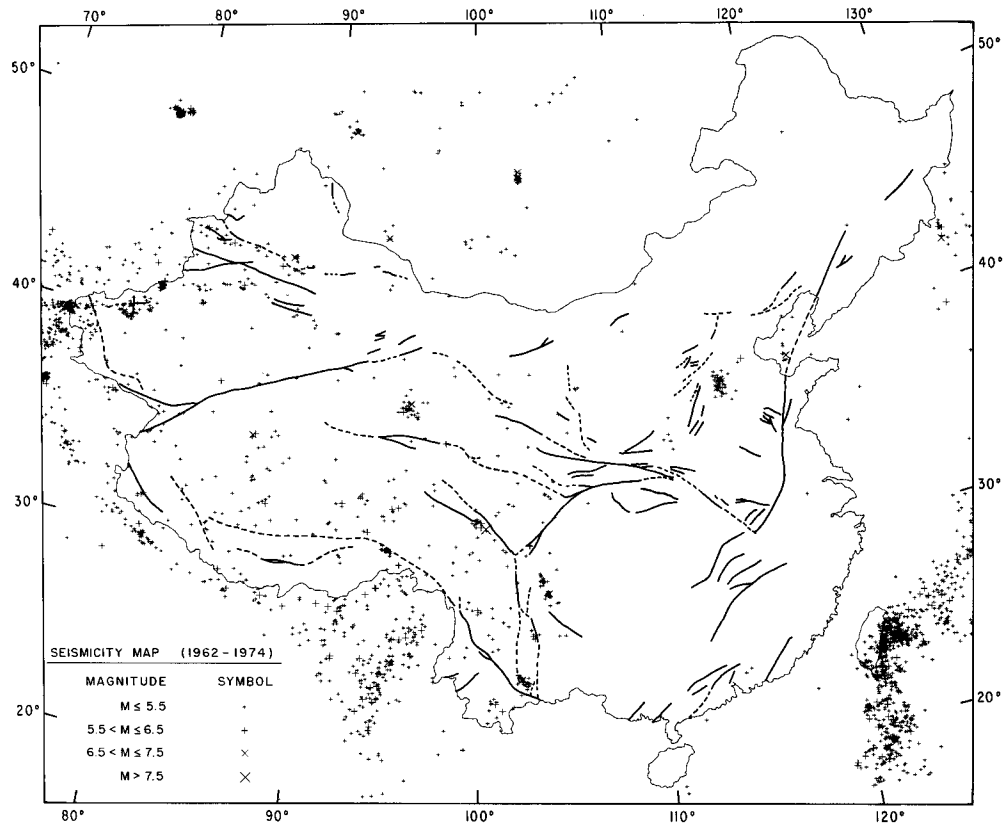

FIG. 4. Map showing distribution of epicenters of recent earthquakes in China (1962–1974) using Albers equal-area projection.

Because the recurrence interval of destructive earthquakes in a given area may be tens or hundreds or thousands of years, it is difficult to evaluate earthquake hazards on the basis of instrumental seismicity data alone. Although there are many difficulties in studying historical earthquakes, we believe that the catalog of historical earthquakes in China is a unique and valuable set of data. By making it more accessible, we hope that it will serve a useful purpose in studying earthquake statistics.

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