

Seismological Investigations.—Thirteenth Report of the Committee, consisting of Professor H. H. TURNER (Chairman), Dr. J. MILNE (Secretary), Dr. T. G. BONNEY, Mr. C. VERNON BOYS, Sir GEORGE DARWIN, Mr. HORACE DARWIN, Major L. DARWIN, Professor J. A. EWING, Dr. R. T. GLAZEBROOK, Mr. M. H. GRAY, Professor J. W. JUDD, Professor C. G. KNOTT, Professor R. MELDOLA, Mr. R. D. OLDHAM, Professor J. PERRY, Mr. W. E. PLUMMER, Professor J. H. POYNTING, Mr. CLEMENT REID, and Mr. NELSON RICHARDSON. (Drawn up by the Secretary.)

[PLATES I.-IV.]

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I. *General Notes.*

For assistance in the compilation of this report and earthquake registers, together with general services rendered in the laboratory, my thanks are due to Mr. S. Hirota, Mr. J. H. Burgess, and Mr. H. C. O'Neill. For financial support, which extends to the observatory at Bidston, I have to thank the Royal Society, the British Association, the administrators of the Gray Fund, and Mr. Richard Cooke. The Committee ask to be reappointed and for a grant of 60*l.*—J. MILNE.

Registers.—During the past year the registers issued are contained in Circulars Nos. 16 and 17. They refer to Shide, Kew, Bidston, Edinburgh, Paisley, Haslemere, San Fernando, Malta, Cape of Good Hope, Azores, Calcutta, Bombay, Kodaikanal, Batavia, Cairo, Trinidad, Toronto, Victoria, B.C., Perth, Sydney, Christchurch, Lima, Irkutsk, Beirût, Cordova, Baltimore, and Honolulu.

Records have not yet been received from Melbourne and Arequipa, while registers from Philadelphia, Mexico, Wellington, and Mauritius should be brought up to date.

The Sydney Register for August 1906, Circular 16, omits any reference

to the disturbance which on the 17th of that month destroyed Valparaiso. The omission is due to the fact that the original seismogram had been loaned to the International Seismological Association, and was not returned in time for publication in its right place. It, however, appears in Circular 17.

In other cases also the International Seismological Association have communicated directly with stations which for some years past have kindly co-operated with the British Association. The result has been that serious inconvenience has been experienced. In connection with this attention may be drawn to the following resolution of the Council of the Royal Society of London, dated December 6, 1906 :—

‘Resolved—That the Council are of opinion that no change should be made in the practice whereby all seismological reports and observations for the United Kingdom are collected and transmitted by Professor Milne.’

It is fully recognised that every station which has kindly given assistance to the British Association Seismological Committee is an independent unit, and will therefore act upon such lines as seem best fitted to advance seismological investigation.

All circulars issued by the British Association Committee are sent not only to co-operating stations, but to others who express a wish to receive them. It has been thought advisable, however, not to send original seismograms anywhere by post, since on several occasions these have been lost. As far as possible photographic copies are sent to those who desire them.

Instruments.—In January and February 1907 two single-boom instruments were despatched to Capt. H. G. Lyons, Director-General Survey Department, Egypt. Each gives an open diagram (similar to Plate II.), and is oriented at right angles—one recording N.S. motion and the other E.W. motion. The station is at Helwan, near Cairo.

On January 21 a similar instrument was forwarded to W. G. Davis, Esq., Director of the Argentine Meteorological Observatory at Buenos Ayres. In October a fourth instrument, also giving an open diagram, was despatched to the order of the Agent-General for South Australia, to Adelaide.

In May 1908 a single-boom instrument was forwarded for the Cosego del Servicio Geográfico, Madrid; while in June a twin-boom seismograph was constructed to be used by the National Physical Laboratory in their new station at Eskdalemuir, South Scotland.

Catalogues.—Considerable time has been spent in cataloguing the papers and books which relate to earthquake phenomena. Those in the English language have been completed, and Mr. O’Neill is now engaged upon those in foreign languages.

Time Signals.—The clock which gives us the time for the instruments at Shide is regulated by a Greenwich signal which is sent daily to all chief post offices throughout Great Britain. From time to time this signal, which is not visible to the public, is kindly given to me by the officials at the General Post Office at Newport. This involves a journey of two miles. To avoid this, and to assure greater accuracy, an attempt was made to obtain this signal at Shide. With this object in view the Astronomer-Royal, and subsequently the Council of the British Association, wrote to the Postmaster-General. It was pointed out that the observatory at Shide ‘has been of universal interest and of recognised public importance. This station serves as a centre for stations

in many of our colonies and in foreign countries. Many of these foreign and colonial stations were established as the direct result of the action taken by the Foreign Office, the Colonial Office, and the India Office, whose assistance was given partly on the ground that the object in view was considered to be of practical value to her late Majesty's Government. The Royal Observatory at Greenwich, and other observatories, refer to Professor Milne in matters of earthquake phenomena; and his observations throw light upon certain cable interruptions, indicating the times when "regulators" and other instruments found in observatories may have been disturbed. But, for the precise rectification of these observations, it will be highly desirable for Professor Milne to receive time signals. Inasmuch as the observations made at Shide and the co-operating stations, directly or indirectly are of assistance to several Government departments, the Council of the British Association desire to urge you to authorise the transmission of the time signal to Professor Milne, not as a member of the public, but as an official carrying out observations which are of service to the State.' From the General Post Office the matter was referred to the Lords Commissioners of the Treasury. When it was found that the only condition under which the signal could be obtained was 'the usual rental terms,' the rental for the wire being 22*l.* per annum, under an agreement for five years, together with the payment for installation, which was very high, the correspondence closed.

II. Sites of Stations.

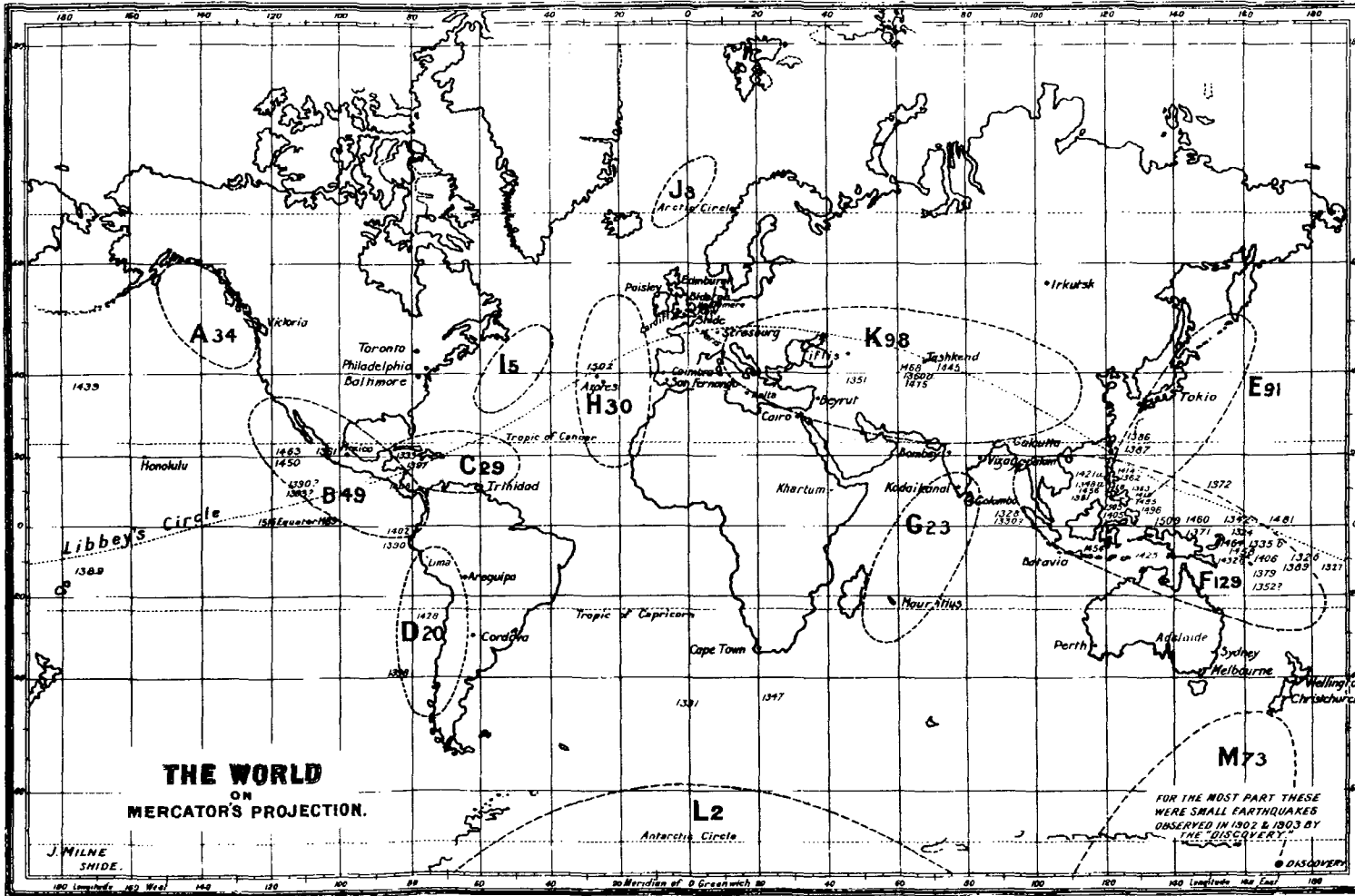
*Perth, Western Australia.*¹—The instrument is established at the observatory, which is situated on a hill 200 feet high quite away from the city. The building stands in the middle of a reserve of 11 acres and the traffic is slight. About a quarter of a mile away there is an electric tram. The seismograph is mounted on a concrete pedestal, and the clockwork on a marble slab on the top of solid brickwork, the whole being embedded in the concrete floor of the basement of the dome building. The character of the soil all round Perth is loose sand, which transmits vibrations only too well. Mr. Cooke, the Government Astronomer, says, 'We have had a lot of trouble and have taken rather unusual precautions to get rid of these vibrations in our transit house, but without any great success.' The Perth Mint authorities have had practically to give up their standard weighings owing to the impossibility of obtaining sufficient stability for their balances. They are right in the centre of the town. The sand seems to be in a state of perpetual quiver, and it is impossible to keep mercury steady—unless in an amalgamated trough—on any of our piers.

Lima.—The observatory is in the Exhibition Gardens, one mile south of the cathedral. Long. 79° 21' 5''·2 W. of Paris. Lat. 12° 3' 5''·8 south. Lima is built on a gently sloping plain formed of ejecta from Rimak during recent times. It is bounded on three sides by foot-hills or spurs of the Andes. Formation is gravel and conglomerate resting on andesites. Distance from sea, 4 miles; height, 400 feet; slope to the sea, 1½ per cent.; foundations for the pillar and table are stone and cement to a depth of 10 feet. The boom runs north to south, the clock-box being at the south end.—Mr. H. HOPE-JONES, Geographical Society, Lima.

¹ Also see *B.A. Reports*, 1905, p. 84; 1906, p. 93; 1907, p. 87.

Origins for 1907 are indicated by their B.A. Shide Register number.

Earthquake districts are indicated A, B, C, &c., and the number of Earthquakes since 1899 which originated from these is expressed in large numerals.



Illustrating the Report on Seismological Investigations.

III. *On the Orientation of an Instrument with regard to the Building in which it is placed.*

At Shide, in the Isle of Wight, one portion of the observatory runs east and west. It has two north and south cross-walls; it is therefore very much more stiff in an east and west direction, or along its length, than in a direction at right angles. Storms generally strike the building from the south or south-west—that is to say, in the direction it is most likely to yield. In the building there are two very heavy horizontal pendulums, one of which points to the south and the other towards the east. At the time of strong winds, or even in light gales the latter pendulum, even in spite of damping arrangements, responds to wind impacts from the south or south-west. It does this to such an extent that during stormy weather it is useless as a recorder of earthquakes. I may add, the building is very solidly constructed; the support for the pendulum is a heavy mass of concrete entirely free from the foundation of the building. The pendulum which points north, south, or end on to the direction from which gusts of wind come, remains quite steady even during the heaviest of storms. Both pendulums are attached to the same support, which is a lamp-post embedded in the concrete foundation already mentioned.

IV. *The Large Earthquakes of 1907.*

On the accompanying map (Plate I.) we find the origins of large earthquakes which have occurred during 1907 indicated by their numbers as given in the Shide Register. The accuracy of the position of an origin which is indicated by the position of a number greatly varies, and is naturally dependent upon the data available for its determination. In certain instances a number only means that a particular disturbance originated within a certain district. For the year 1907 we see that certain of these districts were entirely free from megaseismic disturbances. The area which suffered the greatest disturbance was district F. This and its Himalayan continuation is one where irregularities of surface contour are pronounced, and it is therefore a district in which seismic instability should be expected. The following table gives the number of large earthquakes which have occurred in the principal earthquake-producing regions since 1899:—

		1899	1900	1901	1902	1903	1904	1905	1906	1907	Total.	Ratio to D.
East Pacific	A	13	9	3	2	3	0	2	2	0	34	1.6
	B	5	4	10	7	6	0	4	3	10	49	2.3
	C	4	6	4	6	3	0	0	4	2	29	1.4
	D	9	1	1	3	1	0	0	4	2	21	1.0
Total		31	20	18	18	13	0	6	13	14	133	
West Pacific	E	18	3	7	9	9	14	9	15	7	91	4.3
	K	4	2	8	22	23	5	15	14	6	98	4.7
	F	8	11	12	14	10	9	16	24	25	129	6.1
Total		30	16	27	45	41	28	40	53	38	318	
Grand total		61	36	45	63	54	28	46	66	52	451	

The first four districts are on the eastern side of the Pacific and in the Caribbean Sea, while the last three refer to the western side of the Pacific

and the Himalayan ridges. The totals for these groups of districts show that the greatest seismic activity has been on the Asiatic side of the Pacific Ocean, particularly in the East Indian Archipelago. The least disturbed district has been the west side of South America. Another feature of interest shown by these totals is that from the year 1902 they rise and fall together; that is to say, seismic frequency on the two sides of the Pacific has fluctuated similarly. From this we may infer that seismic frequency in a district is not entirely governed by local influences, but largely by influences which extend over very large areas. As illustrative of these latter influences attention may be called to the redistribution of surface materials by ocean currents, or to stresses which may accompany unusual changes in the path followed by the pole of our earth.

V. *After-shocks of the Jamaica Earthquake, January 14, 1907.*

In an official report, No. 33a, on the earthquake of January 14, 1907, by Maxwell Hall, the time given for the commencement of the main disturbance is 3.29 P.M. (Jamaica time). The difference in longitude between Kingston and England is equivalent to 5h. 7m., and the time which large waves would take to travel between these places or 67° would be 43m. The time at which this particular phase of motion would be recorded in England would approximately be 21h. 19m. (G.M.T.) Inasmuch as Mr. Maxwell Hall's time refers to an observation made at Chapleton, and not at Kingston, we should expect the arrival of waves in England to be one or two minutes earlier than the time we have just given, and as a matter of fact they were recorded at the Isle of Wight at 21h. 17m. During the night of the 14th and 15th, we learn from the same report that 15 shocks were counted at Kingston. The times at which these occurred are not given, but as they appear to have been noted by persons out of doors we regard them as the more violent members of a much larger series. In the Isle of Wight small disturbances were recorded on the 14th at 23.40, 23.45, 23.52, and on the 15th at 0.2, 0.22, 0.32, 0.41, 0.43, and 0.45. We cannot say with certainty that these had their origin in the West Indies; it is, however, extremely likely that this is the case. With regard to many of the shocks in Jamaica, the times of which are given by Mr. Maxwell Hall, the case is different. Between January 14, 7.5 P.M., and July 5, 2.10 P.M. (Jamaica time), 148 disturbances were recorded. Corresponding to 51 of these a seismograph in the Isle of Wight shows groups of tiny tremors, each of which was recorded at practically 43 minutes after a shock in Jamaica. The conclusion therefore is that the tremor groups represent after-shocks which have been sufficiently intense to traverse a distance greater than the width of the Atlantic. They do not appear to have been recorded at Strassburg, Göttingen, or Laibach, although the distance of these places is but little greater than the distance to the Isle of Wight. As this is the first time that a series of after-shocks has been recorded so far from their origin, and as the records of the same illustrate the high sensibility of the Milne horizontal pendulum, I give a list of these movements.

*After-shocks of the Earthquake at Jamaica, which were recorded
in England, January 14, 1907.*

	Jamaica Time	G.M.T.—Time when Shock should reach England	G.M.T.—Time when a Disturbance was recorded in England
2. January 14	8.3 P.M.	January 15, 1.53	1.52
3. "	9.2 P.M.	2.52	2.53
4. "	10.0 P.M.	3.50	3.39 and 3.51
5. "	11.15 P.M.	5.5	5.4
6. January 15	1.40 A.M.	7.30	7.25, 7.40
7. "	3.0 A.M.	8.50	8.45 to 8.50
8. "	3.30 A.M.	9.20	9.19
9. "	6.0 A.M.	11.50	11.45
10. "	10.0 A.M.	15.50	15.45
11. "	11.25 A.M.	17.15	17.14
12. "	11.58 A.M.	17.48	18.12
13. January 16	2.55 A.M.	8.45	8.45 to 8.57
14. January 17	11.30 A.M.	17.20	17.19
15. January 18	11.30 A.M.	17.20	17.20
16. January 19	3.0 A.M.	8.50	8.50
17. "	9.30 A.M.	15.20	15.22
18. "	10.50 A.M.	16.40	16.35
19. January 21	6.0 P.M.	23.50	23.45
20. January 28	4.33 A.M.	10.23	10.18
21. "	8.0 A.M.	13.50	13.53
22. January 30	7.21 A.M.	13.11	13.11
23. "	8.20 A.M.	14.10	14.11
24. February 4	4.0 A.M.	9.50	9.45
25. "	7.0 A.M.	12.50	12.55
26. February 5	1.30 A.M.	7.20	7.11
27. "	5.15 A.M.	11.5	11.15
28. "	10.59 P.M.	February 6, 4.49	4.38
29. February 6	2.55 A.M.	8.45	8 to 9
30. February 10	12.20 A.M.	6.10	6.10
31. "	2.0 P.M.	19.50	19.48
32. February 11	5.30 P.M.	23.20	23.22
33. February 22	6.15 P.M.	February 23, 0.5	0.5
34. February 28	7.40 A.M.	13.30	13.35
35. March 1	4.15 A.M.	10.5	10.7
36. March 8	4.15 A.M.	10.5	10.4
37. March 9	5.45 A.M.	11.35	11.30
38. March 11	1.50 A.M.	7.40	7.42
39. March 14	11.0 P.M.	March 15, 4.50	4.53
40. March 17	6.30 A.M.	12.20	12.15
41. "	7.45 P.M.	March 18, 1.35	1.20
42. March 19	6.10 A.M.	12.0	12.7
43. March 27	8.55 A.M.	14.45	14.40
44. March 28	8.30 A.M.	14.20	14.25
45. April 16	7.0 A.M.	12.50	12.58
46. May 1	3.45 P.M.	21.35	21.25
47. "	8.30 P.M.	May 2, 2.20	2.20
48. May 3	11.10 A.M.	17.0	17.2
49. June 13	1.18 A.M.	7.8	7.1
50. June 16	11.0 A.M.	16.50	16.56
51. July 1	5.10 A.M.	11.0	11.1
52. July 5	2.10 P.M.	20.0	20.3

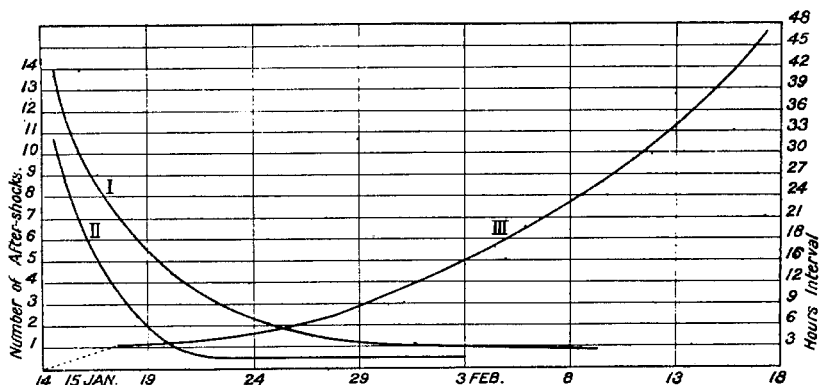
The decay in seismic activity, as indicated by a decrease in the frequency of after-shocks, is shown by the left-hand curves in fig. 1.

1908.

F

FIG. 1.

After-shocks of the Jamaica Earthquake, January 14, 1907.



- I = After-shocks in Jamaica.
 II = After-shocks which reached Great Britain.
 III = Mean time intervals between after-shocks in Jamaica.

The Time Intervals between After-shocks.

As we recede from the primary shock the intervals between the after-shocks ought to become greater and greater, the increase in time interval indicating the nearness of approach to complete settlement. But in taking means of the intervals, as pointed out by Mr. O'Neill, a grave error may creep in by reckoning the means over arbitrary periods. In this way, to reckon the mean interval between the shocks for each day, three days, or each week, may or may not give any satisfactory result. It is mere chance in either case. But if we take the intervals over a sufficiently long period, and take means at points where the intervals have appreciably increased, we stand to obtain a result which more nearly approaches a true statement of the case. Thus means were first taken from day to day between January 14 and February 17, and the daily means worked out as follows: 1h. 19m., 2h. 31m., 5h. 20m., 5h. 1m., 3h. 11m., 2h. 41m., 4h. 48m., 6h. 21m., 3h. 38m., 5h. 0m., 11h. 51m., 19h. 30m., 10h. 52m., 18h. 40m., 14h. 10m., 6h. 38m., 18h. 18m., 28h. 0m., 23h. 55m., 24h. 10m., 13h. 57m., 7h. 10m., 8h. 28m., 35h. 8m., 6h. 5m., 82h. 40m. Now it will be noticed that there are appreciable increases on the 17th, when the mean becomes about 5 hours. Another occurs on the 21st, when the interval has reached 6h. 21m. On the 25th it has become 19h. 30m., on the 31st, 28h. 0m., on February 6, 35h. 8m., and on the 11th, 82h. 40m.

If, then, we take means at these points we obtain results as follows, which show a constant increase in the time intervals as the distance from the primary shock increases.

Between January 14 and January 17, for 24 intervals, the mean is 3h. 10m.
" " 17 " 21, " 27 " " 3h. 48m.
" " 21 " 25, " 12 " " 7h. 21m.
" " 25 " 21, " 15 " " 12h. 3m.
" " 31 and February 6, " 14 " " 14h. 46m.
" February 6 " 17, " 4 " " 46h. 52m.

The right-hand curve in fig. 1 shows the rate at which the intervals between after-shocks increased and seismic stability was approached. This curve, which should be the inverse of the upper curve in the left-hand side of the figure, is now shown, I believe, for the first time.

VI. *On the Dissipation of Earthquake Motion as measured by Amplitude and Duration.*

In order to obtain some idea of the manner in which a very large earthquake approaches extinction as it radiates, a comparison has been made of the amplitude and duration of motion of twenty-two large earthquakes, as recorded by instruments installed at varying distances from megaseismic origins.

The first question which arises relates to the comparability of the records. The instruments which give the records here used are, for the most part, the type adopted by the British Association—viz., Milne horizontal pendulums. A single record of a world-shaking earthquake from one of these instruments or from any other instruments would by two observers be interpreted for amplitude in a similar manner. For duration, however, this would not necessarily be the case. An examination of the film by one observer might make the duration a few minutes longer or shorter than that determined by another observer. Again, two similar and similarly adjusted instruments beneath the same roof may yield records showing slight differences, particularly with regard to duration. A complexity of factors conspire to render seismograms obtained from what we regard as similar, similarly adjusted, and similarly installed seismographs not strictly comparable. They are, however, to a certain extent comparable, and an estimate of this comparability may be obtained by an examination of a series of teleseismograms obtained from instruments installed over an area like that of Great Britain, each part of which is practically at the same distance from all very distant origins. In Britain we have stations at Shide (Isle of Wight), Kew, Bidston (near Liverpool), and at Edinburgh, each of which is provided with British Association pendulums. The foundations at these places are respectively chalk, alluvium, red sandstone, and volcanic rock. The records for amplitudes for earthquakes with distant origins have been as follows.¹

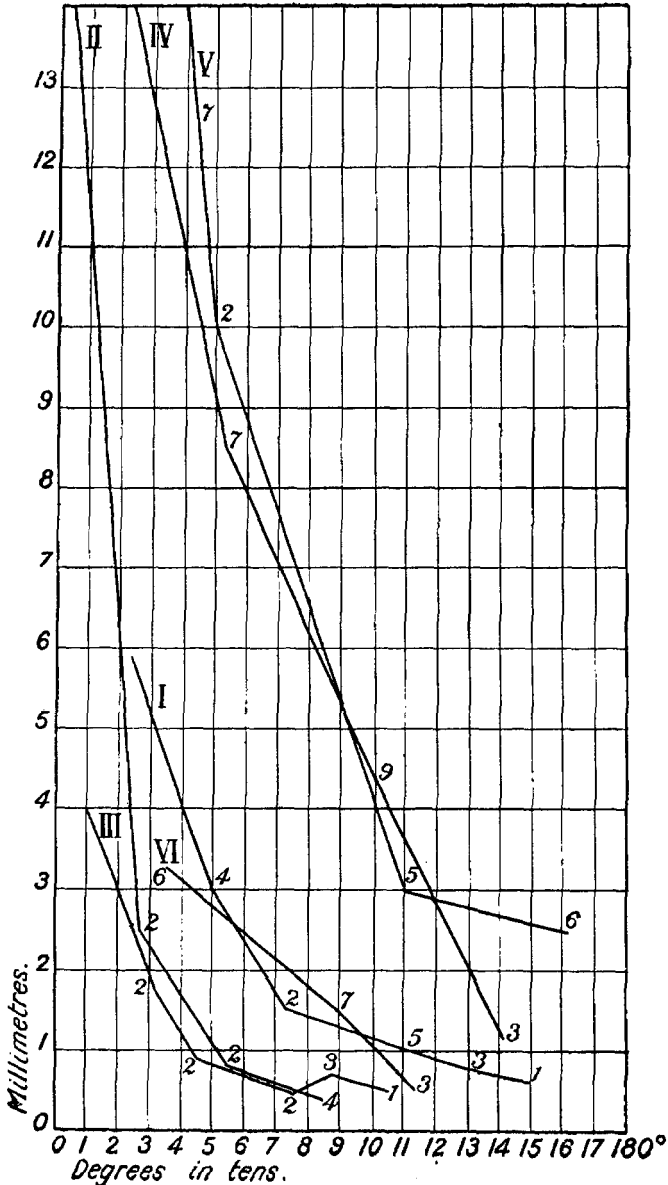
Amplitudes.—For seventeen large earthquakes the average amplitudes measured in millimetres were as follows: Shide, 2·1; Bidston, 1·4; Edinburgh, 1·4; and Kew, 1·5. Three of these are distinctly comparable.

1. *Decrease in Amplitude.*

As illustrative of the decrease in amplitude six large earthquakes have been selected from the catalogue of earthquakes recorded in the Antarctic regions in the years 1902–3. This catalogue is now being published. The dates and origins of the selected disturbances are the first six given on page 72. At distances varying between 30° and 165° from the above origins, records were made of each of these earthquakes at many stations. The actual number of observations are given on page 72. The instruments used were in all cases Milne horizontal pendulums. The amplitudes in millimetres in relation to distances from origins measured in degrees are shown in fig. 2. The small figures on a curve indicate the number of stations at or near given distances from an origin which were used to compute an indicated amplitude; thus for earthquake No. I., at a distance of 25° from its origin, one station gave an amplitude of 5·8 mm. At about 50° the average amplitude for four stations was 3mm., &c.

¹ See *Brit. Assoc. Reports* for 1901, p. 48, and 1903, p. 82.

FIG. 2.
Curves of Amplitude from Milne H.P.



Curves for earthquakes I., II., III., and V. show that up to a certain distance from an origin, amplitude is inversely proportional to distance.

After this the curves for amplitude rapidly become less steep and

tend to be asymptotic to the ordinate for distance. The distance from an origin at which a curve tends to be asymptotic is apparently dependent upon the intensity of the originating impulse, which may be estimated by the magnitude of the records near to an origin and the distance at which effects of the impulse have been recorded.

The rapid decrease in amplitude shown in the curves is probably in large measure due to the spreading out of the waves as they approach their equatorial region, and also to frictional resistance. An estimate of this latter factor has been made by Dr. C. G. Knott. The data on which the estimate is based will be found in the chapter on Seismic Radiations in his forthcoming work on the Physics of Earthquake Phenomena. By a comparison of the maximum amplitudes of the records of an earthquake produced at any one station, as the tremors have passed through the minor arc or through the major arc connecting the epicentre with the station, he found that, in virtue of viscosity of the material, the amplitude of the Large Waves is cut down to half its amount at a distance of $41^{\circ}2$.

Observations which indicate that certain earthquakes, although not recorded in their quadrantal region, but may be recordable in antipodean regions, suggest that the curves we have given would, if continued, have a slight rise upwards.¹

2. *Changes in Duration.*

An indication of the value which may be placed upon a set of similar instruments as recorders of the duration of earthquakes which have originated at great distances, the following figures are quoted from the British Association Reports in 1901, p. 47; 1903, p. 82. For twenty-four large earthquakes recorded at Shide, Edinburgh, Bidston, and Kew, the total durations were respectively 1,493, 1,516, 1,464, and 1,371 minutes. The average durations of these earthquakes were therefore 62, 63, 61, and 57 minutes. These figures show that although the instruments at these stations were installed upon very different foundations, already described, the records they yielded were in close accordance. They also tend to confirm the idea I have frequently expressed—viz., that with megaseismic movements the crust of the world moves much in the same way as a raft does upon the ocean. All parts of it, whether alluvium or crystalline, respond to forced oscillations. For a small earthquake, by which is meant one which only disturbs a small area, the result is different. In this case stations in close proximity to each other may yield records of duration and amplitude which, amongst other things, depend upon the nature of the strata upon which the instruments have been installed. If a list is made of the duration of local shocks, and this is combined with a list giving the duration of teleseismic movements, it would appear that the duration of earthquakes increases with the distances of their origins. Such a result, however, is based upon records which are hardly comparable—one is a vibration of the earth's crust, whilst the other, to a great extent at least, appears to be due to a mass movement in the material beneath the crust. Attention was drawn to this in a British Association Report, 1892, pp. 225-227. In that report I expressed the view that both types of disturbance as they radiated exhibited a duration which became less and less. Now that we have many records of durations for given large earthquakes, which were obtained at widely separated stations,

¹ *Proc. Roy. Soc.*, Vol. A76, 1905, p. 293

the statement made nine years ago, so far as it relates to megaseisms, requires modification. In many instances it appeared that as a given world-shaking earthquake travelled away from its origin, there had been an increase in its duration. The matter seems to be of sufficient interest to demand close examination. This was undertaken by Mr. H. C. O'Neill, and the results at which he arrived are as follows :—

'The difficulty in attacking this problem plainly emerged when a number of earthquakes had been plotted on squared paper, with distance and duration as ordinates and abscissæ respectively. It is known that earthquake motion starts from (what may be regarded as) a point, and that it communicates its motion to distant parts of the earth's surface. At times the intensity of the shock is not sufficient to send waves as far as the antipodes of the centrum. We have therefore a point whence the motion starts and a point beyond which it is not recorded ; and as the latter has zero duration, it seems probable that the former has the maximum duration, and that the durations grow less as they approach the zero position. It was with the object of testing this inference that the investigation was commenced. The "Katalog der im Jahre 1904 Registrierten Seismischen Störungen," published by the Central Bureau of the International Seismological Association, offered the material ready made. Twenty-six earthquakes were taken from Liste A, giving 991 observations in all. Several of these were plotted on squared paper, but the curves were too irregular to yield any satisfactory conclusion, and an attempt to delete the most irregular observations offered too much opening to unconscious selection. Professor Pearson's method¹ for deriving correlation between two variables was therefore selected in order to avoid this. But it was necessary to secure a large number of comparable observations. Taking the mean of all the observed durations for a given earthquake, it is clear that the durations of different earthquakes are not comparable as they stand. The means for several earthquakes (in minutes) were 108·7, 94·13, 56·66, 52·42, 86·96, 67·62, 29·11, 49·62, 93·0, 199·2 ; and these show with sufficient clearness the point suggested. Some method was therefore required to obtain figures that should be more or less independent of any given earthquake. The readiest and simplest method that seemed to achieve this (suggested by Professor Pearson) is as follows : if x be the duration of a given earthquake at a given distance d , and if \bar{x} be the mean of all the observed durations for the same earthquake, then the new duration character X at the given distance d is given by

$$\frac{x - \bar{x}}{\bar{x}} = \frac{x}{\bar{x}} - 1.$$

Since -1 is common to all, it may be neglected for calculating the correlation when X for distance $d = \frac{x}{\bar{x}}$. The 991 observations treated by this

method were then arranged for correlation, when the result was $\cdot 06$, with the probable error $\pm \cdot 02$. This means that if 1 represents perfect correlation and 0 complete absence of it, then $\cdot 06$ represents the degree of correlation between distance and duration. And the result is to be interpreted as showing that the correlation is very small, but may be just significant, as it is three times the probable error ; or, that the

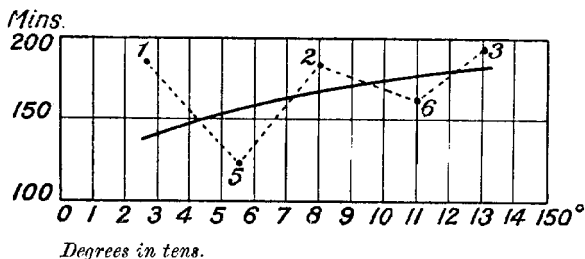
¹ A good account of this method and the nature of problems it is designed to treat is to be found in *Frequency Curves and Correlation*, by W. Palin Elderton.

variants are sufficiently numerous to render a larger correlation non-energent.

'A tabulated list was then made of the stations which stood out, on the curves plotted originally, as abnormal—*i.e.*, those that stood at the head of very steep gradients when the points representing the observations were joined; such observations represented in numbers 2 to 4 \bar{x} . A list of these showed that the results from six stations were consistently abnormal at whatever distance from the origin they might be situated in different earthquakes. These stations were Irkutsk, Taschkent, Dorpat, Nikolaiev, Potsdam, and Hamburg, and they were accordingly deleted as representing a negligible variant. The curves were not much improved by this treatment, however, and so the correlation was re-calculated. This time thirty-one earthquakes were taken from Liste A in the Katalog, six from "Earthquakes and other Earth Movements recorded in the Antarctic Regions, 1902-3" (Royal Society—in press), and the Great Indian Earthquake of 1905 from Part II. of the report (Earthquake Investigation Committee, Tokyo, 1907). These gave 1,029 observations in all, and the correlation came out as .10, with the probable error $\pm .02$, a more significant correlation.'

The next step in the investigations was to plot the duration of a given earthquake as recorded at stations situated at different distances from an origin upon squared paper. This was done for twenty-two disturbances, the distances of stations from origins varying from between 20° and 160°. The resulting curves or figures were, as might be expected, serrated in appearance (see dotted line, fig. 3), but still the greater number of them suggested that duration increased as the distance from the origin increased.

FIG. 3.



No. 1, March 28, 1902. Shide List, No. 601.
Origin Banda. Nineteen observations.

When a number of stations at approximately the same distance from an origin were taken in groups and a mean time for each group was plotted against a mean distance an increase of duration with distance became more pronounced. The general trend or approximate curves for the first twelve of these figures is shown in fig. 4. The meaning of line No. I., for example, is that this earthquake at a distance of 25° from its origin had a duration of 135 minutes, while at 130° distant the duration was about 178 minutes. It is identical with the thick line shown in fig. 3. These durations are those indicated on seismograms *plus* the time taken for preliminary tremors to travel from an origin to the observing stations. Whether this correction is or is not necessary, because it is small, its effect upon the general result is small also. For four of the earthquakes,

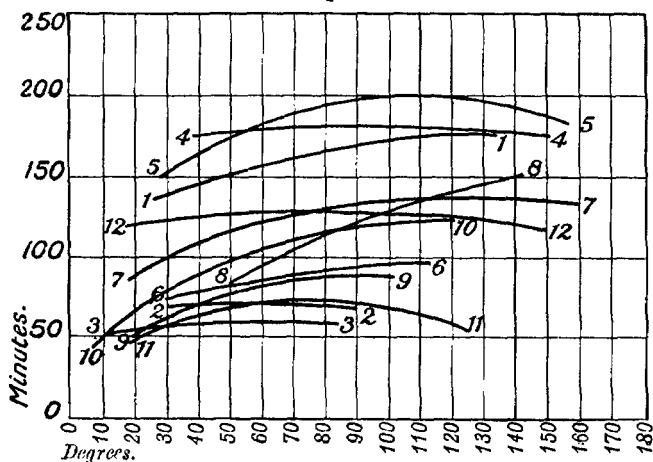
Nos. II., III., XI., and XII., the duration at the commencement and at the end of the movement is practically the same. It cannot be said to be less. For the remainder the duration at the end is distinctly greater than near the beginning. The greatest duration has generally been in regions lying between 70° and 110° from an origin; that is to say, in a quadrantal region where amplitude is least and approaches a constant value.

The following is a list of the twelve earthquakes employed, with their origins and the number of observations which were used in determining each curve:—

No.	Date	Slide No.	Origin	No. of Observations
1	March 28, 1902	601	Banda	19
2	May 2, 1902	607	N.E. Japan	8
3	May 8, 1902	609	N. of Philippines	13
4	Sept. 22, 1902	641	Guam	22
5	Sept. 23, 1902	642	Guatemala	20
6	Nov. 21, 1902	659	Formosa	24
7	Jan. 20, 1904	806	Costa Rica (?)	35
8	March 19, 1904	826	29° S. 71° W. (?)	26
9	March 31, 1904	832	95° E. 40° N.	35
10	April 4, 1904	834	23° E. 41° N.	28
11	April 5, 1904	835	102° E. 30° N.	27
12	Aug. 24, 1904	884	Philippines	43

For Nos. 1-6 only records from Milne instruments were employed. For the remainder the records were obtained from stations for the most part employing Milne instruments, but not in all cases. One explanation

FIG. 4.
Duration of Selected Earthquakes in relation to Distance.

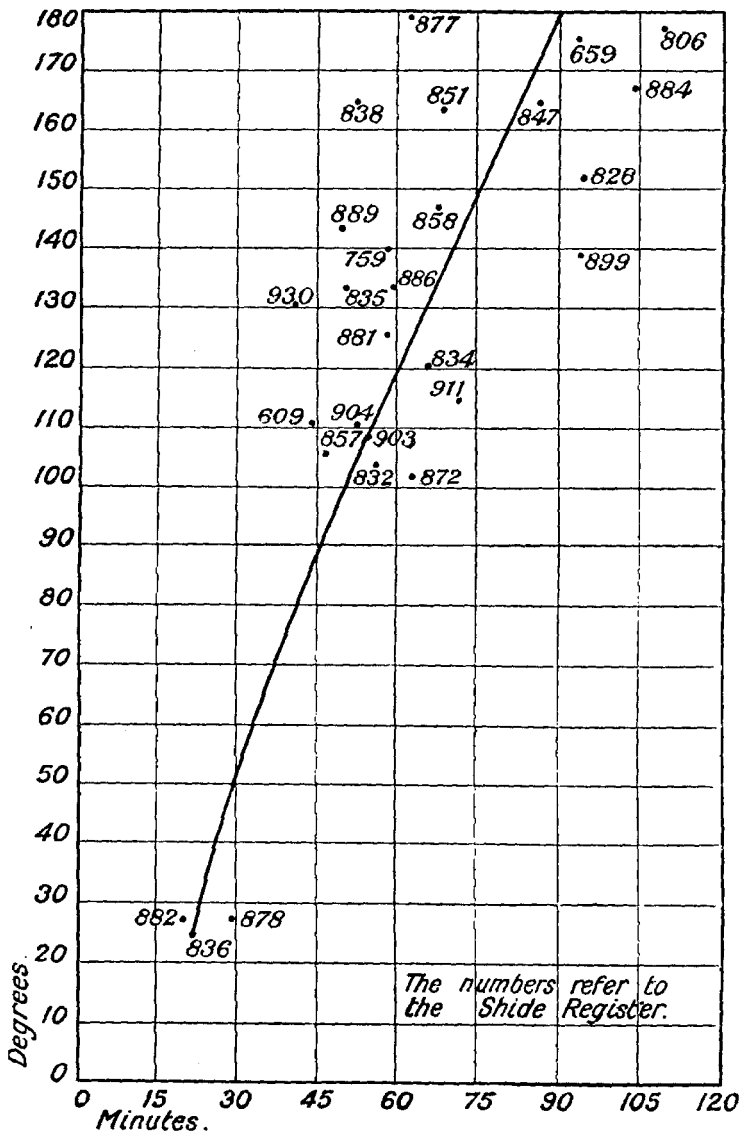


for the observations which have been made upon amplitude and duration is that at the time of a very large earthquake the material inside our earth is moved as a whole.

Fig. 5 indicates that the mean duration of an earthquake increases with the distance to which it is propagated. This in turn is dependent

FIG. 5.

Mean Duration of several Earthquakes and the Distance they have travelled.



upon the intensity of the initial impulse. Fig. 4 leads to similar conclusions.

VII. *On the Direction in which Earthquake Motion is most freely propagated.*

We frequently see the isoseists of an earthquake in the form of ellipses, which indicate that motion of a given intensity has been propagated farthest in a particular direction. In a discussion of earthquakes observed in the Antarctic regions, see 'Proceedings, Royal Society,' Vol. A76, 1905, p. 293, I showed that certain large earthquakes had travelled round the world in bands, the length of which had their greatest extension from their origins in particular directions. The object of the present note is to show that certain large earthquakes with approximately known origins in the Northern Hemisphere have been recordable at a greater distance measured towards the west than towards the east. Also the distance to which the motion extended across and to the south of the equator was less than the distance to which it travelled east or west in the Northern Hemisphere. The phase of motion here referred to is that of the large waves which travel to greater distances than their precursors. This particular phase has a practically constant speed, whether its path is across the alluvial plains of Asia, the granites of North America, or beneath an ocean. The crust of the world is apparently influenced by movement in a medium which it covers. The number of earthquakes considered has been seventy-four, and they are designated by their Shide number given in the registers published by the British Association. Their origins were in one of the following three districts:—

District No. 1 is south of the Caucasus, approximately 40° N. lat. and 45° E. long. The earthquakes considered are 588, 595, 598, 704, 705, 713*b*, 948, 1,077, 952, and 1,351.

District No. 2 is north of Eastern India, approximately 80° E. long. and 30° N. lat. The earthquakes considered are 618, 613*b*, 663, 626, 640, 644, 662, 632, 653, 676, 696, 692, 689, 793*c*, 720, 684, 679, 832, 833, 982, 1,070, 1,052, 1,036, 1,038, 963, 9,83*b*, 1,044*b*, 1,320, 1,293, 1,184, 1,133, 1,240, 1,208, 1,135, 1,264, 1,167, 1,129, 1,153, 1,468, and 1,475.

District No. 3 is east coast of Japan and north of the Philippines, approximately 130° E. long. and 30° N. lat. The earthquakes considered are 899, 896*b*, 935, 1,150, 857, 963, 1,166, 1,145, 1,387, 861, 859, 860, 863, 1,111, 1,266, 858, 903, 1,010, 1,274, 1,11*i*, 1,130, 1,163, 1,386, and 862.

In the following three tables which refer to these districts we find in the successive columns—1st, the names of stations where earthquakes were recorded; 2nd, the approximate distance of a station from an origin; 3rd, the number of earthquakes which we should expect to have been recorded; 4th, the number of earthquakes which were actually recorded; 5th, the percentage of possible records. Stations the names of which are printed in italics are in the Southern Hemisphere.

In Great Britain there are five stations, and therefore the opportunities for obtaining records have been greater than they were at isolated stations. This partly may explain the high percentage of records obtained in Britain. But if we reduce the number of records obtained in Britain to the number obtained at San Fernando in Spain, where there is only one instrument, the general result is but little altered. A similar remark applies to India, where there are three stations. In New Zealand there are two stations. In Manila the instrument is not of the Milne type.

District No. 1, South of the Caucasus.

Station	Distance	Possible Records	Actual Records	Percentage of Records
Beirut	10	4	4	100
Cairo	16	7	2	28
British stations	32	19	10	100
San Fernando	38	10	8	80
Indian stations	38	10	6	60
Irkutsk	44	9	5	55
<i>Mauritius</i>	60	7	2	28
Japan	72	9	0	0
<i>Batavia</i>	74	10	2	20
<i>Cape Town</i>	75	10	3	30
Toronto	80	10	4	40
Victoria	88	10	4	40
<i>Australia</i>	98	10	2	20
Honolulu	115	7	2	28
<i>Cordova</i>	125	10	2	20
<i>New Zealand</i>	135	10	2	20

District No. 2, North of Eastern India.

Station	Distance	Possible Records	Actual Records	Percentage of Records
Indian stations	12	40	38	95
Irkutsk	28	38	35	92
Beirut	36	23	16	69
Manila	38	17	11	61
Cairo	40	33	17	50
<i>Batavia</i>	45	40	30	75
Japan	50	32	14	45
<i>Mauritius</i>	55	31	14	45
British stations	62	40	39	97
San Fernando	70	40	25	62
<i>Australia</i>	70	40	17	42
<i>Cape Town</i>	85	39	16	41
Victoria, B.C.	95	40	24	60
Toronto	100	40	21	52
Honolulu	105	26	16	66
<i>New Zealand</i>	105	36	5	14
<i>Cordova</i>	155	28	7	24

District No. 3, Japan and the Philippines.

Station	Distance	Possible Records	Actual Records	Percentage of Records
Irkutsk	30	22	17	77
<i>Batavia</i>	40	21	11	52
Indian stations	45	24	18	75
Honolulu	60	24	17	71
<i>Australia</i>	60	24	13	54
Victoria, B.C.	72	24	12	50
<i>Mauritius</i>	75	24	7	29
Beirut	78	22	14	64
<i>New Zealand</i>	82	24	4	17
British stations	88	24	24	100
Toronto	98	24	13	53
San Fernando	100	24	17	71
<i>Cape Town</i>	120	24	7	29
<i>Cordova</i>	165	24	5	21

From the above three tables, if we omit Batavia, it being near the Equator, we obtain the following results :—

In District No. 1 the five stations in the Southern Hemisphere have an average distance from an origin of 98° , and the average number of records has been 23 per cent. The remaining nine stations in the Northern Hemisphere had an average distance of 51° , while the average percentage of their records is 59.

For District No. 2 the average distance from an origin for five southern stations was 94° , and the average percentage of records was 33. The corresponding figures for the eleven northern stations are 58° and 68 per cent.

For District No. 3 the figures for the five southern stations are 100° and 30 per cent. The corresponding figures for the eight northern stations are 71° and 70 per cent.

The averages for the three districts taken together are for the southern stations 97° distance and 39 per cent. of records, while for the Northern Hemisphere we get 60° and 66 per cent.

When looking at the above three tables it must be remembered that amplitude of motion decreases rapidly with distance from an origin, and therefore too much stress should not be put upon the fact that stations in the Southern Hemisphere were at greater distances from origins than those in the Northern Hemisphere. On p. 77 we compare stations in the two hemispheres which are at equal distances from origins.

Comparison of Records obtained from Stations lying to the West of Origins with those which lie to the East. The Stations compared are approximately at the same Distance from the Origins considered.

DISTRICT No. 1.					
Stations to West.			Stations to East.		
Station	Distance	Percentage of Records	Station	Distance	Percentage of Records
San Fernando . . .	58	80	India	33	60
Toronto	80	40	Batavia	74	20
Victoria	80	40	Honolulu	115	28
Average	69	53	Average	75	36

DISTRICT No. 2.					
Beirut	36	69	Mauritius	38	61
Cairo	40	50	Japan	50	45
Average	38	59	Average	44	53

DISTRICT No. 3.					
Beirut	78	64	Victoria	72	50
San Fernando	100	71	Toronto	98	53
San Fernando	100	71	Victoria	72	50
Average	93	69	Average	78	51

The general average for the three districts combined is for the western stations a distance of 66° and 60 per cent. of records; whilst for the eastern stations the distance is also 66° , but the number of records fall to 46 per cent.

These figures, whether taken collectively or as entries for any pair of stations, apparently indicate that earthquake motion is propagated more freely towards the west than it is to the east.

Comparison of Records obtained from Stations in the Northern Hemisphere with those obtained in the Southern Hemisphere. All Stations which are compared are at approximately the same distance from the Origins considered.

DISTRICT No. 1.

Stations in Southern Hemisphere.			Stations in Northern Hemisphere.		
Station	Distance	Percentage of Records	Station	Distance	Percentage of Records
Cape Town . . .	75	30	Toronto . . .	80	40
Australia . . .	98	20	Victoria . . .	88	40
Cordova . . .	125	20	Victoria . . .	88	40
New Zealand . . .	135	20	Honolulu . . .	115	28
			Honolulu . . .	115	28
Average . . .	108	22	Average . . .	97	34

DISTRICT No. 2.

Mauritius . . .	55	45	Japan . . .	50	45
Australia . . .	70	42	San Fernando . . .	70	62
Cape Town . . .	85	41	Victoria . . .	95	60
New Zealand . . .	105	14	Honolulu . . .	108	66
			Toronto . . .	100	52
Average . . .	79	35	Victoria . . .	95	60
			Average . . .	86	57

DISTRICT No. 3.

Australia . . .	60	54	Honolulu . . .	60	71
Mauritius . . .	75	29	Victoria . . .	72	50
New Zealand . . .	82	17	Victoria . . .	72	50
Cape Town . . .	120	29	Beirut . . .	78	64
			Beirut . . .	78	64
Average . . .	88	32	British stations . . .	88	100
			San Fernando . . .	100	71
			Average . . .	78	68

If we take an average for the above three districts we get for the Southern Hemisphere an average distance of 90°, with an average percentage of records of 29 per cent. For the Northern Hemisphere the corresponding figures are 87° and 53 per cent.

General Conclusions.

The General Conclusions are, *first*, that a greater percentage of earthquakes travel farther west, or against the motion of the earth, than they do towards the east; and *second*, that the range of recorded motion across the Equator to the south is shorter than it is towards the east or west.

In any hypothesis to explain these observations we should bear in mind that the direction in which a given earthquake travels farthest will involve, amongst others, the following considerations:—

1. What was the direction in which a given initial impulse was delivered? If the seventy-five earthquakes we have discussed all

originated from faults which ran north and south and haded to the west, which, however, is not likely, we should have a complete explanation of what has been noted.

2. Has the direction in which a primary impulse was delivered been southwards towards the Equator, or in the direction of the latitude of its origin?

3. Have the wave paths been sub-oceanic or sub-continental? In the first case we have a 'tapping off' of energy by a layer of water, and in the second by a layer of air.

4. The wave movement we are considering has been recorded upon the upper surface of the crust of our earth. To what depth beneath this covering does this movement extend? Are we dealing with a movement which is merely superficial or one which extends to a considerable depth in the material beneath the crust? Are the factors which govern wave speed within our earth the same in all directions?

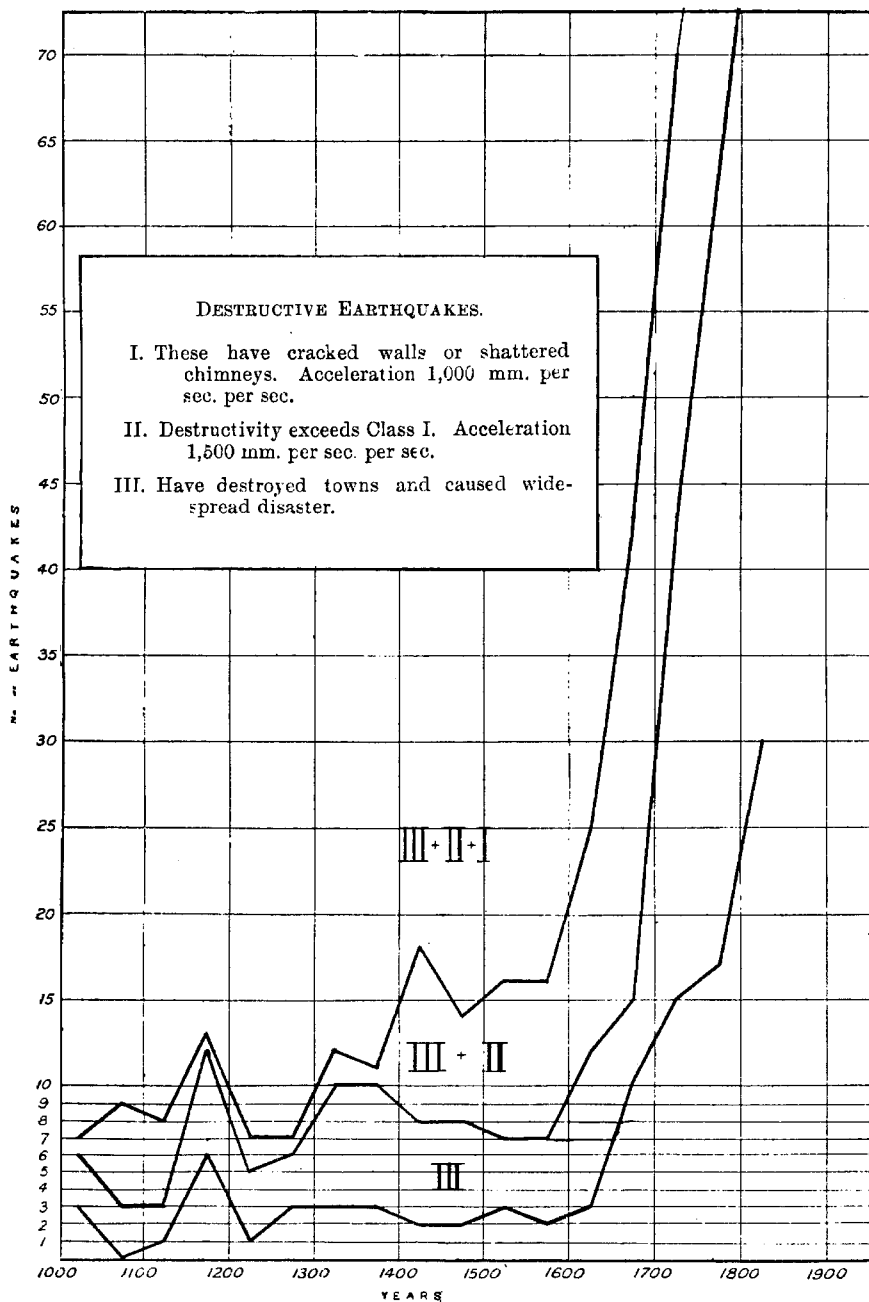
VIII. *A Catalogue of Destructive Earthquakes.*

(Still in preparation.)

The catalogue to which I wish to draw attention only refers to earthquakes which have caused structural damage. The earthquakes which are marked I. are those which have had an intensity sufficient to crack walls or break chimneys. This implies that the acceleration or rapidity of change of motion may have been about 1,000 mm. per second, and the destructivity has usually been confined to a single town or village. Those which are marked II. have had a destructivity so far in excess of Class I. that a few buildings have fallen. For this class the acceleration may be about 1,500 mm. per second, and the area may be represented by a radius of twenty miles. Class III. refers to earthquakes which have destroyed towns or caused widespread disasters. Although these earthquakes have occasionally been local, it is usually found they have been severe 50 or 60 miles round their origin and have produced effects similar to those of Class I. at distances of 200 or 300 miles. It is clear this classification is imperfect; certain earthquakes under Class II. might be included in Class III., whilst others under the head of Class I. might be included in Class II. It is, however, probable there are few mistakes about the entries in Class III. Earthquakes which have been described as slight or feeble, which have wakened up a few people, which have even rattled or broken a few windows, moved furniture, or have been simply described as being very violent, are altogether excluded from the catalogue.

The object of compiling a register of this sort is that it will be more uniform in its character and more nearly up to date than its predecessors. If we turn to large earthquake catalogues which have hitherto been published, as, for instance, those of Mallet and Perrey, in the first place we notice that the material they contain is very heterogeneous in character, and the heterogeneity is variable in different periods. The earlier records they give refer to earthquakes which have devastated districts, or to Class III., whilst as we approach modern times equivalent disturbances are eclipsed by a large number of tremors which have not been sufficiently intense to be included even in Class I. Another factor which tends to disturb the uniformity of the older earthquake registers is the fact that the entries in the same increase in number with the spread of civilisation. For example, records of earthquakes greatly increased about 100 years

FIG. 6.



after the discovery of the two Americas. To this we may add that it has only been of late years that the records of certain countries with an ancient civilisation have become accessible to us. Up to the year 1850 Europe imagined that in Japan there were from one to six earthquakes per year. Now we know there are at least 1,000. We also know that the Japanese have for a long time past published 'Jishin-Nendaiki,' or earthquake calendars, which give records of very destructive earthquakes since extremely early times.

As an illustration of the difference between the new catalogue and the one published by Mallet, who endeavoured to exclude from his registers very small disturbances—such as 'after-shocks'—I find that between 1800 and 1808, which are years taken at random, Mallet gives 407 entries, but of these only thirty-seven are stated to have produced structural damage. All other large catalogues appear to be of the same nature. Large earthquakes which have announced changes of geological importance in the earth's crust stand side by side with great numbers of seismic trivialities, many of which may not even have rattled a window. To give each unit in such collections an equal value, and this has frequently been the case, would not for many analyses lead to satisfactory results. For example, the old catalogues when taken *en bloc*, could hardly be expected to give us accurate information about the distribution of seismic energy in time.

The sources from which material has been obtained to form the present catalogue are various. From A.D. 15 to 1842 I am indebted to Mallet's catalogues, from that date to 1864 I have in great measure relied upon Alex. Perrey. Some of his writings, however, appear to be only in MS., and therefore have not been accessible. To obtain records of the last forty-three years, however, has been a matter of considerable difficulty. Appeals to daily journals like the 'Times' have proved to be very disappointing. For example, the records of large earthquakes in the 'Times' for 1855 and 1864 were respectively five and one, while references to foreign journals and the Transactions of learned societies show that very destructive earthquakes occurred in each of those years from twenty-seven to thirty times.

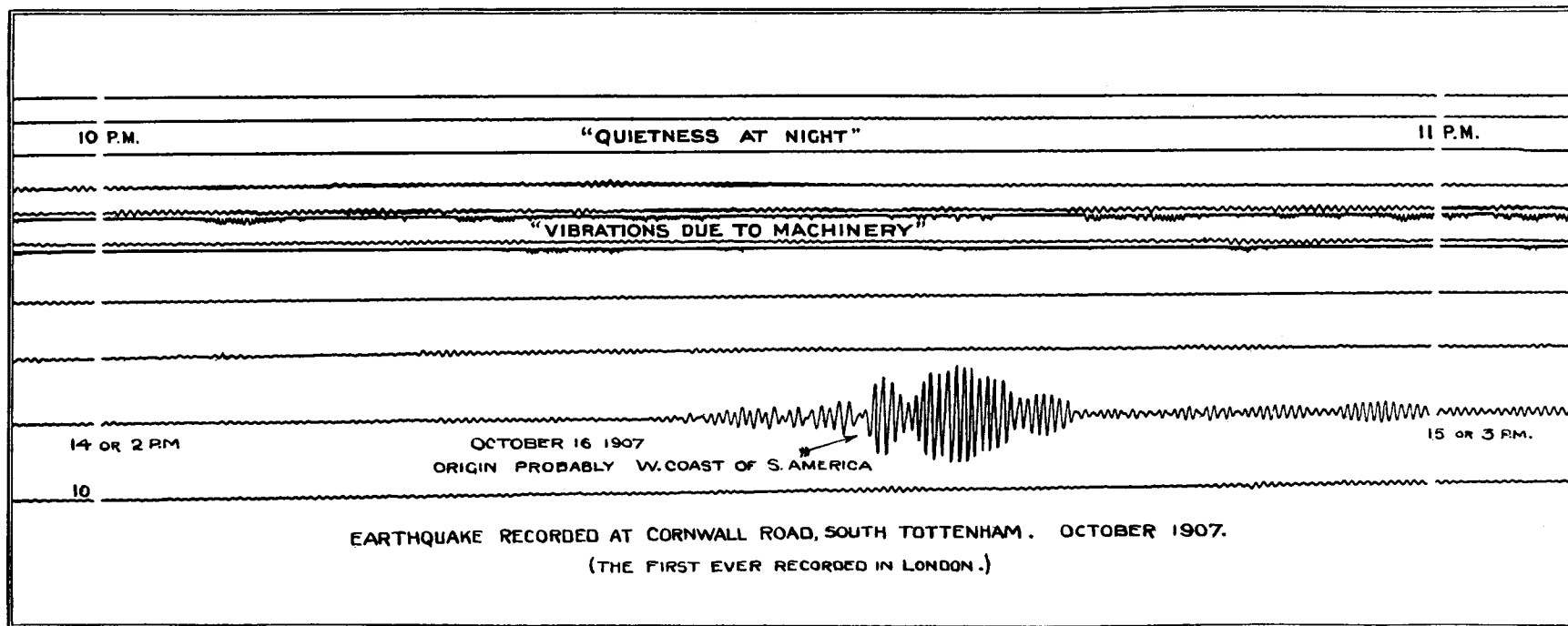
If this catalogue proves to have more homogeneity in its character than its predecessors, it is to be hoped that analyses of the same will lead to more definite results than have hitherto been obtained from earthquake statistics.

An addition to this work is a Catalogue of Chinese Earthquakes. It has been compiled by my assistant, Mr. Shinobu Hirota, and, so far as I am aware, it is the most important collection of records relating to earthquakes in China which have appeared in a European language.

As an illustration, and also as an introduction to analyses which may be made from a catalogue of destructive earthquakes, I give the following:—

*On the Seismicity in Europe and adjacent Countries between the Years
A.D. 1000 and 1850.*

The subjoined table shows the number of very destructive earthquakes which have been recorded between A.D. 1000 and 1850. The grouping is in periods of fifty years. Under the heading marked III. we have the number of exceedingly destructive earthquakes, the records



Illustrating the Report on Seismological Investigations.

of which it is assumed have not been lost to history or tradition. In the next column we find the sum of earthquakes of values III. and II., whilst in the last column is given the sum of earthquakes having an intensity of Classes III., II., and I. The destructivities of Classes I., II., and III. have already been defined.

	III.	II. + II	III. + II. + I.
1000-1050	3	6	7
1050-1100	0	3	9
1100-1150	1	3	8
1150-1200	6	12	13
1200-1250	1	5	7
1250-1300	3	6	7
1300-1350	3	10	12
1350-1400	3	10	11
1400-1450	2	8	18
1450-1500	2	8	14
1500-1550	3	7	16
1550-1600	2	7	16
1600-1650	3	12	25
1650-1700	10	31	42
1700-1750	15	43	70
1750-1800	17	87	169
1800-1850	30	90	202

These figures are also shown as three curves (fig. 6). An inspection of these will show that they have a striking similarity. Between the years 1150 and 1250 each indicates an increase in seismic activity during that period. The next increase commences about the year 1650, since which records even of the most destructive type of earthquake have during successive periods each of fifty years rapidly increased in number. Inasmuch as all these records refer to a European area, it is difficult to imagine that the great increase in numbers from the middle of the seventeenth century should be accounted for by a sudden stimulus to keep better records from that period. Earthquakes of Class III. may be regarded as events of historical importance; and, if this is so, it would seem that records of the very destructive disturbances between A.D. 1300 and 1600 should approximate in their correctness to those which occurred subsequently to the latter date. My own idea is that about 1650 there was a very marked increase in seismic and, I may add, volcanic activity. Whether this has any connection with the observations of geologists or those who study magnetics or other branches of earth physics must be left for their consideration.

IX. *On a Seismogram obtained in London on October 16, 1907.*

The accompanying seismogram, Plate II., was recorded in the engineering workshops of Mr. R. W. Munro, South Tottenham, where an instrument had been set up for examination before shipping for South Australia. Vibrations due to machinery are marked, while at night the instrument yielded a fairly straight line. This steadiness at night, notwithstanding casual traffic, suggests that a seismograph might find a sufficiently steady site in a London square or park. The seismograph is identical with those first adopted by the British Association, the record-receiving surface, however, instead of only moving at 60 mm. per hour now moves at four

times that rate. Because the paper is on a cylinder and not used as a band, about half the quantity of film is employed, an open scale is obtained, and in many cases, owing to the absence of halation due to long exposure, the Slide Registers, as published by the British Association, show that earlier commencements are obtained. With the present receiver, it is distinctly the most satisfactory instrument with which I have had any experience. Its value as a recorder of minute tremors is indicated on p. 64. For a description of the instrument see British Association Report, 1904, p. 44.

X. *Map of the World.* By R. D. OLDHAM.

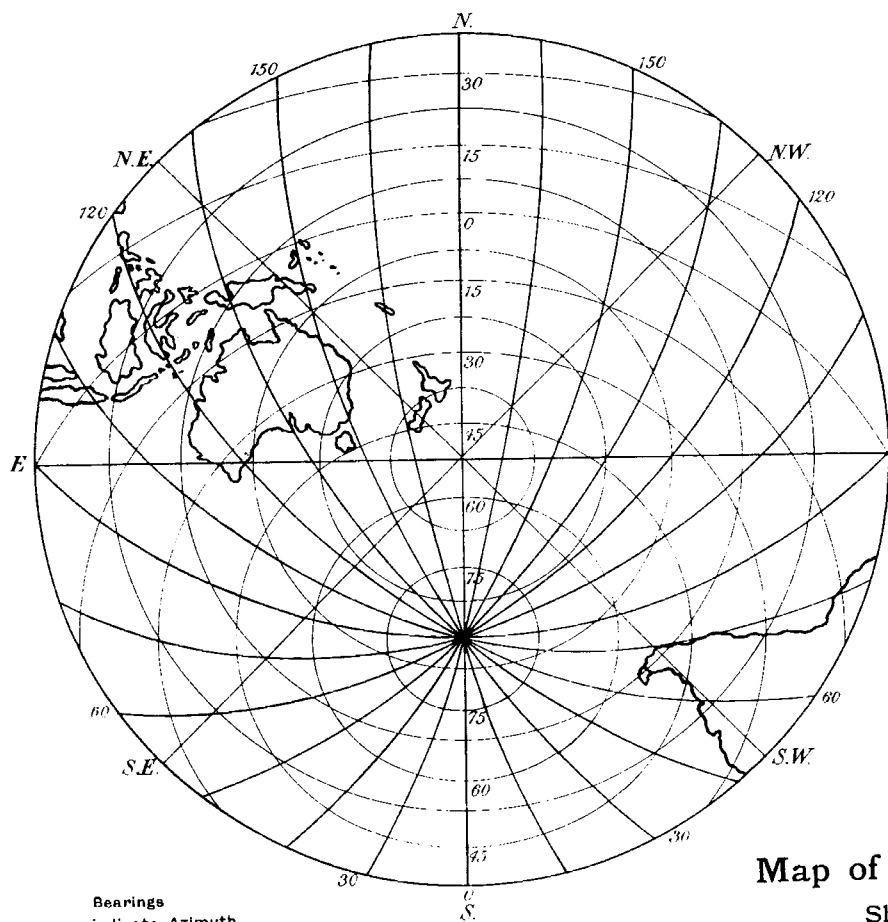
The accompanying map of the world, Plate III., was made by Mr. R. D. Oldham for certain purposes of his own, but as it was thought it might be of general use to seismologists we have, with his consent, added it to this report. Mr. Oldham describes the map as follows:—

'The map is constructed on the zenithal projection, with Greenwich as the centre. All great circles passing through the centre of the map are represented by straight lines, and equal distances measured along these great circles on the surface of the earth by equal radial distances on the map. Meridians and parallels of longitude and latitude are drawn at intervals of 15° , and intervals between the concentric circles represent intervals of 15° of arc, or an average linear distance of 900 nautical miles, or 1,667 kilometres. For convenience, and to avoid excessive distortion, the whole surface of the earth is divided into two hemispheres; in the one, distances are to be measured directly from the centre outwards, in the other they are measured from the circumference inwards, and added to the length of the radius of the map. This represents one quarter of the circumference of the globe. The direction of the straight line drawn from any point to the centre of the map gives the azimuth of the great circle at Greenwich. The map may also be used for obtaining the distance between any two points situated on the same great circle with each other and Greenwich, but cannot be used with accuracy for measurements between two points not so situated.

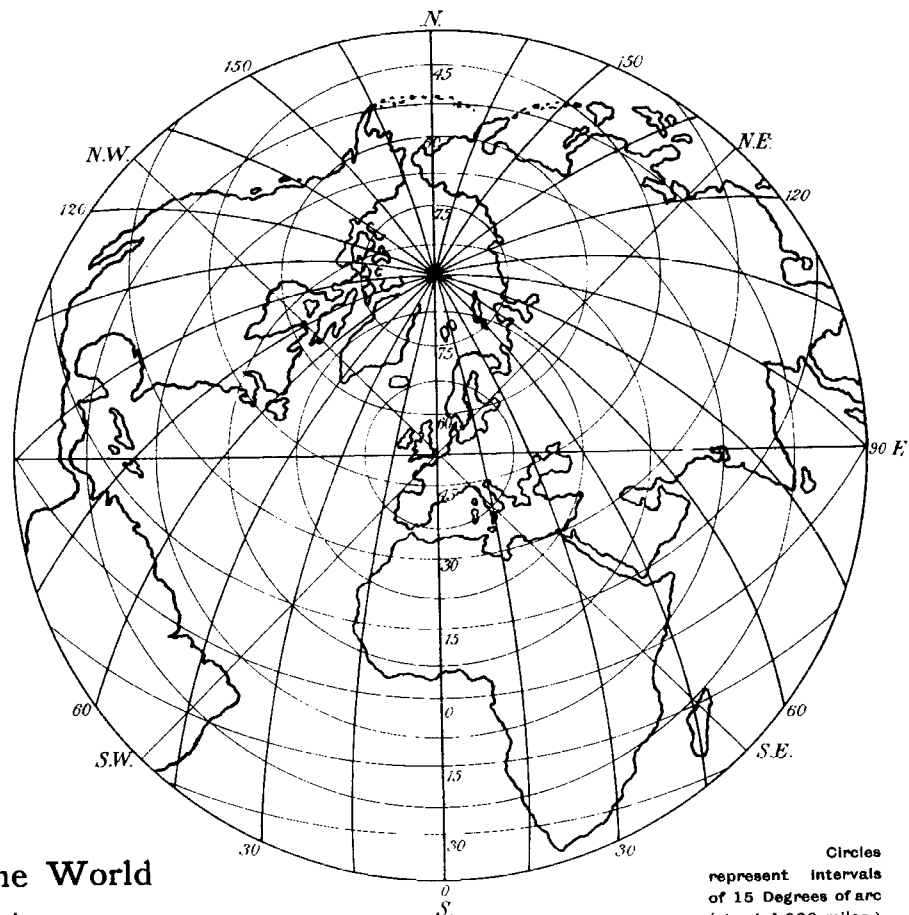
'Though constructed to Greenwich as a centre, it can be used with sufficient accuracy for many purposes for any place in the British Isles or the nearer parts of Europe.'

XI. *A Catalogue of Chinese Earthquakes.* By SHINOBU HIROTA.

In May 1839 Ed. Biot presented to the Académie des Sciences a 'Catalogue Général des tremblements de terre, affaissements et soulèvements de montagnes, observés en Chine depuis le temps anciens jusqu'à nos jours.' This was published in the 'Annales de Chimie et de Physique,' tome ii. 1841, p. 372. It contains references to about 480 earthquakes. In the twenty-ninth volume of the Reports of the Imperial Earthquake Investigation Committee, 1899, Dr. F. Ōmori gives a Catalogue of Chinese Earthquakes. It is printed in Chinese ideographs, and the characters he uses are apparently those in the works from which he quotes. Both M. Biot and Dr. Ōmori quote from the Chinese author Ma-touan-lin, who made a catalogue of earthquakes and the historical annals called Thoung-kien-khang-mou. Dr. Ōmori has also referred to other Chinese histories. By combining these two catalogues one result is that the 480 entries in M. Biot's catalogue is now extended to 889,



Bearings
indicate Azimuth
from Greenwich.



Circles
represent intervals
of 15 Degrees of arc
(about 1,036 miles.)

Map of the World
Showing
Distance and Direction
from
Greenwich.

Illustrating the Report on Seismological Investigations.

the greater number of which are to be found in the catalogue of Dr. Ōmori. The 324 which are common to both, and which refer to the same events, we should expect to find strictly identical, but this is not the case. For example, the names of provinces and places are frequently different. In certain instances this has apparently resulted from the use of old names rather than modern ones. This difficulty was not overcome until we received from Japan a series of fourteen maps which show the various changes which have taken place with regard to the provinces and the names of places since very early times. Another striking difference between these two catalogues is the differences in dates. The dates I prefer to use are those given by Dr. Ōmori. The reason for doing this is that in Japan we are familiar with the Chinese lunar chronological system, and also that tables have been compiled which give the European equivalent of Chinese dates. In cases where differences in dates have exceeded a few days both dates have been given. The first date is a translation of ideographs used by Dr. Ōmori.

Mallet, in his large catalogue of earthquakes published by the British Association in 1852, 1853, and 1854, makes but few references to seismic disturbances in China. When we think of the enormous labour he spent upon the collection of statistics relating to this work, it is difficult to understand how the registers brought together by Biot had escaped his attention.

In the 'Archives des Sciences Physiques et Naturelles,' April 1899, F. de Montessus de Ballore gives us a general description of the distribution of seismic activity in China. However, he does not give us a catalogue of earthquakes. The map which accompanies his paper is based upon the records of Biot and a catalogue by Mouchketoff and Orloff of the earthquakes in the Russian Empire. In the 'Trans. Seis. Soc. Japan,' vol. x. 1887, there is a short Paper on earthquakes in China by Dr. Macgowan. Unfortunately Dr. Macgowan's list of earthquakes was nearly all destroyed by fire, and therefore he is only able to speak in general terms. One curious remark about tremors which were experienced in Chekiang, Kiangsu, and in the western regions is that they are followed by the appearance on the ground of substances which in Chinese books are styled 'white hairs several inches in length, like horse-tail hair.' Dr. Macgowan's impression is that the regions where these appear are all, or nearly all, in alluvial valleys.

Crystallisation of exhalations may be curious, but in making this translation I have met with notes which are equally remarkable. In the fourteenth century the names of two towns, Pingyang and Taiyuan, were changed to Chinning and Chining. This alteration was made by imperial decree with the hope that earthquakes, which had so frequently visited these places, would, as the result of the change, be reduced in their numbers.

In addition to the translation a map has been drawn, on which earthquake centres are indicated. From this we see that earthquakes have been most frequent in the north of Peking, the extreme north of Kansu, along the course of Hoang-Ho, where it divides the provinces of Honan, Shensi, and Shansi, around Nanking, on the coast of Fu-Kiang, and in the centres of Yunnan and Ssuchuan. The high frequency along the Hoang-Ho, particularly at its two great bends, which are respectively near to the Peling Mountains and the Ala Shan Mountains, suggests that the sudden changes in the trend of a valley may be connected with

rock-folding, which from time to time has been accompanied with rock-fracture. No records are given for the extreme west of China or for Mongolia. In all probability this means that these districts were in past time as sparsely inhabited as they are at present. We now know that to the west of China, in Tibet, large earthquakes occur very frequently. I believe this to be the first time that anything approaching a complete catalogue of Chinese earthquakes has appeared in a European language.

Catalogue of Chinese Earthquakes.

B = statement in Bio's 'Catalogue.' The names of provinces are in *italics*.

YEAR.	B.C.		
1	1820		Mount Taishan, <i>Chinan, Shantung</i> . Shock.
2	1185		Fenghsiang Fu, <i>Shensi</i> .
3	618		Ditto
4	557		Ditto
5	523		Ditto
6	519		Ditto
7	492		Ditto
8	466		Taiyuan Fu, <i>Shansi</i> . It lasted seven days, and many killed.
9	233		Earthquake.
10	193	Jan.	Great earthquake, Lunghsi, Kungchang Fu, <i>Kansu</i> . More than four hundred houses were destroyed.
11	186	Jan.	A great earthquake took place at Wutu, south east of Lunghsi, Kungchang Fu, <i>Kansu</i> . The face of a mountain slipped down and about 760 people were killed.
12	175	Feb.	Earthquake.
13	143	May.	Earthquake.
14	131	June.	Earthquake at Chengho, Chienning Fu, <i>Fukien</i> . Many people killed.
15	88	Aug.	Earthquake.
16	72		South of Yellow River, Honan Fu, <i>Honan</i> .
17	70		A great earthquake took place from Honan Fu, <i>Honan</i> , to Pehhai in Laichou Fu, <i>Shantung</i> . Forty-nine prefectures were damaged. More than six thousand killed.
18	68	Sept.	A great earthquake, Lunghsi, Kungchang Fu, <i>Kansu</i> , in which many castle walls, temples, and houses were destroyed; about six thousand people were killed.
19	67	Oct. 12.	Earthquake.
20	47	April 17.	Great earthquake at Lunghsi, Kungchang Fu, <i>Kansu</i> , and Loyang, Honan Fu, <i>Honan</i> . Many castle walls and temples were destroyed and many people were killed.
21	41		Earthquake.
22	39		Earthquake.
23	34		Earthquake.
24	30		Earthquake.
25	26	July 23.	A great earthquake took place at Kienwei, in Chiating Fu, <i>Ssuchuan</i> . Two mountains were displaced and the rocks fell into the river and changed its course. The ground did not come to rest for 21 days, and there were 124 shocks. Many castles, temples, and houses were destroyed, and about thirteen people were killed.
26	A.D. 7	Nov. 10.	Earthquake in the Imperial City, Changan (now Hsian), <i>Shensi</i> , and the northern district. It destroyed more than thirty castle walls, and 415 people were killed.
27	16	March	Earthquake Hsian Fu, <i>Shensi</i> .
28	46	Oct.	Earthquake in forty-two counties. Most damage was done at Nanyang, <i>Honan</i> ; the ground opened and water burst out from the fissures, and many people were killed (B, 42 earthquakes).

ON SEISMOLOGICAL INVESTIGATIONS.

No.	DATE.		
	A.D.		
29	76	April 25.	Earthquake at Tungping (Talan Fu), Shanyang, now Yeichou Fu, <i>Shantung</i> .
30	92	Aug. 8.	Earthquake in thirteen counties and towns.
31	93	April 7.	Earthquake at Lunghsi, Kungchang Fu, <i>Kansu</i> .
32	95	Nov. 8.	Earthquake at the Imperial City, Loyang, Honan Fu, <i>Honan</i> .
33	96		Yiyang, Honan Fu, <i>Honan</i> .
34	97	April 7.	Earthquake at Lunghsi, Kungchang Fu, <i>Kansu</i> .
35	107		Eighteen counties and towns shaken (B, 18 earthquakes).
36	108		Twelve counties were shaken (B, 12 earthquakes).
37	110	Jan. 11.	Nine counties were shaken.
38	110	April 14.	Four counties were shaken.
39	111	Feb. 1.	Ten counties were shaken. (Date given by Biot is slightly different.)
40	113	Feb. 5.	18 counties were shaken.
41	113		18 ditto.
42	114		15 ditto (B, 15 earthquakes).
43	115	Dec. 11.	10 ditto.
44	116	March.	10 ditto.
45	117	Jan. 17	9 ditto.
46	117	Feb.	13 ditto (B, 13 earthquakes).
47	118		14 ditto.
48	119	March 9.	Earthquake at the Imperial City, Loyang, Honan Fu, <i>Honan</i> . It was felt over forty-two counties; the ground was cracked, many castle walls and houses were destroyed and many killed.
49	119	Winter.	Eight counties were shaken.
50	120		Twenty-three counties were shaken.
51	121	Oct. 8.	Thirty-five counties were shaken and towns damaged. The land was cracked, many castle walls and houses were damaged, and many people were killed.
52	122	June 21	Earthquake at the Imperial City, Loyang, Honan Fu, <i>Honan</i> , and in thirteen counties.
53	122	Oct. 23.	An earthquake in twenty-seven counties, and towns were shaken.
54	123		Earthquake at the Imperial City, Honan Fu, <i>Honan</i> , and in thirty-two counties (B, 32 earthquakes).
55	124		Earthquake at the Imperial City, Honan Fu, <i>Honan</i> , and in twenty-three counties (B, 23 earthquakes).
56	125		Earthquake at the Imperial City, Honan Fu, <i>Honan</i> , and in sixteen counties (B, 16 earthquakes).
57	128		Earthquake at the Imperial City and Hanyang, now Fuchiang, Kanchang Fu, <i>Kansu</i> . At Hanyang great damage was done, and many people were killed and water burst out from the ground.
58	133	June 18.	Earthquake at Imperial City, Loyang, Honan Fu, <i>Honan</i> .
59	136	Feb. 18.	Ditto.
60	137	May.	Ditto.
61	137	Dec. 21.	Ditto.
62	138	Feb. 28.	Earthquake at Imperial City and Chinching, Lanchou Fu, Lunghsi, Kungchang Fu, <i>Kansu</i> . Many castle walls and houses were destroyed and many people were killed.
63	138	June 2.	At the Imperial City, Loyang, Honan Fu, <i>Honan</i> .
64	139	April 23	Ditto.
65	140	April 2.	Ditto.
66	144	Feb.	A great earthquake took place at Liangchou Fu, <i>Kansu</i> , and six neighbouring districts; the ground did not come to rest from October last year to April this year, about 180 days. The land opened and mountains were displaced; many houses were destroyed and many people were killed.
67	144	Oct. 24.	Earthquake at Imperial City, Loyang, Honan Fu, <i>Honan</i> .
68	147	May 26.	Ditto.
69	147	Oct. 31.	Ditto.

No.	DATE.		
	A. D.		
70	149	Oct. 31.	Earthquake.
71	149	Nov. 11.	Earthquake. Same year fourth moon there were several earthquakes at six places.
72	151	Dec. 23.	Earthquake at the Imperial City, Loyang, Honan Fu, <i>Honan</i> .
73	152	Feb.	Ditto.
74	152	Dec. 11.	Ditto.
75	154	March 4.	Ditto.
76	156		Earthquake.
77	156	Aug.	Hotung (now Pingyang Fu, Puchou Fu), <i>Shansi</i> .
78	156	Dec.	Earthquake at the Imperial City, Loyang, Honan Fu, <i>Honan</i> .
79	161		Loyang, <i>Honan</i> , Fenghsiang Fu, <i>Shensi</i> , and Liangchou Fu, <i>Kansu</i> .
80	162	June 21.	Earthquake at the Imperial City, Loyang, Honan Fu, <i>Honan</i> .
81	165	Nov. 4.	Ditto.
82	167		Pingyu, Loyang (now Honan Fu), <i>Honan</i> , Kaoping, Tsechou Fu, <i>Shansi</i> .
83	171	April 3.	Earthquake in Hotung, Pingyang Fu, Puchou Fu, <i>Shansi</i> .
84	173	July.	Ditto.
85	177	Nov.	Ditto.
86	178	Mar. 26.	Ditto.
87	178	May 10.	Ditto.
88	179	April.	Earthquake at the Imperial City, Loyang, Honan Fu, <i>Honan</i> .
89	180	Jan.	A great earthquake at Chiuchuan, in Kanchou Fu, <i>Kansu</i> . The ground did not come to rest until spring next year. There were about eighty shocks. Water burst out from the ground, many houses were destroyed, and many people were killed.
90	191	July 30.	Earthquake.
91	194	July 6.	Ditto. [Between the years 195 and 225 no records were kept on account of the great Rebellion.]
92	225		Chiangtung (Nanking), <i>Kiangsu</i> .
93	234	Dec.	Loyang (Honan Fu), <i>Honan</i> . Many houses were destroyed.
94	237	June.	Chiangtung (now Nanking), <i>Kiangsu</i> .
95	237	July.	Loyang (Honan Fu), <i>Honan</i> , and Nanking. Many houses were destroyed.
96	239	Feb.	Two earthquakes.
97	241	Dec.	Nanan, Kungchang, <i>Kansu</i> .
98	242	Aug. 31.	Ditto.
99	243	Jan.	Wei district, Changte Fu, <i>Honan</i> (northern part of).
100	245	Mar. 31.	Nanan, Kungchang Fu, <i>Kansu</i> .
101	248		Chiangtung (Nanking), <i>Kiangsu</i> .
102	263		Shu (Chengtü), <i>Ssuehuan</i> .
103	264		Earthquake at Shu, comprising the west part of <i>Ssuehuan</i> . It was the Imperial residence. Now forming Chengtu.
104	269	May 18.	Earthquake.
105	271	April 3.	Earthquake, Loyang, Honan Fu, <i>Honan</i> .
106	276	Aug. 28.	Honan Fu, <i>Honan</i> ; Hotung (comprising Puchou Fu, Pingting, Chiang, Ho, and Chieh) and Pingyang Fu, <i>Shansi</i> (B, July 6).
107	278	July 16.	Earthquake at Yinping Fu (now Lungan Fu), <i>Ssuehuan</i> , and Kuangwu, Ninghsia Fu, <i>Kansu</i> .
108	278	Aug. 2.	Earthquake at Yinping Fu (now Lungan Fu), <i>Ssuehuan</i> .
109	281	Mar. 15.	Earthquake at Huainan (now Ho), Taiping Fu, <i>Anhui</i> , and Tanyang (comprising Chenchiang Fu, <i>Kiangsu</i> , and <i>Anhui</i>).
110	284	April.	Earthquake at the Imperial City, Loyang, Honan Fu, <i>Honan</i> .
111	285	Aug.	Earthquake, Nanyung Fu, <i>Honan</i> .
112	285	Sept. 9.	Nanking, <i>Kiangsu</i> .
113	286	March.	A violent earthquake took place at Chushih (now Chengtu Fu, Chiating Fu), and Yinping, Lungan Fu, <i>Ssuehuan</i> . There was a great landslip, and many houses were destroyed. At Yingping a dam was destroyed.

No.	DATE.		
	A. D.		
114	286	Aug.	Earthquake at Kienwei and Nanan, in Chiating Fu, <i>Ssuehuan</i> .
115	286	Sept.	Earthquake at the Imperial City, Loyang (now Honan Fu), <i>Honan</i> .
116	287	June.	Earthquake at Kienan, Chienning Fu, <i>Fukhien</i> .
117	287		Earthquake at Yinping, Lungan Fu, <i>Ssuehuan</i> .
118	287	Aug.	Earthquake at Tanyang (comprising Chenchiang Fu, <i>Kiangsu</i> , and Taiping Fu, <i>Anhui</i>).
119	288	Feb.	Earthquake at Kueichi (comprising <i>Chehkiang</i> , see Shaohsing Fu, the south of <i>Anhui</i> , and the north of <i>Fukhien</i>), Tanyang, Taiping, <i>Anhui</i> , and Wubsing (now Huchou Fu), <i>Chehkiang</i> .
120	288	June 7.	Earthquake at Changsha Fu, <i>Hunan</i> , Nanhai, Canton, Kuangchou Fu, and eight neighbouring districts, <i>Kuangtung</i> .
121	288	July-Aug	Earthquake. Four more shocks, and three of them accompanied by noise.
122	288	Oct.	Earthquake at Linho, Pingle Fu, <i>Kuangsi</i> .
123	289	Jan.	Ditto.
124	290	Oct. 6.	Earthquake in Tanyang, Taiping Fu, <i>Anhui</i> .
125	291	Jan.	Ditto.
126	291	Jan. 18.	Earthquake at Loyang (now Honan Fu), <i>Honan</i> (B, 292, January 18).
127	294	March.	Earthquake at Liaotung, <i>Shingking</i> , Shangku, Hsuanhui Fu, north of <i>Chihli</i> , and Shangyang, in Chingchou Fu, <i>Hupeh</i> .
128	294	June.	Earthquake at Shu, Chengtu Fu (comprising west part of <i>Ssuehuan</i>). A mountain was shaken down, water burst out from the ground, and many people were killed.
129	294	Sept.	Earthquake at Shangku, Hsuanhua Fu (comprising the north part of <i>Chihli</i>). The ground was fissured and water burst out from the cracks, and about 100 people were killed.
130	294	Nov.	Earthquake at the Imperial City, Loyang (now Honan Fu), <i>Honan</i> .
131	294	Dec.	Earthquake at Kaifeng and Nanyang, Kia. The whole of <i>Honan</i> .
132	295	Jan.	Earthquake at the Imperial City, Loyang, <i>Honan</i> .
133	295	June.	Earthquake.
134	295	July.	Earthquake at Chincheng, in Lanchou Fu, <i>Kansu</i> .
135	296	Mar. 12.	Earthquake.
136	298	Feb.	Earthquake at Ching, in Hochien Fu, <i>Chihli</i> , and Chenchou Fu, <i>Hunan</i> (B, March 6).
137	302	Jan.	Earthquake.
138	303	Dec.	Ditto.
139	304	Jan.	Ditto.
140	309	Nov.	Earthquake at Hsiangyang and Chingchou, <i>Hupeh</i> .
141	310	May.	Earthquake in Yenchou, <i>Shantung</i> , and Hsian Fu, <i>Shensi</i> .
142	314	May 6.	Earthquake.
143	315	July 23.	Earthquake at Changan, in Hsian Fu, <i>Shensi</i> .
144	318	May.	Earthquake at Hsiping, in Juning Fu, <i>Honan</i> . Water burst out. Same time at Kungchang Fu, <i>Kansu</i> , and Wuchang Fu, <i>Hupeh</i> .
145	319	Jan.	A great earthquake at Luling, in Chian Fu, Yuchang (literary name of <i>Kiangsi</i>), Wuchang, and Hsiling (now Yichang Fu), <i>Hupeh</i> . A mountain shattered and water burst out.
146	319	June.	Earthquake at Chishan, in Taiyuan Fu, <i>Shansi</i> . Great landslip, and many people killed.
147	320	May.	Earthquake at Tanyang, in Chenchiang Fu; Wu, in Suchou Fu; Tsinling (now Changchou Fu), <i>Kiangsu</i> .
148	327	March.	Earthquake at Chiangling, Chingchou Fu, <i>Hupeh</i> .
149	327	April.	Earthquake at Yichou, comprising parts <i>Yunnan</i> and Lungan Fu, <i>Ssuehuan</i> .
150	327	May 13.	Yuchou (now forming Taiping Fu, <i>Anhui</i>).
151	332	April.	Kueichi, comprising Huchou, <i>Chehkiang</i> (Shaohsing), Taiping Fu, <i>Anhui</i> , and the north of <i>Fukhien</i> .

No.	DATE.		
	A.D.		
152	334	May 14.	Kueichi, comprising <i>Chehkiang</i> , the south of <i>Anhui</i> , and the north of <i>Fukkien</i> .
153	345	Aug. 10.	Earthquake, Loyang, Honan Fu, <i>Honan</i> .
154	347	Jan.	Ditto.
155	347	Feb.	Earthquake, Kengcheng, Puchou Fu, <i>Shansi</i> .
156	347	Oct.	Ditto.
157	348	Nov. 18.	Ditto.
158	349	Feb. 17	Ditto.
159	353	Oct. 1.	At the Imperial City, Kienyeh or Nanking (now Chiangning), <i>Kiangsu</i> , accompanied by a noise like thunder.
160	354	Feb. 28.	Earthquake with a noise like thunder. Hens and pheasants cried before the earthquake.
161	355	May 12.	Earthquake.
162	355	June 3.	Ditto.
163	358	Dec.	Ditto.
164	361	Sept.	Liangchou Fu, <i>Kansu</i> .
165	362	May 24.	Earthquake.
166	363	May 19.	Yangchou Fu, <i>Kiangsu</i> . Water became muddy in ponds, which overflowed.
167	364	April 23.	Kiangling, Chingchou Fu, <i>Hupei</i> (B, March 29).
168	366	March.	Liangchou, <i>Kansu</i> . Water burst out.
169	372	Nov. 24.	Ancheng (now Chian Fu), <i>Kiangsi</i> .
170	373	Nov. 19.	Earthquake.
171	374	March 1.	Ditto.
172	374	Aug.	Liangchou, <i>Kansu</i> . A mountain slipped down.
173	377	May 13.	Earthquake.
174	377	July 6.	Ditto.
175	386	July 22.	Ditto.
176	390	April 2.	Ditto.
177	390	Aug.	At the Imperial City, Pingcheng, Taiyuan Fu, <i>Shansi</i> , and Nanking.
178	391	Feb. 6.	Earthquake.
179	392	July 14.	Ditto.
180	393	Jan. 26.	Ditto.
181	393	Jan. 30.	Ditto.
182	393	Mar. 27.	Earthquake (B, March 2).
183	400	May 25.	Earthquake.
184	400	Oct. 10.	Ditto.
185	408	Mar. 1.	Earthquake. A noise was heard.
186	408	Nov. 7.	Earthquake.
187	409	Feb. 10.	Hsunyang (now Chiuchiang Fu), <i>Kiangsi</i> . With a noise like thunder.
188	412	Jan.-Ap.	Nankang Fu and Luling, in Chian Fu, <i>Kiangsi</i> . Shocks occurred four times a day.
189	414	April 25.	Earthquake.
190	420	Aug. 6.	Ditto (B, Sept. 10).
191	435	May.	Imperial City, Nanking, <i>Kiangsu</i> .
192	438	Aug. 10.	Earthquake.
193	458	May 27.	Ditto.
194	462	Aug. 23.	Earthquake, with a noise like thunder. Most damage was done at Yenchou, in Lu, comprising the south part of <i>Shantung</i> .
195	476	June	Earthquake.
196	477		Ditto.
197	499	Aug.	Earthquakes night and day till next year. Many small houses were destroyed.
198	507	Jan.	Kienyeh, now Chiangning Fu, <i>Kiangsu</i> .
199	522	Feb.	Kienkang, in Chiangning Fu, <i>Kiangsu</i> . Present name is Nanking (the Imperial City).
200	526	Jan.	Earthquake, Nanking, <i>Kiangsu</i> .
201	533	Feb.	Earthquake, Kienkang, <i>Kiangsu</i> (now Chiangning).
202	537	Nov.	Ditto.

No.	DATE.		
	A.D.		
203	537	Dec.	Earthquake, Kienkang, <i>Kiangsu</i> (now Chiangning).
204	541	March.	Ditto.
205	543	Feb.	Ditto.
206	546	Jan.	Ditto.
207	549	May.	Kienkang, two earthquakes.
208	558	June.	Earthquake at Kienkang, <i>Kiangsu</i> (now Cuiangning).
209	563		Pinglieh, Chengte Fu, <i>Chilli</i> .
210	572	Nov.	Earthquake, Pingchou, now <i>Shansi</i> (see 'Taiyuan Fu').
211	573		Liangchou Fu, <i>Kansu</i> . Many castles and houses destroyed.
212	587	March.	Earthquake. [Biot says from the year 402 to 587 civil war interfered with keeping of registers.]
213	594	June.	The Imperial City, Changan, Hsian Fu, <i>Shensi</i> .
214	600	Dec. 16.	All China was shaken.
215	602	April.	Chiyung (now Fenghsiang Fu), <i>Shensi</i> .
216	619	Nov.	Imperial City, Changan, Hsian Fu, <i>Shensi</i> .
217	624	July.	Tsunchou (now Changyang), in Wuchang Fu, <i>Hupeh</i> . Ground slipped down from mountains and a river overflowed.
218	633	Nov. 30.	Imperial City, Changan, Hsian Fu, <i>Shensi</i> .
219	638	Feb. 15.	Sung and Tsung, Lungan Fu, <i>Ssuchuan</i> . Many houses destroyed. (One book gives the date as the 22nd)
220	646	Nov. 8.	Lingchou, Ninghsia, <i>Kansu</i> . It made a noise like thunder. (One book gives the date as the 15th.)
221	649	Sept. 15.	Hotung, comprising Puchou Fu, Pingling, Chiang-Ho, Chieh, <i>Shansi</i> . Most damage occurred at Puchou; more than fifty people killed. (One book gives the date as Aug. 1st.)
222	649	Sept. 17.	Earthquake, ditto. (One book gives the date as the 3rd.)
223	650	Jan. 5.	Ditto.
224	650	May 9.	Ditto.
225	650	May 19.	Ditto.
226	650	July 19.	Earthquake. Made a noise like thunder.
227	651	Nov.	Ditto.
228	652	Jan. 8.	Tinghsiang, Hsin, <i>Shansi</i> .
229	677	Feb. 29.	Imperial City, Changan, Hsian, <i>Shensi</i> (B, April 25).
230	680	Nov. 9.	Earthquake, ditto.
231	682	Nov. 13.	Ditto.
232	686	Sept.	Hsingfeng, Kanchou Fu, <i>Kansu</i> (B, earthquake?). Mountain displaced and water rose to a height of 20 feet.
233	687	Aug. 29.	Imperial City, Changan, Hsian, <i>Shensi</i> (B, Oct. 25).
234	688	Aug. 6.	Ditto.
235	688	Sept. 16.	Shentu.
236	694	May 7.	Changchou Fu, <i>Kiangsu</i> .
237	705	July 2.	Yangchou Fu, Changchou Fu, Jun (now Chenchiang), and Suchou Fu in <i>Kiangsu</i> . These places are at opposite sides of the river Yangtze.
238	706		Chiennan and six other districts, <i>Ssuchuan</i> . Chiennan is now called Chentu.
239	710	July 2.	Yengchou Fu, <i>Kiangsu</i> (B, June 23).
240	712	Feb. 18.	Pingyang Fu, Fenchou Fu, Chiang, in <i>Shansi</i> . Many houses destroyed, and more than a hundred people killed.
241	729	May 21.	Earthquake and thunderstorm at Lantien, Hsian, <i>Shensi</i> . A mountain was displaced.
242	734	Mar. 24.	Chinchou (now Kungchang), <i>Kansu</i> . The shock was followed by many loud noises; many houses were destroyed, and about four thousand people were killed.
243	738	April 23.	Imperial City, Changan, Hsian Fu, <i>Shensi</i> .
244	756	Dec. 1.	Hohsi (north-west of Ninghsia Fu, <i>Kansu</i>), Changyeh, in Kanchou, and Chiuchuan (now Suchou Fu), <i>Kansu</i> . It was followed by a loud noise. The greatest damage occurred at Changyeh and Chiuchuan, where many houses were destroyed, and many people lost their lives. The ground did not come to rest until March, 757

No.	DATE		
	A.D.		
245	767	Dec. 25.	Imperial City, Changan, Hsian Fu, <i>Shensi</i> . Motion was from N.E., and a loud noise was repeated three times.
246	768	May.	Imperial City, Changan, Hsian Fu, <i>Shensi</i> (B, July 2).
247	777		In the Tingho Circuit, <i>Chihli</i> . The greatest damage was at Tzuku, in Paoting Fu, and Ningchin. The land was fissured, and sand and water were ejected. Many houses were destroyed and many people were killed. The ground did not come to rest for many days.
248	780	May 17.	Imperial City, Changan, Hsian, <i>Shensi</i> .
249	782	July 31.	Ditto.
250	783	May 27.	Ditto.
251	783	July 3.	Ditto. (B, June.)
252	786	June 25.	Ditto.
253	788	Jan. 13.	Tungtu (now Honan Fu), Shan, in <i>Honan</i> , and Fu, in Hsi, <i>Shansi</i> .
254	788	Feb. 16.	Imperial City.
255	788	Feb. 17.	
256	—	Feb. 18.	
257	788	Mar. 4.	The whole of China was shaken, but the most damage was done at Kin, in <i>Hunan</i> , and Fang, in Yunyang Fu, <i>Hupei</i> . A mountain was displaced, the ground opened, and water gushed forth, many houses were destroyed, and people lived in the open air until movement had ceased.
258	788	Mar. 7.	
259	788	Mar. 11.	
260	788	Mar. 14.	
261	788	Mar. 15.	
262	788	Mar. 16.	
263	788	Mar. 18.	Imperial City. (B, Feb. 13, 14, 29; also March 1, 3, 6, 7, and 8.)
264	788	Mar. 20.	
265	788	Mar. 21.	The whole of China. The Imperial City was destroyed. (B, March 17, 18, 29; April 16, 21; May 2, 3; also June 27 and 28.)
266	788	April 1.	
267	788	April 20.	
268	788	April 25.	
269	788	May 6.	
270	788	May 7.	
271	788	July 1.	
272	788	July 2.	
273	788	Sept. 27.	The Imperial City. The shocks were followed by noise like thunder.
274	788	Oct. 3.	Imperial City.
275	792		Earthquake.
276	793	May 31.	Imperial City and neighbouring districts. Most damage was done at Hochung Fu (Puchou Fu), <i>Shansi</i> , and Kuannei, <i>Shensi</i> . Many of the castle walls and houses were destroyed. The ground opened and water burst forth.
277	794	May 13.	Imperial City.
278	794	May 18.	Ditto.
279	797	Aug. 12.	Ditto.
280	812	Sept.	Imperial City. Many trees fell down.
281	814	April 5.	Suichou, Lichiang Fu, <i>Yunnan</i> . During a day and night there were more than eighty shocks. There was a landslip thirty Chinese miles (about ten miles) in length, and more than a hundred people were killed.
282	815	Nov.	Imperial City, Changan, Hsian, <i>Shensi</i> .
283	816	Mar. 23.	Imperial City (B, April 12).
284	820	Jan.	Imperial City, Changan (B, March 13).
285	828	Feb. 7	Imperial City, Changan.
286	833	July 12.	Imperial City, Changan (B, August 4).
287	835	April 15.	Imperial City, Changan. Many tiles shaken down from roofs.
288	836	Feb. 28.	Imperial City.
289	837	Feb. 10.	Imperial City (also a slight shock in old Tungshu).
290	839	Dec.	Imperial City.
291	842	Mar. 17.	Sung and Po, now forming Honan Fu, <i>Honan</i> (B, 843, March 8.)
292	843	Feb. 13.	Imperial City, Changan, Hsian Fu, <i>Shensi</i> .
293	844	Jan. 16	Earthquake.

No.	A. D.	DATE.	
294	849	Oct. 24.	Shangtu (also called Luanching), <i>Chihli</i> , also Chenwu, Kueihuacheng, Soping Fu, <i>Shansi</i> , Hosi (now Chaoyi), in Hsian Fu, Tiente, Lingwu in Hsienyang and Yenhsia, <i>Shensi</i> . Many houses destroyed and many people killed (B, 848, Oct. 25).
295	858	Oct. 13.	Taiyuan in Chinning, <i>Shansi</i> .
296	860	May	Shangtu, <i>Chihli</i> .
297	865	Dec.	Chin, Chiang in Hotung (Taiyuan Fu), <i>Shansi</i> . Many houses destroyed; the ground was cracked and water came forth.
298	867	Feb. 23.	Hochung, Puchou Fu, Chin and Chiang, Taiyuan Fu, in <i>Shansi</i> . Many houses destroyed and many people killed.
299	872	May 15.	Chetung and Chesi, Hangchou Fu, <i>Chehkiang</i> .
300	876	July 18.	Hsiungchou in Paoting Fu, <i>Chihli</i> . The town was destroyed; a landslip took place, many people were killed, and shocks continued for four months.
301	876	July	Puchou, Tsaechou Fu, <i>Shangtung</i> .
302	876	Dec.	Imperial City, Changan, Hsian Fu, <i>Shensi</i> . Shocks were accompanied by sounds.
303	877	Aug. 7.	Hsingchou in Paoting Fu, <i>Chihli</i> .
304	879	March.	Imperial City. Followed by a loud noise like thunder. A mountain was displaced and water burst out at Lantien in Hsian Fu, <i>Shensi</i> .
305	883		Chinchou, Taiyuan Fu, <i>Shansi</i> . It was followed by a noise like thunder.
306	886	Spring.	Chengtou in <i>Ssuehuan</i> . Many shocks during a single month.
307	887	Jan.	Weichou, comprising the lower part of <i>Shansi</i> (Puchou Fu) and part of <i>Honan</i> .
308	895	April 11.	Hotung, now <i>Shansi</i> (Puchou Fu, Pingyang Fu).
309	924	Dec.	Chenchou, <i>Kuangtung</i> .
310	925	Dec. 18.	Wei (now Changyin), Honan Fu, <i>Honan</i> ; Po in Tungchang, <i>Shangtung</i> ; Hsuehou Fu, <i>Kiangsu</i> ; Su in Fengyang Fu, <i>Anhui</i> .
311	928	July	Cheng in Kaifeng Fu, <i>Honan</i> .
312	932	July	Taiyuan in <i>Shansi</i> . The ground did not come to rest until the 27th, and there were twenty shocks.
313	932	Sept.	Chin (now Kungchang), <i>Kansu</i> .
314	932	Dec.	Imperial City, Kaifeng, <i>Honan</i> .
315	949	May 9.	Yuting (now Yungping Fu), Tsuang in Tientsin Fu, Shen in Chinho, and Pei in Kuangping Fu, <i>Chihli</i> . Most damage was done at Yuting.
316	953	Nov.	Wei (now Changyin), Shangte Fu, Lo (Honan Fu), <i>Honan</i> , and Hsing (now Shunte Fu), <i>Chihli</i> . Most damage at Weichou. There were about fifteen shocks, and the ground did not come to rest for several days.
317	965		Imperial City, Kaifeng Fu, <i>Honan</i> .
318	996	Oct.	Tung (now Tzutung), Paoning Fu, <i>Ssuehuan</i> ; Kuansi forming <i>Shensi</i> (Hsian); Ling in Ninghsia Fu, <i>Kansu</i> ; Hsia (Puchou), forming <i>Lower Shansi</i> (Pingyang Fu), Huan and Ching in Chingyang Fu, <i>Kansu</i> . Many castle walls and houses were destroyed.
319	999	Oct.	Changchou Fu, containing the cities of Wuchin and Yanghu in <i>Kiangsu</i> . Many military stations and houses were destroyed.
320	1001	Sept.	Chingchou (now Chingyung), <i>Kansu</i> .
321	1003	Feb.	Yichou, comprising parts of <i>Yunnan</i> and <i>Ssuehuan</i> (Chengtou Fu).
322	1004	Feb. 10.	Imperial City, Kaifeng, <i>Honan</i> .
323	1004	Feb. 17.	Ditto.
324	1004	Feb. 21.	Imperial City, Kaifeng, <i>Honan</i> . Many houses badly shaken, and there was a great noise.
325	1004	Feb. 27.	Chichou, comprising <i>Chihli</i> (Chengting), <i>Shansi</i> , and part of <i>Honan</i> and <i>Manchuria</i> .

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326	1004	March.	Yichou, comprising parts of <i>Yunnan</i> and <i>Ssuehuan</i> (Chengtu), Lichou in Linan Fu, <i>Funnan</i> , and Yachou in <i>Ssuehuan</i> .
327	1004	April.	Chingchou Fu, <i>Hupeh</i> .
328	1004	May 23.	Yingchou (now Hochien Fu), <i>Chihli</i> .
329	1004	June.	Chingchou Fu, <i>Hupeh</i> . Shocks were repeated several times.
330	1004	Dec. 22.	Jihnan (now called Yuenan), <i>Tongking</i> . The shock extended to the Imperial City, Kaifeng, <i>Honan</i> .
331	1004	Dec. 23.	Shihchou, Wenchow Fu, <i>Chehkiang</i> .
332	1007	Sept. 12.	Yichou, comprising parts of <i>Yunnan</i> and <i>Ssuehuan</i> (Chengtu).
333	1007	Sept. 15.	Weiichou (now called Kungchang) and Wating, Pingliang Fu, <i>Kansu</i> . During the day there were four shocks.
334	1009	April.	Taichou, north part of <i>Shansi</i> .
335	1011	July.	Changchou and Meichou, Ningyuan Fu, <i>Ssuehuan</i> .
336	1011	August.	Chengching (now called Chingting) in Chingho, <i>Chihli</i> . Overturned walls.
337	1022	March.	Liao, Ying, in Tatung Fu, and Yuan, in Chiang, <i>Shansi</i> . Many houses were destroyed.
338	1027	May 12.	Taichou in Yangchou Fu, <i>Kiangsu</i> , and Hsin, <i>Shansi</i> .
339	1029	Dec. 5.	Imperial City, Kaifeng Fu, <i>Honan</i> (B, Nov. 29).
340	1037	Dec.	Taichou, Pingchou (Taiyuan Fu), and Hsinchou. These places are in the north part of <i>Shansi</i> . The greatest damage was done at Hsinchou, where 19,742 people were killed, 5,655 were wounded, and more than 50,000 cattle were killed. At Taichou 759 people were killed, and at Pingchou 1,890 people killed (B, Jan. 24, 1038).
341	1038	Jan.	Imperial City, Kaifeng, <i>Honan</i> . (One book gives date as Dec. 1037.)
342	1038	Mar. 7.	Tai, Ping and Hsinchou, <i>Shansi</i> . This is where the earthquake took place in December 1037.
343	1038	Dec.	Hsinchou, <i>Shansi</i> .
344	1039	Jan. 5.	Imperial City, Kaifeng Fu, <i>Honan</i> .
345	1043	June 19.	Hsinchou, <i>Shansi</i> . Followed by a loud noise.
346	1043	June 24.	Hsinchou, <i>Shansi</i> .
347	1045	Sept. 3.	Kuangchou or Cantong Fu, <i>Kuangtung</i> .
348	1045	Sept. 9.	Kingnan and Yochou, <i>Hunan</i> .
349	1046	Feb. 12.	Chingchou Fu, <i>Shantung</i> (B, April 6).
350	1046	April 24.	Tongchou Fu, <i>Shantung</i> . A mountain was displaced and there was a noise in the sea.
351	1046	June 17.	Imperial City, Kaifeng Fu, <i>Honan</i> .
352	1047	Nov. 20.	Ayang and Hsuehou, <i>Honan</i> .
353	1050	Dec. 6.	Hsiuchou, Chian, <i>Kiangsi</i> . A loud noise like thunder came from the north-west.
354	1056	Jan. 4.	Chiahhsing Fu, <i>Chehkiang</i> .
355	1057		Hsiungchou in Paoting Fu and Pachou in Shuntien Fu, <i>Chihli</i> . The greatest damage was at Yuchou in the northern part of Hsiungchou. More than twenty or thirty thousand people were killed.
356	1060	June 8.	Imperial City, Kaifeng Fu, <i>Honan</i> .
357	1067		Chuanchou, Changchou, Chienchou, Shaowu, Hsinghuachun, in <i>Fukien</i> , and Chaochou Fu, in <i>Kuangtung</i> . Most damage was done at Chaochou Fu: the ground opened, water burst forth, and many people were killed.
358	1067	Oct. 10.	Imperial City, Kaifeng Fu, <i>Honan</i> .
359	1068	Aug. 20.	Ditto.
360	1068	Aug. 21.	Ditto.
361	1068	Aug. 27.	Ditto.
362	1068		Hui and Tunga in Yuchou (now called Tungping), Tai'an Fu, <i>Shantung</i> . Shocks were repeated all day; a violent earthquake occurred at Tsangchou, Chingchih and Mochou, Hochiar Fu, <i>Chihli</i> , and Hopei in <i>Honan</i> , comprising Chante Fu, Weihui Fu, and Huaiching Fu. Many castle walls and houses were destroyed and many people killed.

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363	1068		Yiyang in the Chansha Fu, <i>Hunan</i> . A mountain was displaced with a loud noise.
364	1068	Sept. 3.	Mochou, Hochien Fu, <i>Chihli</i> . Accompanied with loud noise.
365	1068	Dec. 29.	Imperial City, Kaifeng, <i>Honan</i> ; also at Mochou, <i>Chihli</i> .
366	1069	Jan. 6.	Yingchou, Hsuehou Fu, <i>Ssuehuan</i> .
367	1069	Jan. 20.	Chichou in Chingho, Paoting Fu, <i>Chihli</i> .
368	1069	Jan. 24.	Tsungchou in Tientsin Fu, <i>Chihli</i> . Muddy water burst out from the ground, bringing with it wood, nuts, shells, &c.
369	1069	Jan.	Chaochou Fu, <i>Kuangtung</i> . Shocks were repeated more than ten times in the day, and the ground did not come to rest for more than six months.
370	1072	Nov. 3.	Hua, Tungchou Fu, <i>Shensi</i> .
371	1085	June 14.	Imperial City, Kaifeng, <i>Honan</i> .
372	1087	April 10.	Taichou, northern part of <i>Shansi</i> . The shock was followed by a loud noise.
373	1039	Spring.	Shensi comprising part of <i>Shensi</i> and <i>Kansu</i> (see Hsian Fu); also Hopei, Huaching Fu, in <i>Honan</i> .
374	1092	Nov. 7.	Lanchou, Cheniung, Pingliang Fu, in <i>Kansu</i> ; also Yunghsing (now called Hsian Fu), <i>Shensi</i> .
375	1092	Nov. 8.	Huanchou, Chingyang Fu, <i>Kansu</i> .
376	1095	Jan. 13.	Taiyuan Fu in <i>Shansi</i> .
377	1095	Nov.	Honan Fu, <i>Honan</i> .
378	1095		Souchou Fu, <i>Kangsu</i> . Shocks were repeated many times from summer to autumn.
379	1096	April 9.	Chiennan and Tungchuan (now called Chengtu Fu, <i>Ssuehuan</i>).
380	1096	Oct. 17.	Chuchou, <i>Anhui</i> , and Yichou, <i>Shantung</i> .
381	1097	Aug. 4.	Taiyuan Fu, <i>Shansi</i> . It was followed by a loud noise
382	1098	Aug. 31.	There was an earthquake which lasted a long time.
383	1099	Feb. 27.	Enchou in Tungchang Fu, <i>Shantung</i> .
384	1099	Aug. 28.	Taiyuan Fu, <i>Shansi</i> .
385	1100	June 19.	Ditto.
386	1102	Jan. 23.	Chin, Hsi, Tai, Lan, Kelan, Paote, Ningwu, in Taiyuan Fu, <i>Shansi</i> ; Shih (now Wupao) and Weisheng, Suite Fu, <i>Shensi</i> . These places are on opposite sides of the valley, through which the Yellow River runs in a north-south direction. Shocks were repeated day and night, and many castle walls and houses were destroyed and many people were killed.
387	1122		Hsingchou in Paoting, <i>Chihli</i> .
388	1124	Feb.	Imperial City, Kaifeng, <i>Honan</i> . The ground did not come to rest for several days. Shocks were followed by a loud noise.
389	1125	Sept. 6.	In the Hsiho Circuit, in the northern part of <i>Kansu</i> . Most damage done was at Lanchou. The ground sank to a depth of 40 or 60 feet, and several hundred houses and people were buried.
390	1128	Feb. 22.	Changan, the prefectural city of Hsian Fu, <i>Shensi</i> .
391	1133	Sept. 9.	Pingchiang, Yochou Fu, <i>Hunan</i> . Most damage was done at Huchou (B, Oct. 12).
392	1134		Hsingtu, in Chenting Fu, <i>Chihli</i> .
393	1135	June.	Chengtu Fu, <i>Ssuehuan</i> .
394	1136	July 16.	Yuhang, Hangchou Fu, <i>Chehkiang</i> . Shock was followed by loud noise like thunder.
395	1137		Earthquake.
396	1137	Aug. 21.	Imperial City, Kaifeng, <i>Honan</i> .
397	1141	Jan. 23.	Ditto.
398	1144	Nov. 30.	Ditto.
399	1154	Mar. 17.	Earthquake.
400	1155	May 5.	Earthquake (B, April 28).
401	1158	Sept. 28.	Earthquake.
402	1160	April 7.	Hotung (Puchou and Pingyang), <i>Shansi</i> , and Tungchou Fu, <i>Shensi</i> .
403	1161	April 23.	Ditto.
404	1162	Sept. 1.	Ditto (B, Aug. 25).

No.	DATE.		
	A.D.		
405	1163	July 24.	Earthquake.
406	1163	Nov. 24.	Ditto.
407	1164	March.	Imperial City, Kaifeng, <i>Honan</i> .
408	1165	Aug. 14.	Imperial City, Kaifeng, <i>Honan</i> . Accompanied by a loud noise.
409	1165	Aug. 16.	Imperial City, Kaifeng, <i>Honan</i> .
410	1166	Oct. 9.	Ditto.
411	1167	Nov. 6.	Earthquake.
412	1169	Jan. 31.	Shihchou, Suiting Fu, <i>Ssuehuan</i> . The movement continued for three days, and was accompanied by sounds. The tiles fell from many roofs.
413	1175	Jan. 16.	Imperial City, Kaifeng, <i>Honan</i> .
414	1180	June 16.	Ditto.
415	1183	Jan. 8.	Earthquake, Kaifeng, <i>Honan</i> .
416	1184	Jan. 27.	Ditto.
417	1185	June 14.	Ditto.
418	1187	June 15.	Ditto.
419	1195	April 10.	Earthquake, Kaifeng, <i>Honan</i> , accompanied by a thunder-storm. The Palace gate was damaged.
420	1195	Sept.	Imperial City, Kaifeng, <i>Honan</i> .
421	1200	July 15.	Ditto.
422	1200	Oct.	Earthquake in North-East China (Shangtu?).
423	1200	Dec. 19.	Ditto.
424	1200	Dec. 26.	Ditto.
425	1209	Dec. 11.	Pingyang Fu, <i>Shansi</i> . The motion was from north-west, and was followed by a loud noise.
426	1209	Dec. 23.	In the same district. The greatest damage was at Fushan in Pingyang Fu. Many castles and houses were destroyed and many people were killed.
427	1210	Mar. 31.	Heavy shock in the same district. Movement did not cease until the end of September. The shocks were accompanied with noise.
428	1213	May.	Hsingtu.
429	1213	July 3.	Yenchou Fu, <i>Chelkiang</i> (B, June 26).
430	1216	Mar. 25.	East Hsichuan, Hsining Fu, <i>Kansu</i> . The ground did not come to rest for four days.
431	1217	Mar. 28.	Imperial City, Kaifeng Fu, <i>Honan</i> .
432	1219	June 9.	Pingliang and Cherjung in Pingliang Fu, <i>Kansu</i> . It was accompanied by a loud noise and followed by a dust storm, which made the whole day dark. The damage was so great that it was impossible to find out how many houses had been destroyed and how many people had been killed.
433	1219	June.	Imperial City, Kaifeng, <i>Honan</i> .
434	1219	July.	Hsichuan, Hsining, <i>Kansu</i> .
435	1220	July 30.	Earthquake.
436	1221	Feb. 10.	Earthquake and thunderstorm.
437	1221	June 11.	Hsichuan, Hsining Fu, <i>Kansu</i> .
438	1223	Oct. 1.	Earthquake.
439	1241	Jan. 16.	Ditto.
440	1242	Feb. 25.	Ditto.
441	1255		Shu (the literary name of <i>Ssuehuan</i>), Chengtu Fu.
442	1270		Chiating Fu (now Sungpan), Lungan Fu, <i>Ssuehuan</i> .
443	1274	Oct. 23.	Imperial City, Tatu (now Peking).
444	1281	Oct. 19.	Peking.
445	1289	Feb. 4.	Earthquake, Peking.
446	1290	Mar. 28.	Chuanchou Fu, <i>Fukien</i> .
447	1290	Mar. 31.	Earthquake, Chuanchou Fu, <i>Fukien</i> .
448	1290	Sept. 27.	Shangtu (also called Luanking), <i>Chihli</i> , and Wuping, Tingchou Fu, <i>Fukien</i> . At Wuping 100,000 people were killed.
449	1291	Sept.	Pingyang Fu, <i>Shansi</i> . Eighteen thousand houses were destroyed.
450	1295	April 11.	Earthquake.

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451	1302	Dec. 29.	Yunnan Fu, <i>Yunnan</i> . The ground did not come to rest for several days.
452	1302	Dec.	Ditto.
453	1303	Sept.	Pingyang Fu, Taiyuan Fu, <i>Shansi</i> . The land opened, and water and sand came out of the fissures; 100,000 houses were destroyed and many people were killed. A landslide, more than ten Chinese miles in length, took place. This was at Chaoching in Pingyang Fu. At Hsukou, Chi, and Pingchou, in Taiyuan Fu, the ground opened and water burst out to form a stream. At Pingchou the north castle wall was destroyed for the length of one Chinese mile; on the east side it was destroyed for a length of 200 feet. At Pingyang Fu the ground did not come to rest until February 1304. (: Chinese = 1 English mile.)
454	1304	Feb.	Pingyang Fu, <i>Shansi</i> . Many houses were destroyed.
455	1305	May.	Tatung Fu, <i>Shansi</i> . It was accompanied with a noise like thunder, and 5,800 houses were destroyed and 1,400 people were killed. At Huaijen in Tatung Fu water burst out at two places to form lakes, and was black in colour: one of these lakes had an area of 18 pu (240 pu = 1 acre) and a depth of 115 feet; the other was 66 pu and 10 feet in depth.
456	1305	June 18.	Pingyang Fu and Taiyuan Fu, <i>Shansi</i> . In order to stop the continually occurring earthquakes the Government ordered the names Pingyang and Taiyuan to be changed to Chinning and Chining.
457	1305	Dec. 2.	Tatung Fu, <i>Shansi</i> .
458	1305	Dec.	Earthquake.
459	1306	Jan.	The shocks still continued at Chinning and Chining. They apparently commenced in 1303.
460	1306	May 12.	Kaicheng, Yen-an Fu, <i>Shensi</i> .
461	1307	Sept. 15.	Kaicheng, Yen-an Fu, <i>Shensi</i> .
462	1308	July 6.	Ningyuan district in the Lungsi of Kungchang, <i>Kansu</i> . Also there was a great earthquake in Wumeng in Chactung Fu, <i>Yunnan</i> . There were six heavy shocks in three days.
463	1308	Sept.	Puchou, <i>Shansi</i> .
464	1308	Oct. 30.	Puchou, <i>Shansi</i> , and Ling, in Ninghsia Fu, <i>Kansu</i> .
465	1310	Jan. 22.	Yangchu in Taiyuan Fu, <i>Shansi</i> . The shock was followed by a great noise.
466	1311	Jan. 3.	Chining (Pingyang), <i>Shansi</i> .
467	1311	April 24.	Ninghsia, <i>Kansu</i> .
468	1311	Aug. 6.	Kanchou Fu in Kanliang, <i>Kansu</i> . There was a noise like thunder and a hurricane.
469	1311	Sept. 16.	Ninghsia, <i>Kansu</i> .
470	1313	July.	Imperial City, Peking, <i>Chihli</i> (B. June 24).
471	1313	July 3.	Imperial City, Peking, <i>Chihli</i> .
472	1313	July.	Ditto.
473	1313	July 22.	Ditto.
474	1314	Mar. 8.	Taning, Hsi, <i>Shansi</i> .
475	1314	May 23.	Taning, Hsi, <i>Shansi</i> . Followed by noise.
476	1314	Sept. 14.	Piengliang (now Kaifeng), Chih (now Wuchih), in Huaiching Fu, Wuan, in Chante Fu, <i>Honan</i> (B. Oct. 5).
477	1315	Jan. 2.	Taning in Hsi, <i>Shansi</i> , accompanied by a noise like thunder.
478	1316	Aug.	Chining and Chinning, <i>Shansi</i> . Accompanied by a noise like thunder (B. Oct. 7).
479	1316	Nov. 6.	Honan Fu, <i>Honan</i> .
480	1317	Feb. 13.	Chining, <i>Shansi</i> . Accompanied by a noise.
481	1317	Sept. 11.	Ditto.
482	1317	Oct. 9.	Lingpei (outside the great wall to the north of <i>Kansu</i>). Shocks were repeated for three days.
483	1318	Feb. 21.	Earthquake, Yichou, Liaotung, <i>Shingking</i> .
484	1318	Mar. 12.	Honing in Lingpei, <i>Kansu</i> .
485	1318	April 27.	Teching in Chaoching Fu, <i>Kuangtung</i> (B. June 18).

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486	1322	Nov. 17.	Earthquake, Peking.
487	1322	Dec. 25.	Ditto.
488	1324	Jan. 1.	Fengyuan (now Changan) in Hsian Fu, <i>Shensi</i> . Accompanied by a noise.
489	1326	Jan. 19.	Ninghsia, <i>Kansu</i> . Accompanied by sound. Shocks repeated three times.
490	1327	April 5.	Honing in Lingpei, <i>Kansu</i> . Accompanied by loud noise.
491	1327	Aug.	Tungwei in Kungchang Fu, <i>Kansu</i> . A mountain was displaced. At Tiao-men the shock made a great noise. On the same day there was also a shock at Fenghsiang Fu and Hsingyuan, Hanchung Fu, <i>Shensi</i> ; Chentu, <i>Ssuehuan</i> ; Shenchou and Chiangling in Chingchou, <i>Hupeh</i> .
492	1327	Sept. 30.	Ninghsia, <i>Kansu</i> .
493	1328	Aug. 14.	Earthquake, <i>Kansu</i> .
494	1328	Sept. 1.	Taning, Hsi, <i>Shansi</i> .
495	1328	Nov. 21.	Taning, Hsi, <i>Shansi</i> (B, 14th)
496	1331	May.	In the Chih district (now Wuchih) in Huaiching Fu, <i>Honan</i> , and Chenting Fu, <i>Chihli</i> . The ground shook continuously for more than a month.
497	1332	May 4.	Liaotung, or Liaoyang, <i>Shingking</i> .
498	1332	June.	Peking.
499	1332	Sept. 2.	Lunghsi, Kungchang, <i>Kansu</i> .
500	1332	Oct.	Earthquake.
501	1333	May.	Taning, Hsi, <i>Shansi</i> .
502	1333	June.	Imperial City, Peking. Accompanied by sound.
503	1333	Sept.	Lunghsi in Kungchang, <i>Kansu</i> .
504	1333	Dec. 28.	Hsunshan district in Anching Fu, <i>Anhui</i> .
505	1333	Dec.	Leping and Tehsing districts, in Jaochou Fu, <i>Kiangsi</i> .
506	1334	May.	Hsingchou, now forming Chi, Shuntien Fu, <i>Chihli</i> .
507	1334	Sept. 22.	Imperial City, Peking. A cock crowed before the earthquake commenced. A mountain disappeared, and where it stood a lake was formed, the area of which was a hundred square miles. Many people were killed.
508	1335	Dec. 17.	Hsingkuo, Wuchang Fu, <i>Hupeh</i> .
509	1336	Jan. 21.	Anching, <i>Anhui</i> . The most damage was done in Susung, Taihu, Hsunshan districts. At the same time there was an earthquake at Luchou in <i>Anhui</i> , Chichou, Huangchou Fu, <i>Hupeh</i> .
510	1336		Jaochou, <i>Kiangsi</i> .
511	1336	Mar. 9.	Susung, Anching, <i>Anhui</i> .
512	1337	Sept. 17.	Imperial City, Peking. Many houses were destroyed, and many people and cattle were killed at Shunchou, near Shunyi, Lungching, Huailai, Hsuante (now Hsuanhua), <i>Chihli</i> .
513	1337	Sept. 18.	Imperial City, Peking.
514	1338		Paoan, Hsuanhua Fu, <i>Chihli</i> , and Hsinchang in Juichou Fu, <i>Kiangsi</i> .
515	1338	July.	Hsinchou, Shuntien Fu, <i>Chihli</i> . Mount Ling was displaced.
516	1338	Aug. 10.	Paoanchou, Hsuanhua Fu, <i>Chihli</i> .
517	1338	Aug.	A mountain was displaced at Kungchang, <i>Kansu</i> .
518	1338	Sept. 6.	Imperial City, Peking. Shocks occurred two or three times during the day.
519	1341	March.	Pingliang (now Kaifeng), <i>Honan</i> .
520	1342	June 7.	Pingchin in Chining (now Taiyuan), <i>Shansi</i> . Accompanied by a loud noise like thunder. Land opened and many houses were thrown out of the vertical.
521	1343	Jan. 17.	Imperial City, Peking.
522	1343	March.	Chunchou (now Yu), Hsincheng and Mi in Kaifeng Fu, <i>Honan</i> .
523	1343	Dec.	Chiaochou, Kaomi, Laichou Fu, <i>Shantung</i> .
524	1344	Aug. 9.	Wenchou Fu, <i>Chehkiang</i> .
525	1344	Sept.	Chu and Mingyin in Yichou Fu, <i>Shantung</i> .

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526	1345	Jan.	Tungping, Tunga in Taian Fu, Yangku in Yenohou Fu, Pingyin, Chinan Fu, <i>Shantung</i> , and Hanyang, <i>Hupeh</i> .
527	1345	June.	At four districts in Chiehchou, Shuntien Fu, <i>Chihli</i> , and Tung-ping, Taian Fu, in <i>Shantung</i> .
528	1346	Jan.	Chenchiang Fu, <i>Kiangsu</i> , and Chinan Fu, <i>Shantung</i> .
529	1346	March.	Yitu, Changle, Shoukuang in Chingchou Fu, Peihai in Weichou, and Chiaochou in Laichou Fu, <i>Shantung</i> .
530	1346	April.	Kaoyuan in Chingchou Fu, <i>Shantung</i> . Many houses were destroyed.
531	1346	Sept.	Shaowu Fu, <i>Fukien</i> . Next day drum-like sounds were heard in the ground, and also in the following night.
532	1347	March.	Yitu, Lintzu, Lanclu in Chingchou Fu, Changyi of Weichou, Kaomi of Chiaochou in Laichou Fu, and Tichou of Chinan Fu, <i>Shantung</i> .
533	1347	April.	Tungping, Tunga in Taian Fu, Yanki in Yenohou Fu, Pingyin in Chinan Fu, <i>Shantung</i> .
534	1317	June	Lintzu, Chingchou Fu, <i>Shantung</i> . The ground did not come to rest for several days; at Hotung (Puchou, Pingwang), <i>Shansi</i> , the ground was fissured and water burst forth; many houses were destroyed and many people killed.
535	1347	July 12.	Tanyang, Chenchiang Fu, <i>Kiangsu</i> .
536	1349	July	Taichou Fu, <i>Chehkiang</i> .
537	1350	Nov.	Hsukao in Taiyuan Fu, <i>Shansi</i> .
538	1351	May 22.	Fen, Hsin, Wenshui, Pingchih, Yutzu, and Shouyang, in Taiyuan Fu, Yushe of Liao in Chinning (now Pingyang Fu, <i>Shansi</i>), and Honci, Hsiuwu, Menchou, in Huaiching Fu, <i>Honan</i> . The shock was followed by a noise like thunder; many houses were destroyed and many people killed and wounded.
539	1351	Sept.	Kungan, Sungtsu, Chehchiang, Chingchou Fu, Hsia (now Yichang Fu), and Chingmen, Chengtien Fu (now Anlu Fu), <i>Hupeh</i> .
540	1352		Lingshih in Ho (Pingyang Fu), <i>Shansi</i> .
541	1352	April	Shensi (the provinces comprise part of <i>Kansu</i> , the north-west part of <i>Szechuan</i> , and the present <i>Shensi</i>). Most damage was done at Chuanglang Tinghsi in Liangchou Fu, Chingning in Pingliang Fu, and Huichou (now Huan) in Chingyang, <i>Kansu</i> . Many houses were destroyed; a mountain was moved and a valley filled up.
542	1353		Chuanglang, Liangchou Fu, Tingsi, Kungchang Fu, Chingning, Pingliang Fu, and Huichou, Lanchou Fu, <i>Kansu</i> .
543	1354	May	Chiehhsiu, Fenhou Fu, <i>Shansi</i> . Water burst out.
544	1354	Aug.	Hsiaoyi, Fenhou Fu, <i>Shansi</i> .
545	1354	Dec.	Ningkuo, Chingte in Ningkuo Fu, <i>Anhui</i> .
546	1354	Dec.	Haichou in Huaian Fu, <i>Kiangsu</i> .
547	1355	Jan.	Shaohsing Fu, <i>Chehkiang</i> .
548	1355	Aug. 9.	Paote in Chining (now Taiyuan Fu), <i>Shansi</i> .
549	1356	Spring.	Chiehchou (Shuntien Fu) and four other districts in <i>Chihli</i> . The ground did not come to rest for ten days.
555	1356	July	Leichou Fu, <i>Kwantung</i> .
550	1358	Mar. 25.	Linchou in Chinning (Taiyuan Fu), <i>Shansi</i> .
521	1358	June	Yitu in Chingchou, <i>Shantung</i> .
553	1359	Feb.	Chingyuan in Chuchou Fu, <i>Chehkiang</i> .
554	1360	April	Shunchang in Yenping Fu in <i>Fukien</i> .
555	1362	April	Nanhsung, <i>Kwantung</i> .
556	1363	Feb. 3.	Taichou Fu, <i>Chehkiang</i> .
557	1365	Oct.	Hsinghua Fu, <i>Fukien</i> . With a noise like thunder.
558	1366	April.	Haichou in Huaian Fu, <i>Kiangsu</i> . With a noise like thunder.
559	1366	July.	Chiehhsiu in Fenhou Fu, <i>Shansi</i> .
560	1366	Aug.	Hsin, Lin, Shih in Hsukao of Taiyuan and Hsiaoyi, Pingyao in Fenhou, <i>Shansi</i> . Many people were killed.
561	1366		Kung, Honan Fu, <i>Honan</i> . A mountain was displaced.

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562	1367	June.		Chinan, <i>Shantung</i> .
563	1367	Nov. 13.		Fuhchou, <i>Fuhkien</i> .
564	1368	Jan. 26.		Fuhchou, <i>Fuhkien</i> . With a noise like thunder.
565	1368	June.		Wenshui, Hsukao in Taiyuan Fu, Hsiaoyi, Chiehhsiu in Fenchou Fu, Paoe of Linchou, Shihlou of Shi, <i>Shansi</i> and Shensi (comprising <i>Shensi</i> and <i>Kansu</i>) (see Hsian Fu, <i>Shensi</i>).
566	1368	Dec. 2.		Shensi, now represented by <i>Shensi</i> and <i>Kansu</i> (see Hsian).
567	1371			Kungchang, Lintao, and Chingyang, <i>Kansu</i> .
568	1372	June 1.		Tsangwu in Wuchou Fu, Hochou, Kungcheng and Lishan (now Yungan in Pingle Fu), <i>Kuangsi</i> .
569	1372	Aug. 6, 13.		Yangchu, Taiyuan Fu, <i>Shansi</i> .
570	1372	Aug. 24.		The Imperial City, Nanking, <i>Kiangsu</i> . Sixteen people were killed.
571	1372	Sept. 14.		Hsukao, Taiyuan Fu, <i>Shansi</i> . The ground did not come to rest for three days, and loud noises came from the north-west.
572	1372	Sept. 29.		Yungchu, Taiyuan Fu, <i>Shansi</i> .
573	1372	Oct. 23.		Ditto.
574	1372	Nov. 8.		Ditto.
575	1372	Nov. 21.		Ditto.
576	1372			Yangchu, Taiyuan Fu, <i>Shansi</i> . The shocks were repeated seven times during the year; the ground did not come to rest for eight years.
577	1375	May.		Imperial City, Nanking (now Chiangning), <i>Kiangsu</i> .
578	1376	Jan. 2.		Ditto.
579	1378	May 8.		Ningsia in north <i>Kansu</i> . It destroyed many castle walls.
580	1382	Jan. 22.		Fuhchou Fu, <i>Fuhkien</i> , Kuangchou Fu or Canton, <i>Kuangtung</i> , and Hochou, Lanhou Fu, <i>Kansu</i> .
581	1386	July 21.		Yunnan Fu, <i>Yunnan</i> .
582	1390	Dec. 27.		Ditto.
583	1394	Feb. 9.		Chinan, <i>Shantung</i> .
584	1399	May 7.		Imperial City, Nanking, <i>Kiangsu</i> .
585	1403	Dec. 18.		Peking, Taiyuan Fu, <i>Shansi</i> , Ningsia, in <i>Kansu</i> .
586	1404	Dec. 26.		Imperial City, Nanking, Chinan Fu, <i>Shantung</i> , and Kaifeng Fu, <i>Honan</i> .
587	1408	June 17.		Imperial City, Nanking.
588	1413	Sept. 22.		Ditto.
589	1415	Nov. 8.		Peking.
590	1419	Oct. 14.		Ditto.
591	1420	Aug. 9.		Ditto.
592	1424	Aug. 3.		Nanking.
593	1425	Mar. 16.		Lian, Luchou Fu, <i>Anhui</i> , and Nanking, where the ground did not come to rest for seven days; there were about forty-two shocks.
594	1426	Aug. 14.		Imperial City, Peking. The motion was from south-east to north-west, and there was a loud noise.
595	1427			Nanking. Shocks occurred ten times in a day.
596	1428			Nanking.
597	1429			Peking and Nanking.
598	1430	Feb. 12.		Nanking.
599	1430	Feb. 21.		Ditto.
600	1438	April 18.		Imperial City, Peking.
601	1438	April 19.		Ditto.
602	1438	April 23.		Ditto.
603	1439	Aug. 7.		Ditto.
604	1439	Sept. 12.		Ditto.
605	1440	Nov. 4.		Chuansiang in Liangchou Fu, <i>Kansu</i> . The ground did not come to rest from October to the end of November; there were about twenty shocks; castle walls and houses were destroyed and many people were killed.
606	1445	Mar. 30.		Imperial City, Peking.
607	1451	Aug. 22.		Ditto.

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608	1452		Nanking.
609	1454	Nov. 21.	Imperial City, Peking. Accompanied by a loud noise; motion north-west to south-east.
610	1457	Nov. 11.	Nanking.
611	1465	Feb.	Hsiangyang Fu, <i>Hupeh</i> .
612	1465	May 12.	Tiaochou, Tientsin Fu, <i>Chihli</i> . The ground did not come to rest for twenty-two days.
613	1465	May 12.	A strong earthquake also occurred in Chengtu Fu, <i>Szechuan</i> , and shocks were repeated 375 times.
614	1467		Earthquake.
615	1467	June 28.	Hsuanhua Fu, <i>Chihli</i> , and Tatung Fu, <i>Shansi</i> . There was also a strong earthquake at Sochou in Soping Fu and Weiyuen, <i>Shansi</i> ; many people were wounded.
616	1468	Sept. 1.	Imperial City, Peking. Accompanied with sound.
617	1469	Jan. 3.	In Hukuang. This province comprises Changsha Fu, <i>Hunan</i> , and Wuchang Fu, <i>Hupeh</i> .
618	1470	Jan. 18.	Juning Fu, <i>Honan</i> , Wuchung Fu, Hanyang Fu, <i>Hupeh</i> , and Yochou Fu in <i>Hunan</i> .
619	1470	Feb. 18.	<i>Honan</i> and Hukuang comprising <i>Hunan</i> and <i>Hupeh</i> (Wuchang).
620	1470		Hukuang, Wuchang, <i>Hupeh</i> .
621	1474	May 23.	Hoching in Lichiang Fu, <i>Yunnan</i> . Shocks were repeated fifteen times; many houses were destroyed and many people killed.
622	1474	Dec. 3.	Tashaching in Lingchou, Chingyang Fu, <i>Kansu</i> . It made a noise like thunder: shocks were repeated day and night, and many houses were destroyed.
623	1476	Feb. 10.	Nanking, <i>Kiangsu</i> .
624	1476	Nov. 6.	Imperial City, Peking.
625	1477	Feb. 22.	Fenyang and Linhuai, <i>Anhui</i> . Accompanied by sound.
626	1477	Mar. 28.	Lintao and Kungchang in <i>Kansu</i> . It destroyed many castle walls.
627	1477	May 22.	Kanchou, Ninghsia, Liangchou, <i>Kansu</i> , Yulin, <i>Shensi</i> , and Yichou in <i>Shantung</i> . The greatest damage was done at Ninghsia and Kanchou, where the ground was cracked and the castle walls were damaged in eighty places.
628	1477	Oct. 25.	Imperial City, Peking. Shocks were repeated three times during the day.
629	1478	July	Taiping Fu, <i>Kuangsi</i> . Shocks were repeated seven times during the day, and the ground was moving until the end of August.
630	1478	Aug.	Chengtu, <i>Szechuan</i> . Many houses destroyed and many people were killed.
631	1480	June	Changle, Fuchou Fu, <i>Fukien</i> .
632	1480	Sept. 23.	Yuehsui in Ningyuan Fu, <i>Szechuan</i> . Shocks were repeated seven times during the day, and it was several days before the ground came to rest.
633	1481	Mar. 19.	Nanking, Huaian Fu, Yangchou Fu, <i>Kiangsu</i> , Fengyang Fu, Luchou Fu, Hochiu, Yingchou Fu, <i>Anhui</i> , Yen-chou Fu, <i>Shantung</i> , and Honan Fu in <i>Honan</i> .
634	1481	June 30.	Tsunhua and Suchou, Shuntian Fu, <i>Chihli</i> .
635	1481	July 6.	Another earthquake at the same places, and Yungping Fu, <i>Chihli</i> , Liaotung, and <i>Shinking</i> . Shocks repeated three times during the day.
636	1484	Feb. 7.	Imperial City, Peking, Yungping, Hsuenhua, <i>Chihli</i> , and Liaotung. Most damage was done at Hsuenhua; many castles destroyed and many people killed.
637	1484	June 4.	Taichou, <i>Shansi</i> . Shocks were repeated seven times.
638	1485	Mar. 15.	Taian Fu, <i>Shantung</i> .
639	1485	Mar. 26.	Ditto. Four days later the shock was repeated.
640	1485	April 5.	Earthquake.
641	1485	April 8.	Ditto.
642	1485	April 13.	Ditto.

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643	1185	May 25.	Kuyuan in Pingliang Fu; Lanho, Tao, and Min, in Kungechang Fu, <i>Kansu</i> . The shock was followed by a loud noise.
644	1485	June 4.	Chichou, Shuntien Fu, Tsunhua, in <i>Chihli</i> . The shock was followed by a loud noise, and the ground did not come to rest for several days. Many castle walls and houses were destroyed.
645	1485	July 4.	Imperial City, Peking.
646	1485	Oct. 25.	Lienchou, <i>Kuangtung</i> ; and Wuchou, <i>Kuangsi</i> . Shocks were repeated many times, and the ground did not come to rest for sixteen days.
647	1485	Dec. 3.	Imperial City, Peking.
648	1486	July 29.	Ningchiang, in Hanchung Fu, and Paochi, in Fengsiang Fu, <i>Shensi</i> . At Ningchiang the ground was cracked for a length of 60 to 100 feet. At Paochi there was a crack three Chinese miles in length and 10 feet wide.
649	1486	Oct. 15.	Chengtu Fu, <i>Ssuehuan</i> . Shocks were repeated seven or eight times during the day and continued until the day following: they made a noise like thunder.
650	1488	Sept. 25.	Han, Mou, Chengtu Fu, <i>Ssuehuan</i> . Thirty-seven houses were damaged and many people were killed.
651	1488	Oct. 1.	A landslip took place at Hsuanhua Fu, <i>Chihli</i> : it was 150 yards long, 10 feet wide, and 3 feet in depth. A narrow footpath was elevated in the middle of the river <i>Sia</i> . It was one foot above the surface of the water and 70 yards in length.
652	148	Jan. 12.	Chengtu Fu in <i>Ssuehuan</i> . Shocks were repeated many times for three days.
653	1489	June 10.	Chengtu Fu, <i>Ssuehuan</i> . Shocks were repeated for three days and noises were heard.
654	1491	Jan. 30.	Imperial City, Peking.
655	1491	July 21.	Ditto.
656	1491	Sept. 23.	Nanking, Huaian, and Yangchou Fu, <i>Kiangsu</i> .
657	1493	March.	Ninghsia, <i>Kansu</i> . Shocks were repeated twenty times in three years.
658	1493	May 4.	Kaifeng Fu, Weihui, <i>Honan</i> , Tungchang Fu, <i>Shantung</i> .
659	1494	April 3.	Chuching Fu, <i>Yunnan</i> . Many houses destroyed and many people killed. Also at Peking and Nanking. The shocks were repeated six times during the year.
660	1495	April 20.	Ninghsia, <i>Kansu</i> . Shocks occurred twelve times, and were followed by loud noise. Walls and houses were damaged, and many people were wounded.
661	1495	Oct. 11-18.	Annan, Hsingyi Fu, <i>Kueichou</i> . There were twelve shocks.
662	1495	Nov. 8.	Haichou, <i>Kiangsu</i> .
663	1495	Nov. 10.	Ditto.
664	1495		Nanking.
665	1496		Peking and Nanking.
666	1497	Feb. 27.	Imperial City, Peking, and Taiyuan Fu, <i>Shansi</i> .
667	1497	July 13.	Hai Feng in Wuting Fu, <i>Shantung</i> . Shocks were followed by a loud noise and continued for several days.
668	1497		Chenting Fu (now forming Chengting) in Chinho, <i>Chihli</i> ; Taiyuan Fu, Tunlin, in Luan Fu, <i>Shansi</i> ; Yulin Fu, <i>Shensi</i> ; Chenfan in Liangchou Fu, Lingchou, Ninghsia Fu, <i>Kansu</i> . The greatest damage was at Tunlin, where tiles fell from the roofs.
669	1500	Aug. 21.	Imperial City, Peking.
670	1500	Nov. 28.	Peking, Nanking, and Fengyang, <i>Anhui</i> .
671	1501	Jan. 29.	Yenan, Tung, Hua, Hsingyang, Chaoyi, Changan, in Hsian Fu, Tungkuang, in Tungchou Fu, Hsientung, Pinghsiang Fu, <i>Shensi</i> ; Chingyang, <i>Kansu</i> . The greatest damage was done at Chaoyi and Hsientung, where castle walls and houses were destroyed and people were killed. Fissures were formed, from which water flowed to form a small

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		river. Movement continued for several months. Each shock was followed by a loud noise. A strong earthquake also occurred at Yungning, Lushi, in Shan Fu, <i>Honan</i> ; Pingyang and Anyi, Jungho, in Puchou Fu, and Puchou, <i>Shansi</i> .
672	1501 Feb. 26.	Puchou Fu, Hsinghua Fu, Chuanchou Fu, and Changchou Fu, <i>Fukien</i> .
673	1501 Mar. 14.	Puchou, <i>Shansi</i> . Shocks were repeated twenty-nine times and the ground did not come to rest until the middle of next month.
674	1501 Oct. 20.	In the province of <i>Kweichou</i> . Shocks were repeated three times.
675	1501 Dec. 6.	Nanking.
676	1502 Oct. 27.	Nanking, Hsuehou Fu, <i>Kiangsu</i> ; Taming Fu, Shunte Fu, <i>Chihli</i> ; Chinan, Tunchang, Yen-chou, and Puchou in Tsaochou Fu, <i>Shantung</i> . The greatest damage was at Puchou, where the ground was cracked and water burst forth. More than one hundred people were killed.
677	1502 Oct. 27.	Kaifeng Fu, Changte Fu, <i>Honan</i> ; Pingyang Fu, Tsechou Fu, and Luan Fu, <i>Shansi</i> .
678	1502 Dec. 4.	So, Tai, Ying, Shanyin, Yangchu, and Mayi, Tatung Fu, <i>Shansi</i> . The earthquake made a loud noise.
679	1502 Dec. 7.	Nanking.
680	1503 Mar. 31.	Ditto.
681	1505 July 21.	Ningshia, <i>Kansu</i> . The shock was followed by a loud noise; many castles and houses were thrown out of the vertical.
682	1505 Oct. 19.	Hangchou Fu, Chihsing Fu, Shaohsing Fu, and Ningpo Fu, <i>Chehkiang</i> . The shock was followed by a loud noise.
683	1505 Oct. 20.	Nanking, Suchou Fu, Sunchiang Fu, Changechou Fu, Chenchiang Fu, Huaiai Fu, Yangchou Fu, and Tung, <i>Kiangsu</i> ; Ningkuo Fu and Hochou, Taiping Fu, <i>Anhui</i> .
684	1505 Oct. 27.	Puchou, Chieh, Chiang, <i>Shansi</i> ; Hsuanhua Fu, <i>Chihli</i> . Greatest damage occurred at Anyi in Chieh and Wanchuan in Hsuanhua Fu, <i>Chihli</i> ; many houses destroyed and many people killed.
685	1506 Mar. 27 t; 29	Hoyang in Tungchou Fu, <i>Shensi</i> . Shocks were repeated more than ten times, and each was followed by a loud noise like thunder.
686	1506 May 6.	Yunnan Fu, <i>Yunnan</i> . The ground did not come to rest for three or four days; many houses were destroyed and many people were killed.
687	1506 Sept. 7.	Aoshanwei, Laichou Fu, <i>Shantung</i> . Many castle walls were damaged; there were many shocks, and each was followed by a loud noise; the ground did not come to rest until December. Altogether there were about forty-five shocks.
688	1507 Nov. 14.	Anchou, Hsinhsingchou, Yunnan Fu, <i>Yunnan</i> . Many people were killed. The ground did not come to rest for three days.
689	1509 June 5.	Wuchang Fu, <i>Hupch</i> . The shock was followed by a loud noise and lightning.
690	1509 June 5.	Chuhsiung Fu, <i>Yunnan</i> . The ground did not come to rest for three days; there were about five shocks.
691	1510 May.	Chuhsiung Fu, <i>Yunnan</i> . Movement continued for thirteen days.
692	1511 Nov. 27.	Tengchuan, Tali Fu, Chienchuan, and Hoching, Lichiang Fu, <i>Yunnan</i> . The greatest damage was done at Chienchuan and Hoching, where many people were killed and many houses destroyed.
693	1511 Dec. 12.	Imperial City, Peking, Paoting Fu, Hochien Fu, and eight districts and three towns in <i>Chihli</i> , and Wating Fu in <i>Shantung</i> . In three days there were nineteen shocks.
694	1512 June 3.	Chuhsiung Fu, <i>Yunnan</i> . There were many shocks, each of which was followed by a noise like thunder.

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695	1512	Oct. 17.	Tengchung (now Tengyuen) in Yungchang Fu, <i>Yunnan</i> . Movement continued for three days; red water came out from the ground; many castle walls and houses were destroyed and many people were killed.
696	1514	Jan. 9.	Chengtu Fu, Chungching Fu, Tuogchuan Fu, <i>Ssuehuan</i> .
697	1514	July 15.	Fengyang Fu, <i>Anhui</i> . Followed by a loud noise.
698	1514	Sept. 13.	Peking.
699	1514	Oct. 3.	Hsuehou Fu, <i>Ssuehuan</i> , Taiyuan Fu, and Tatung Fu, <i>Shansi</i> . Shock followed by a loud noise.
700	1515	June 27.	Yunnan Fu, Chaochou in Tali Fu and Yungning (now Nanning), Chuching Fu, <i>Yunnan</i> . For more than a month twenty or thirty shocks occurred each day; the ground was cracked and water burst out; the damage was so great that it was impossible to find out how many houses had been destroyed or how many people had been killed.
701	1515	Oct. 10.	Tali Fu, <i>Yunnan</i> .
702	1515	Oct. 29.	Ditto.
703	1516	Sept. 25.	Nanking (forming the present <i>Anhui</i> and <i>Kiangsu</i>) and Wuchang Fu in <i>Hupei</i> .
704	1517	Jan. 15.	Chuhsiung Fu, Tali Fu, Menghua, and Chingtung, <i>Yunnan</i> .
705	1517	May 19.	Yukan, Fengcheng in Fuchou Fu, and Chuanhsi Fu, <i>Kiansi</i> ; Chinhsiang, Chinning Fu, <i>Shantung</i> ; Hangchou Fu, <i>Chehkiang</i> . The ground did not come to rest until the end of August, and there were about fifteen shocks.
706	1517	July 22.	Hsi, Hsio, Tungshai, in Linan Fu and Hsinhsing, <i>Ohengchiang</i> Fu, <i>Yunnan</i> . Many houses and castles were destroyed, and many people were killed.
707	1517	Oct. 21.	Chinan, Chingchou, Laichou, and Tengchou Fu, <i>Shantung</i> .
708	1517		At Chuanchou Fu, <i>Fukien</i> . The ground did not come to rest from February to June; at Chinhua, <i>Chehkiang</i> , the movement lasted from February to July.
709	1518	July 18.	} Chao, Tengchou, Langchiung, in Tali Fu, and Menghua, <i>Yunnan</i> .
710	1518	Dec. 10.	
711	1518	Dec. 19.	
712	1519	Mar. 23.	Imperial City, Peking.
713	1519	Oct. 18.	Hsuanhua Fu, Changping, in Shuntien Fu, and Kaiping, <i>Chihli</i> .
714	1519	Oct. 28.	Fuchou Fu, Hsingchou Fu, Chuanchou Fu, <i>Fukien</i> .
715	1520	April 5.	Anning, Yunnan Fu, Hoehing, Lichiang Fu, Yao in Chuhsiung Fu, Pinchuan in Tali Fu, and Menghua, <i>Yunnan</i> . The greatest damage occurred at Menghua. Many castles and houses were destroyed and many people were killed.
716	1520	Aug. 28.	Chingtung Fu, <i>Yunnan</i> . The whole district was damaged and the shocks were followed by a loud noise.
717	1520	Sept. 1.	Chinan, Tungchang, <i>Shantung</i> , and Kaifeng, <i>Honan</i> .
718	1523	Jan.	Nanking (comprising the present <i>Anhui</i> and <i>Kiangsu</i>), <i>Shantung</i> ; <i>Honan</i> , and Hsian Fu, <i>Shensi</i> .
719	1523	Aug. 24.	Tinghai and many neighbouring districts in <i>Chehkiang</i> . Many buildings were destroyed.
720	1524	Feb. 12.	Peking, Nanking; <i>Honan</i> Fu, <i>Honan</i> ; Chinan, <i>Shantung</i> ; Taiyuan, <i>Shansi</i> ; and Hsian, <i>Shensi</i> .
721	1524	Feb. 27.	Suchou Fu, Changchou Fu, <i>Kiangsu</i> , and Nanking.
722	1525	Sept. 13.	Hsuehou Fu, <i>Kiangsu</i> ; Fengyang, <i>Anhui</i> ; Huaiching and Kaifeng, <i>Honan</i> . The shock was followed by a loud noise.
723	1525	Oct. 12.	Ditto.
724	1526	May 31.	Yungchang Fu, Tengchang Fu (now Tengyueh), <i>Yunnan</i> , and Annan, <i>Kucichou</i> . Accompanied by sound.
725	1526	June 9.	Ditto.
726	1527	Nov. 27.	Imperial City, Peking.
727	1533	Sept. 25.	Ditto.
728	1536	Nov. 1.	Imperial City, Peking, and many neighbouring districts. Followed by a loud noise.
729	1537	Oct.	Yunnan Fu, <i>Yunnan</i> .
30	1539	Aug. 19.	Linan Fu and Chuhsiung Fu, <i>Yunnan</i> , and Pingle Fu, <i>Kuangsi</i> .

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731	1540	May 25.	Taochou, Kungchang, and Kansu (present Kanchou), <i>Kansu</i> .
732	1542	Nov. 14.	Pingyang, <i>Shansi</i> ; Kuyuan, Pingling Fu, Ninghsia Fu, an Taochou, <i>Kansu</i> . Followed by a loud noise.
733	1542	Dec. 26.	Kungchang Fu, Kuyuan, Pingling Fu, <i>Kansu</i> ; Hsian Fu and Fenghsiang Fu, <i>Shensi</i> .
734	1543	April 14.	Taiyuan Fu, <i>Shansi</i> . The ground did not come to rest for ten days, and shocks were followed by a loud noise.
735	1543	May 19.	Fuchou, Changchou, Chuanchou, and Hsinghua Fu, <i>Fukhsien</i> .
736	1544	April 3.	Taiyuan, <i>Shansi</i> . The ground did not come to rest for ten days; the shocks were followed by a loud noise.
737	1548	Aug. 18.	Imperial City, Peking, Shuntien Fu, and Paoting Fu, <i>Chihli</i> .
738	1548	Sept. 22.	Imperial City, Peking, Tengchou Fu, <i>Shantung</i> ; Kuangning in Chaoching Fu, <i>Kuangtung</i> .
739	1551	Oct. 10.	Imperial City, Peking. Shocks followed by a loud noise.
740	1552	Mar. 16.	Fengyang Fu, <i>Anhui</i> . Shock followed by a loud noise.
741	1552	March.	Taiyuan Fu, <i>Shansi</i> . Shock followed by a loud noise.
742	1555	Feb. 3.	<i>Shansi, Shensi, and Honan</i> . Followed by a noise like thunder. The greatest damage was done at Weinan, Chaoyi, Sanyuan, in Hsian Fu, Huachou, Tungchou Fu, <i>Shensi</i> ; Puchou Fu, <i>Shansi</i> . A mountain was displaced and a new mountain was formed on level ground. The land was fissured and water burst forth to form a small pond in which were many small fish. Many houses were destroyed and about 830,000 people were killed. Shocks were repeated several times each day and the ground did not come to rest for several days (B, 1556, January).
743	1558	Feb. 9.	<i>Shensi</i> .
744	1558	April 27.	Changping, Shuntien Fu, <i>Chihli</i> .
745	1558	June 16.	Puchou Fu, <i>Shansi</i> . The ground did not come to rest for three days, and each shock was followed by a loud noise.
746	1558	July 3.	Ditto.
747	1558	Nov. 22.	Huachou, Tungchou Fu, <i>Shensi</i> . Each shock was followed by a loud noise.
748	1558	Nov. 28.	Ditto.
749	1558	Dec. 4.	Huachou, Tungchou Fu, <i>Shensi</i> . Many houses were destroyed.
750	1559	Aug. 25.	Nanking, <i>Kiangsu</i> . Followed by a loud noise.
751	1560	May.	Chihsing Fu, Huchou Fu, <i>Chehkiang</i> . Many fish jumped out of the river.
752	1561	Mar. 3.	Shantan in Katchou Fu, <i>Kansu</i> . Many houses and castles were damaged.
753	1561	Aug. 16.	Taiyuan Fu, Tatung Fu, <i>Shansi</i> ; Yulin Fu, <i>Shensi</i> ; Ninghsia Fu and Kuyuan in Pingling Fu, <i>Kansu</i> . The greatest damage was done at Ninghsia and Kuyuan. Many houses were destroyed, and many people lost their lives.
754	1562	Feb. 24.	Imperial City, Peking, Ninghsia and Hosi, <i>Kansu</i> .
755	1566	Feb. 1.	Fuchou, Hsinghua, and Chuanchou, <i>Fukhsien</i> .
756	1568	April 11.	Hsian Fu, Hanchung Fu, <i>Shensi</i> ; Chingyang Fu, Ninghsia, <i>Kansu</i> ; Puchou Fu, Anyi, <i>Shansi</i> ; also Yunyang, <i>Hupeh</i> .
757	1568	May 5.	Imperial City, Peking, Leting, Yungping Fu, <i>Chihli</i> ; Tengchou, <i>Shantung</i> ; Shunching, <i>Szechuan</i> . The greatest damage occurred at Leting. At two places the land opened for a length of 30 feet and water burst out of the cracks. The Castle of Ningyuen, in <i>Szechuan</i> , was destroyed.
758	1568	May 10.	Huaiching Fu, Nanyang Fu, Juning Fu, <i>Honan</i> , and Ninghsia, <i>Kansu</i> .
759	1568	May 12.	Fenghsiang Fu, Hsian Fu, <i>Shensi</i> ; Pingling Fu, Chingyang Fu, <i>Kansu</i> . Many castles and houses were destroyed and many people were killed.
760	1569	Dec. 28.	Imperial City, Peking.
761	1570	May 15.	Ditto.
762	1571	July 3.	Imperial City, Peking. Shocks repeated three times during the day.

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763	1573	Sept. 7.	Chingchou Fu, <i>Hupeh</i> .
764	1574	Mar. 21.	Changting in Tingchou Fu, <i>Fukhien</i> . The land was cracked and many houses and people were buried.
765	1575	Feb.	Hukuang (comprising the present provinces of <i>Hunan</i> and <i>Hupeh</i>) and <i>Kiangsi</i> .
766	1575	June 19.	Hsiangyang Fu, Yunyang Fu, <i>Hupeh</i> , and Nanyang in <i>Honan</i> . There was a movement for three days.
767	1575	June.	Hsinyang, Juning, <i>Honan</i> .
768	1575	Aug. 7.	Fuchou Fu, Tingchou Fu, Changchou Fu, <i>Fukhien</i> , and Haiyung, Chaozhou Fu, <i>Kuangtung</i> .
769	1575	Nov. 5.	Imperial City.
770	1575	Nov. 15.	Ditto.
771	1575	Nov. 27.	Minchou in Kungchang Fu, <i>Kansu</i> . Shocks were repeated many times during the day.
772	1576	Mar. 26.	Su and Liaotung, <i>Shingking</i> .
773	1576	Mar. 27.	Ditto.
774	1577	Mar. 22.	Tengyueh in Yungchang Fu, <i>Yunnan</i> . During the day there were twenty shocks.
775	1577	Mar. 23.	The same district. A landslip took place; a mountain was displaced; water burst out; many people were killed.
776	1579	Aug. 16.	Imperial City, Peking.
777	1580	July 7.	Tsurhua, Yungping Fu, <i>Chihli</i> . For a week there were many shocks every day.
778	1580	Sept. 16.	Chingping, Pinglu, Pingyang Fu, <i>Shansi</i> . A thousand yards of the castle wall were destroyed.
779	1581	May 27.	Yuchou in Hsuanhua Fu, <i>Chihli</i> ; Tatung Fu and neighbouring districts in <i>Shansi</i> . It was followed by a loud noise.
780	1583	Feb. 27.	Chengtien Fu (now Anlu Fu), <i>Hupeh</i> .
781	1584	Mar. 31.	Imperial City, Peking.
782	1584	June 27.	Ditto.
783	1585	Feb. 7.	Huaian Fu, Yangchou Fu, Chiangning Fu, <i>Kiangsu</i> , and Luchou, <i>Anhui</i> .
784	1585	April 6.	Shanyin in Tatung Fu, <i>Shansi</i> .
785	1585	Sept. 4.	Imperial City, Peking.
786	1586	May 27.	Ditto.
787	1587	April 10.	Kaifeng, Changte, Weihui, and Huaiching Fu, <i>Honan</i> . Three shocks during the day.
788	1587	June.	Taiyuan Fu, <i>Shansi</i> .
789	1588	July 1.	Imperial City, Peking.
790	1589	Aug. 24.	Hangchou Fu, Wenchou Fu, Shaohsing Fu, <i>Chehkiang</i> .
791	1590	July 7.	Kanchou and Lintao, <i>Kansu</i> . The damage was great, and it is impossible to estimate the same. Very many people were killed.
792	1590	Aug.	Fuchou Fu, <i>Fukhien</i> . Very many shocks.
793	1591	April 27.	Changpingchou in Shuntien Fu, <i>Chihli</i> .
794	1591	Nov. 21.	Shantan in Kanchou Fu, <i>Kansu</i> .
795	1595	July 2.	Imperial City.
796	1596	Jan. 21.	Hsian Fu, in <i>Shensi</i> , where the shock was followed by a loud noise.
797	1596	Dec.	Fuchan, <i>Fukhien</i> .
798	1597	Feb. 17.	Ssuchuan in Liaotang, <i>Shingking</i> . The ground was moving for three days.
799	1597	Oct. 2.	Liaoyang and Kuangning, <i>Shingking</i> . Water burst out of the ground, and it did not cease for three days.
800	1597	Oct. 6.	Imperial City, Peking. and neighbouring districts.
801	1598	Feb. 5.	Ditto.
802	1598	Feb. 6.	Ningsia, <i>Kansu</i> .
803	1598	Feb. 7.	Change in Yichang, <i>Hupeh</i> . There was a landslip 20 yards in depth.
804	1598	Sept. 24.	Imperial City. It was followed by a loud noise.
805	1599	Sept. 13.	Chengtien, Anlu Fu, Mienyang, in Hanyang Fu, <i>Hupeh</i> ; Yochou Fu, <i>Hunan</i> .

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806	1600	Mar. 18.	Imperial City, Peking. The shocks were from north-east to south-west, and were repeated twice.
807	1602	May 30.	Shunghsiang in Anlu Fu, <i>Hupeh</i> . Many houses were destroyed.
808	1602	July 2.	Imperial City, Peking.
809	1604	Oct. 25.	Kunchang Fu, <i>Kansu</i> ; Lechuan, Hsian Fu, <i>Shensi</i> ; Paiyang in Kuanghsin Fu, <i>Kiangsi</i> ; Wu in Suchou, <i>Kiangsu</i> . The shocks were repeated ten times in the day; many houses were destroyed and many people were killed. At Paiyang the ground opened for a length of ten yards and water burst out.
810	1605	July 14.	Luchuan in Yulin, <i>Kuangsi</i> . The shock was followed by a loud noise, city walls and houses were destroyed, and many were killed.
811	1605	Nov. 6.	Imperial City, Peking. The motion was from north-east to south-west.
812	1606	July 23.	Taiyuan Fu, <i>Shansi</i> .
813	1607	Sept. 16.	Sungpan, Lungan Fu, Mou, Wenchou, <i>Ssuchuan</i> . The ground moved for several days.
814	1608	Mar. 27.	Imperial City, Peking.
815	1608	Aug. 23.	Ditto.
816	1609	July 13.	Kanchou Fu, <i>Kansu</i> . Many city walls and houses were destroyed, and about 840 people were killed. At Tungkuan, Shaohsing Fu, <i>Chehkiang</i> , the land opened for a length of 870 li (about 310 miles).
817	1612	Mar. 12.	Tali, Wuting, and Chuching Fu, Yunnan Fu, <i>Yunnan</i> .
818	1612	Mar. 13.	Yunnan Fu and Chuching Fu, <i>Yunnan</i> .
819	1612	July 5.	Yunnan Fu and Chuching Fu, <i>Yunnan</i> . Many houses were destroyed.
820	1614	Oct. 24.	Taiyuan Fu, <i>Shansi</i> , and Honan Fu, <i>Honan</i> .
821	1615	Mar. 1.	Yangchou Fu, <i>Kiangsu</i> , and Langshan (now Changyang), Yichang Fu, <i>Hupeh</i> . In Langshan a temple was thrown out of the vertical.
822	1615	Aug. 24.	Chuhsiang Fu, <i>Yunnan</i> . The shock was followed by a loud noise and people were frightened.
823	1615	Dec. 8.	Imperial City, Peking.
824	1616	May	Hsinfeng Fu, Chenchiang Fu, <i>Kiangsu</i> . The ground did not come to rest for twenty-eight days.
825	1617	June 14.	Fengyang Fu, <i>Anhui</i> .
826	1617	June 15.	Ditto.
827	1618	Aug. 15.	Imperial City, Peking.
828	1618	Nov. 17.	Imperial City, Peking, Shenchih, Ningwu Fu, and seventeen other districts in <i>Shansi</i> .
829	1620	Mar. 5.	Yunnan Fu, <i>Yunnan</i> ; Chaoching Fu, Huichou, <i>Kuangtung</i> , and Wuchang, and the whole of <i>Hupeh</i> .
830	1622	Mar. 18.	Tungchang, <i>Shantung</i> ; Honan Fu, <i>Honan</i> ; and Haining, Hanchou Fu, <i>Chehkiang</i> .
831	1622	April 17.	Tungchang and eight other districts in <i>Shantung</i> . Many people were killed and many houses destroyed; the movement did not cease for three days.
832	1622	Oct. 25.	Lungte and neighbouring districts in Pingliang, <i>Kansu</i> . It destroyed the city walls for a length of 30,000 yards; about 11,800 houses were damaged and about 12,000 people were killed or wounded.
833	1622	Dec. 13.	Hsian, <i>Shensi</i> .
834	1623	April 30.	Imperial City, Peking.
835	1623	Oct. 18.	Ditto.
836	1623	Dec. 23.	Yunnan Fu, <i>Yunnan</i> .
837	1624	Feb. 10.	Nanking and six other districts. The greatest damage was at Yangchou Fu, <i>Kiangsu</i> .
838	1624	Feb. 11.	Imperial City, Peking.
839	1624	Mar. 31.	Suchou, Shuntien Fu, and Yungping Fu, <i>Chihli</i> .

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840	1624	April 17.	Leting in Yungping Fu and the neighbouring district of <i>Chihli</i> . The land opened and water burst out: it rose to a height of one foot.
841	1624	April 18.	Ditto.
842	1624	April 21.	Ditto.
843	1624	April 23.	Leting in Yungping Fu. There were three shocks in one day.
844	1624	July 20.	Paoting Fu, <i>Chihli</i> . City walls and houses were destroyed and many people were killed.
845	1624	Sept. 15.	<i>Shensi</i> (Hsian).
846	1625	Jan. 31.	Nanking.
847	1626	June 28.	Taming and Kuangping, <i>Chihli</i> ; Tungchang Fu, <i>Shantung</i> ; Honan Fu, <i>Honan</i> ; and Pingyang, <i>Shansi</i> . The ground did not come to rest for several months: the damage was so great that it was impossible to find out how many houses were destroyed and how many people were killed.
848	1626	Aug. 22.	<i>Honan</i> .
849	1626	Oct. 24.	Fuchou, <i>Fuhkien</i> .
850	1627	Feb. 17.	Ninghsia, <i>Kansu</i> . A stone temple fell and killed many priests.
851	1627		Another shock at Nanking.
852	1627		Ninghsia. The shocks were followed by a loud noise; the ground did not come to rest for several months; there were about one hundred shocks; many buildings were destroyed and many people were killed.
853	1627	Nov. 27.	Nanking. The motion was from north-west to south-east, and it was followed by a loud noise.
854	1628	Oct. 7.	Imperial City, Peking.
855	1630	Oct. 27.	Nanking.
856	1631	July 22.	Lintao and Kungchang, <i>Kansu</i> . Many houses were destroyed and many people and cattle were killed.
857	1632	June 17.	Nanking and Chengtu, <i>Ssuehuan</i> .
858	1632	Nov. 4.	<i>Shansi</i> (Taiyuan).
859	1632	Dec. 31.	<i>Yunnan</i> (Yunnan).
860	1633	Aug. 12.	<i>Shensi</i> (Hsian).
861	1635		<i>Shansi</i> (Taiyuan).
862	1636	April 28.	<i>Fuhkien</i> (Fuchou).
863	1637	Jan. 31.	Nanking, <i>Kiangsu</i> .
864	1637	Sept. 5.	<i>Yunnan</i> .
865	1637	Dec. 7.	Chengtu, <i>Ssuehuan</i> .
866	1638	Jan.	Hsian Fu, <i>Shensi</i> . The ground did not come to rest for several months.
867	1638	Aug. 10.	Liaotung, <i>Shingking</i> .
868	1639	Mar. 9.	Imperial City, Peking.
869	1640	Dec. 23.	Nanking.
870	1641	April 12.	<i>Fuhkien</i> (Fuchou).
871	1641	May 30.	Changsha, <i>Hunan</i> , and <i>Hupeh</i> (Wuchang).
872	1641	June 22.	<i>Kansu</i> (Kungchang).
873	1641	July 9.	<i>Fuhkien</i> (Fuchou).
874	1641	Oct. 25.	<i>Ssuehuan</i> (Chengtu).
875	1642	June 15.	Kuangchou, <i>Kuangtung</i> , and Pingle, <i>Kuangsi</i> .
876	1642	Aug. 22.	<i>Shansi</i> (Taiyuan).
877	1643	Oct.	Fengyang in <i>Anhui</i> .
878	1643	Dec. 16.	<i>Shantung</i> (Chinan).
879	1644	Feb. 8.	Fengyang in <i>Anhui</i> .
880	1644	Feb. 9.	<i>Kuangtung</i> (Kuangchou).
881	1644	Mar. 5.	Nanking.
882	1676	July.	Peking and Tungchou (comprising Tung, Tsunhua, and Yungping), <i>Chihli</i> . Three thousand two hundred and fifty people were killed and the earthquake lasted three months.
883	1720	June 11.	9.45 A.M., at west of Peking. The castle Chacheng destroyed; one thousand people were killed. Shocks continued twenty days.

No.	DATE.	
No.	A.D.	
884	1730	Sept. 30. Peking. About one thousand people were killed and shocks continued until October 8.
885	1817	Jan. 28. 3 A.M., Macao (Aomen) <i>Kuangtung</i> . Two shocks: it was strong at fifty leagues from Macao.
886	1824	Jan. 2. Macao. Slight.
887	1824	Aug. 14. Canton, <i>Kuangtung</i> . Great destruction and many lives lost.
888	1834	Yunnan Fu, <i>Yunnan</i> . The whole city was destroyed.
889	1834	June 28–July 19. Changte Fu, <i>Honan</i> , and on the boundaries of three provinces, Kuangping Fu, Taming Fu, <i>Chihli</i> , Pingyang Fu, <i>Shansi</i> , and Tungchang Fu, <i>Shantung</i> . About forty thousand people were killed; ten thousand houses were destroyed.

The Distribution of Earthquake Destructivity in China.

In the following tables the numbers correspond to the numbers in the preceding catalogue. If a disturbance was severe at several places its number appears after several names. The earthquakes which are said to have shaken the whole of China took place between the years A.D. 600 and 788. At this time the Imperial City was Changan (present Hsian in Shensi). The province of Yunnan was not then included in China.

Imperial cities referred to were as follow :

Changan, Hsian, Shensi, 206 B.C. to A.D. 25 and A.D. 589 to 907.
 Honan (Loyang), Honan, A.D. 26 to 194 and 222 to 265.
 Chengtu, Ssuehuan, A.D. 221 to 263.
 Nanking, Kiangsu, A.D. 222 to 277 and 317 to 589 and 1268 to 1425.
 Taiyuan, Shansi, A.D. 386 to 535.
 Kaifeng, Honan, A.D. 907 to 1278.
 Peking, Chihli, A.D. 1260 to 1368 and 1425 to present time.

Earthquakes at Unknown Places. (91 Entries.)

9, 12, 13, 15, 19, 21, 22, 23, 24, 30, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 49, 50, 51, 53, 70, 71, 76, 90, 91, 96, 104, 133, 135, 137, 138, 139, 142, 160, 161, 162, 163, 165, 170, 171, 173, 174, 175, 176, 178, 179, 180, 181, 182, 183, 184, 185, 186, 189, 190, 192, 193, 195, 196, 197, 212, 235, 275, 293, 382, 395, 399, 400, 401, 411, 435, 436, 428, 438, 439, 440, 450, 458, 481, 500, 614, 640, 641, 642—total, 91.

Earthquakes which Shook the Whole of China. (18 Entries.)

214, 255, 256, 257, 258, 259, 260, 261, 262, 264, 265, 266, 267, 268, 269, 270, 271, 272—total, 18.

Anhui. (33 Entries.)

Anching (lat. 30° 32', long. 117° 07'), 504, 509, 511—total, 3.
 Chu (lat. 32° 15', long. 118° 20'), 380—total, 1.
 Fengyang (lat. 32° 54', long. 117° 35'), 310, 625, 633, 670, 697, 722, 723, 740, 825, 826, 877, 879—total, 12.
 Luchou (lat. 31° 50', long. 117° 15'), 509, 593, 633, 783—total, 4.
 Ningkuo (lat. 30° 50', long. 118° 41'), 545, 683—total, 2.
 Taiping (lat. 31° 18', long. 118° 21'), 109, 118, 119, 124, 125, 150, 151, 152, 633—total, 9.
 Yingchou (lat. 32° 23', long. 116° 30'), 633, 683—total, 2.

Chehkiang. (30 Entries.)

Chihsing (lat. 30° 48', long. 120° 43'), 354, 682, 751—total, 3.
 Chinhua (lat. 29° 11', long. 110° 51'), 708—total, 1.
 Chuchou (lat. 28° 26', long. 119° 57'), 553—total, 1.
 Hangchou (lat. 30° 12', long. 120° 12'), 299, 394, 682, 705, 790, 830—total, 6.

Huchou (lat. $30^{\circ} 45'$, long. $120^{\circ} 3'$), 119, 151, 152, 751—total, 4.
 Ningpo (lat. $29^{\circ} 49'$, long. $121^{\circ} 35'$), 682—total, 1.
 Shaohsing (lat. $29^{\circ} 56'$, long. $120^{\circ} 39'$), 119, 151, 152, 517, 682, 790, 816—total, 7.
 Taichou (lat. $28^{\circ} 54'$, long. $121^{\circ} 06'$), 536, 556—total, 2.
 Tinghai (lat. $30^{\circ} 01'$, long. $122^{\circ} 14'$), 719—total, 1.
 Wenchou (lat. $22^{\circ} 47'$, long. $120^{\circ} 45'$), 331, 524, 790—total, 3.
 Yenchou (lat. $29^{\circ} 27'$, long. $119^{\circ} 35'$), 429—total, 1.

Chihli. (161 Entries.)

Chengte (lat. $40^{\circ} 59'$, long. $117^{\circ} 59'$), 209—total, 1.
 Chengling (lat. $37^{\circ} 38'$, long. $115^{\circ} 42'$), 325, 336, 392, 496, 663—total, 5.
 Hochien (lat. $38^{\circ} 33'$, long. $116^{\circ} 00'$), 133, 323, 362, 364, 365, 693—total, 6.
 Hsuanhua (lat. $49^{\circ} 29'$, long. $116^{\circ} 03'$), 127, 129, 512, 514, 516, 615, 636, 651, 684, 713, 779—total, 11.
 Kuangping (lat. $36^{\circ} 46'$, long. $114^{\circ} 55'$), 315, 817, 889—total, 3.
 Paoting (lat. $38^{\circ} 53'$, long. $115^{\circ} 36'$), 247, 300, 303, 355, 367, 387, 693, 737, 844—total, 9.
 Shangtu (lat. $42^{\circ} 15'$, long. $116^{\circ} 11'$), 291, 296, 422, 423, 424, 448—total, 6.
 Shunte (lat. $37^{\circ} 07'$, long. $114^{\circ} 39'$), 316, 676—total, 2.
 Tsunhua (lat. $40^{\circ} 11'$, long. $117^{\circ} 53'$), 634, 635, 644—total, 3.
 Shuntien, Peking (lat. $39^{\circ} 57'$, long. $116^{\circ} 29'$), 355, 443, 444, 445, 470, 471, 472, 473, 486, 487, 498, 502, 506, 507, 512, 513, 515, 518, 521, 527, 549, 585, 589, 590, 591, 594, 597, 600, 601, 602, 603, 604, 606, 607, 609, 616, 624, 628, 634, 635, 636, 644, 645, 647, 654, 655, 659, 665, 666, 669, 670, 693, 698, 712, 713, 720, 726, 727, 728, 737, 738, 739, 744, 754, 757, 760, 761, 762, 769, 770, 776, 781, 782, 785, 786, 789, 793, 800, 801, 804, 806, 808, 811, 814, 815, 823, 827, 828, 834, 835, 838, 839, 854, 868, 882, 833, 884—total, 97.
 Taming (lat. $36^{\circ} 21'$, long. $115^{\circ} 22'$), 676, 817, 889—total, 3.
 Tientsin (lat. $39^{\circ} 07'$, long. $117^{\circ} 11'$), 315, 362, 368, 612—total, 4.
 Yungping (lat. $39^{\circ} 50'$, long. $118^{\circ} 50'$), 315, 635, 636, 757, 777, 839, 840, 841, 842, 843, 882—total, 11.

Fuhkien. (42 Entries.)

Changchou (lat. $24^{\circ} 31'$, long. $117^{\circ} 43'$), 357, 672, 735, 768—total, 4.
 Chienning (lat. $27^{\circ} 04'$, long. $118^{\circ} 25'$), 14, 116, 357—total, 3.
 Chuanchou (lat. $24^{\circ} 56'$, long. $118^{\circ} 51'$), 357, 446, 447, 672, 708, 714, 735, 755—total, 8.
 Fuhchou (lat. $26^{\circ} 03'$, long. $119^{\circ} 25'$), 563, 564, 580, 631, 672, 714, 735, 755, 768, 792, 797, 849, 862, 870, 873—total, 15.
 Hsinghua (lat. $26^{\circ} 25'$, long. $119^{\circ} 17'$), 350, 557, 672, 714, 735, 755—total, 6.
 Shaowu (lat. $27^{\circ} 22'$, long. $117^{\circ} 33'$), 357, 531—total, 2.
 Tingchou (lat. $25^{\circ} 45'$, long. $116^{\circ} 30'$), 448, 764, 768—total, 3.
 Yenping (lat. $26^{\circ} 38'$, long. $118^{\circ} 18'$), 554—total, 1.

Honan. (138 Entries.)

Changte (lat. $36^{\circ} 07'$, long. $114^{\circ} 30'$), 99, 316, 362, 476, 677, 787, 847, 889—total, 8.
 Honan (lat. $34^{\circ} 43'$, long. $112^{\circ} 28'$), 16, 17, 20, 32, 33, 48, 52, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 67, 68, 69, 72, 73, 74, 75, 78, 79, 80, 81, 82, 88, 93, 95, 105, 106, 110, 115, 126, 130, 132, 153, 154, 253, 291, 307, 310, 316, 377, 479, 561, 633, 718, 720, 742, 820, 830, 847, 848—total, 59.
 Hsu (lat. $34^{\circ} 06'$, long. $114^{\circ} 00'$), 352—total, 1.
 Huaiching (lat. $35^{\circ} 07'$, long. $113^{\circ} 00'$), 362, 373, 476, 496, 538, 722, 723, 758, 787—total, 9.
 Juning (lat. $33^{\circ} 01'$, long. $114^{\circ} 21'$), 144, 618, 758, 767—total, 4.
 Kaifeng (lat. $34^{\circ} 57'$, long. $114^{\circ} 33'$), 131, 311, 314, 317, 322, 323, 324, 330, 339, 341, 344, 351, 356, 358, 359, 360, 361, 365, 371, 388, 396, 397, 398, 407, 408, 409, 410, 413, 414, 415, 416, 417, 418, 419, 420, 421, 431, 433, 476, 519, 522, 658, 677, 717, 722, 723, 787—total, 47.
 Nanyang (lat. $33^{\circ} 07'$, long. $112^{\circ} 34'$), 28, 111, 131, 758, 766—total, 5.
 Shan (lat. $31^{\circ} 45'$, long. $111^{\circ} 03'$), 253, 671—total, 2.
 Weihui (lat. $35^{\circ} 25'$, long. $114^{\circ} 16'$), 362, 658, 787—total, 3.

Hunan. (21 Entries.)

Changsha (lat. $28^{\circ} 12'$, long. $112^{\circ} 47'$), 120, 121, 363, 617, 619, 620, 765, 871—total, 8.

Chenchou (lat. $28^{\circ} 22'$, long. $110^{\circ} 09'$), 136—total, 1.

Hengchou (lat. $26^{\circ} 55'$, long. $112^{\circ} 23'$), 255, 256, 257, 258, 259, 260, 261, 262—total, 8.

Yochou (lat. $29^{\circ} 18'$, long. $113^{\circ} 02'$), 348, 391, 618, 805—total, 4.

Hupei. (47 Entries.)

Anlu (lat. $31^{\circ} 07'$, long. $112^{\circ} 39'$), 539, 780, 805, 807—total, 4.

Chingchou (lat. $30^{\circ} 27'$, long. $112^{\circ} 05'$), 127, 140, 148, 167, 327, 329, 491, 539, 763—total, 9.

Hanyang (lat. $32^{\circ} 32'$, long. $114^{\circ} 14'$), 526, 618, 805—total, 3.

Hsiangyang (lat. $32^{\circ} 06'$, long. $113^{\circ} 05'$), 140, 611, 766—total, 3.

Huangchou (lat. $30^{\circ} 26'$, long. $114^{\circ} 54'$), 509—total, 1.

Wuchang (lat. $30^{\circ} 33'$, long. $114^{\circ} 27'$), 144, 145, 217, 508, 617, 618, 619, 620, 689, 703, 765, 829, 871—total, 13.

Yichang (lat. $30^{\circ} 49'$, long. $111^{\circ} 10'$), 145, 539, 803, 821—total, 4.

Yunyang (lat. $32^{\circ} 49'$, long. $110^{\circ} 52'$), 255, 256, 257, 258, 259, 260, 261, 262, 756, 766—total, 10.

Kansu. (117 Entries.)

Chingyung (lat. $36^{\circ} 03'$, long. $107^{\circ} 43'$), 318, 320, 375, 541, 567, 622, 671, 756, 759—total, 9.

Hosi (lat. $39^{\circ} 00'$, long. $106^{\circ} 00'$), near Ninghsia, 244, 754—total, 2.

Hsining (lat. $35^{\circ} 39'$, long. $101^{\circ} 48'$), 430, 434, 437—total, 3.

Kanchou (lat. $39^{\circ} 00'$, long. $100^{\circ} 56'$), 89, 232, 244, 468, 627, 731, 752, 791, 794, 816—total, 10.

Kungchang (lat. $34^{\circ} 56'$, long. $104^{\circ} 44'$), 10, 11, 18, 20, 31, 34, 57, 62, 97, 98, 100, 144, 242, 313, 333, 462, 491, 499, 503, 517, 542, 566, 567, 626, 643, 731, 732, 733, 771, 809, 856, 872—total, 32.

Lanchou (lat. $36^{\circ} 08'$, long. $103^{\circ} 55'$), 62, 134, 374, 389, 542, 580—total, 6.

Liangchou (lat. $37^{\circ} 59'$, long. $102^{\circ} 48'$), 66, 79, 161, 168, 172, 211, 541, 542, 605, 627, 668—total, 11.

Lintao (lat. $39^{\circ} 40'$, long. $98^{\circ} 20'$), 567, 626, 791, 856—total, 4.

Lingpei (lat. $42^{\circ} 00'$, long. $99^{\circ} 00'$), 482, 484, 490—total, 3.

Ninghsia (lat. $38^{\circ} 33'$, long. $106^{\circ} 08'$), 107, 220, 318, 464, 467, 469, 489, 492, 493, 579, 585, 627, 657, 660, 668, 681, 732, 753, 754, 756, 758, 802, 850, 852—total, 21.

Pingliang (lat. $35^{\circ} 35'$, long. $106^{\circ} 41'$), 333, 374, 432, 541, 512, 643, 732, 733, 753, 759, 832—total, 11.

Suchou (lat. $39^{\circ} 46'$, long. $99^{\circ} 07'$), 237, 244—total, 2.

Kiangsi. (16 Entries.)

Chian (lat. $27^{\circ} 02'$, long. $115^{\circ} 05'$), 145, 169, 188, 353—total, 4.

Chiuchiang (lat. $29^{\circ} 42'$, long. $116^{\circ} 08'$), 187, 188, 765—total, 3.

Chuanhsi (lat. $27^{\circ} 34'$, long. $118^{\circ} 28'$), 705—total, 1.

Fuchou (lat. $27^{\circ} 56'$, long. $116^{\circ} 18'$), 705—total, 1.

Jaouchou (lat. $28^{\circ} 59'$, long. $116^{\circ} 46'$), 505, 510—total, 2.

Jaichou (lat. $28^{\circ} 25'$, long. $115^{\circ} 14'$), 514—total, 1.

Kuanghsin (lat. $28^{\circ} 28'$, long. $118^{\circ} 06'$), 809—total, 1.

Nankang (lat. $29^{\circ} 23'$, long. $116^{\circ} 10'$), 188, 675, 676—total, 3.

Kiangsu. (107 Entries.)

Changchou (lat. $31^{\circ} 47'$, long. $119^{\circ} 56'$), 147, 236, 319, 683, 721—total, 5.

Chenchiang (lat. $32^{\circ} 10'$, long. $119^{\circ} 21'$), 109, 118, 119, 124, 125, 147, 237, 528, 535, 683, 824—total, 11.

Chiangning (Nanking) (lat. $32^{\circ} 05'$, long. $118^{\circ} 47'$), 92, 94, 95, 101, 112, 118, 159, 177, 191, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 570, 577, 578, 584, 586,

587, 588, 592, 595, 596, 597, 598, 599, 608, 610, 623, 633, 656, 659, 664, 665, 670, 673, 674, 679, 680, 683, 703, 718, 720, 721, 750, 783, 837, 846, 851, 853, 855, 857, 863, 869, 881—total, 62.

Haichou (lat. $34^{\circ} 29'$, long. $119^{\circ} 27'$), 662, 663—total, 2.

Hsuehou (lat. $34^{\circ} 11'$, long. $117^{\circ} 32'$), 310, 676, 722, 723—total, 4.

Huailan (lat. $33^{\circ} 25'$, long. $119^{\circ} 22'$), 546, 558, 633, 656, 683, 783—total, 6.

Suchou (lat. $31^{\circ} 28'$, long. $120^{\circ} 44'$), 147, 237, 378, 683, 721, 809—total, 6.

Sungchiang (lat. $31^{\circ} 03'$, long. $121^{\circ} 15'$), 683—total, 1.

Yangchou (lat. $32^{\circ} 21'$, long. $119^{\circ} 15'$), 166, 237, 239, 338, 633, 656, 683, 783, 821, 837—total, 10.

Kuangsi. (9 Entries.)

Pingle (lat. $24^{\circ} 8'$, long. $111^{\circ} 17'$), 122, 123, 568, 730, 875—total, 5.

Taiping (lat. $22^{\circ} 25'$, long. $107^{\circ} 07'$), 629—total, 1.

Wuchou (lat. $23^{\circ} 29'$, long. $110^{\circ} 51'$), 568, 646—total, 2.

Yulin (lat. $22^{\circ} 43'$, long. $109^{\circ} 45'$), 810—total, 1.

Kuangtung. (20 Entries.)

Chaoching (lat. $23^{\circ} 05'$, long. $112^{\circ} 30'$), 485, 738, 829—total, 3.

Chaochou (lat. $23^{\circ} 34'$, long. $116^{\circ} 36'$), 357, 369, 768—total, 3.

Chenchou (lat. $24^{\circ} 40'$, long. $116^{\circ} 30'$), 309—total, 1.

Huichou (lat. $23^{\circ} 02'$, long. $114^{\circ} 13'$), 829—total, 1.

Kuangchou (lat. $23^{\circ} 08'$, long. $111^{\circ} 17'$), 120, 121, 347, 580, 875, 880, 887—total, 7.

Leichou (lat. $20^{\circ} 52'$, long. $109^{\circ} 40'$), 550—total, 1.

Lienchou (lat. $21^{\circ} 39'$, long. $108^{\circ} 59'$), 646—total, 1.

Macao, or Aomen (lat. $22^{\circ} 12'$, long. $113^{\circ} 30'$) 885, 886—total, 2

Nanhsiung (lat. $25^{\circ} 26'$, long. $113^{\circ} 52'$), 555—total, 1.

Kueichou. (4 Entries.)

Hsingyi (lat. $25^{\circ} 15'$, long. $106^{\circ} 00'$), 661, 674, 724, 725—total, 4.

Shansi. (182 Entries.)

Chiang (lat. $35^{\circ} 37'$, long. $111^{\circ} 29'$), 240, 297, 298, 337, 684—total, 5.

Fenchou (lat. $37^{\circ} 19'$, long. $111^{\circ} 41'$), 240, 538, 543, 544, 559, 560, 565—total, 7.

Hsi (lat. $36^{\circ} 40'$, long. $110^{\circ} 56'$), 253, 474, 475, 477, 494, 495, 501, 565—total, 8.

Hsun (lat. $38^{\circ} 26'$, long. $112^{\circ} 43'$), 228, 338, 340, 342, 343, 345, 346, 538, 560—total, 9.

Luan (lat. $36^{\circ} 07'$, long. $113^{\circ} 13'$), 668, 677—total, 2.

Ningwu (lat. $39^{\circ} 15'$, long. $112^{\circ} 00'$), 828—total, 1.

Pingyang (lat. $36^{\circ} 06'$, long. $111^{\circ} 33'$), 77, 83, 84, 85, 86, 87, 106, 221, 222, 223, 224, 225, 226, 227, 240, 308, 318, 402, 403, 404, 405, 406, 425, 426, 427, 449, 453, 454, 456, 459, 466, 473, 534, 538, 540, 671, 677, 732, 778, 847, 889—total, 41.

Puchou (lat. $34^{\circ} 54'$, long. $100^{\circ} 15'$), 77, 83, 84, 85, 86, 87, 106, 155, 156, 157, 158, 221, 222, 223, 224, 225, 226, 227, 253, 276, 298, 307, 308, 318, 402, 403, 404, 405, 406, 463, 464, 534, 671, 673, 684, 742, 745, 746, 756—total, 39.

Soping (lat. $40^{\circ} 10'$, long. $112^{\circ} 13'$), 294, 615—total, 2.

Tatung (lat. $39^{\circ} 39'$, long. $113^{\circ} 14'$), 337, 455, 457, 615, 678, 699, 753, 779, 784—total, 9.

Taichou (lat. $39^{\circ} 06'$, long. $112^{\circ} 58'$), 334, 340, 342, 372, 386, 637—total, 6.

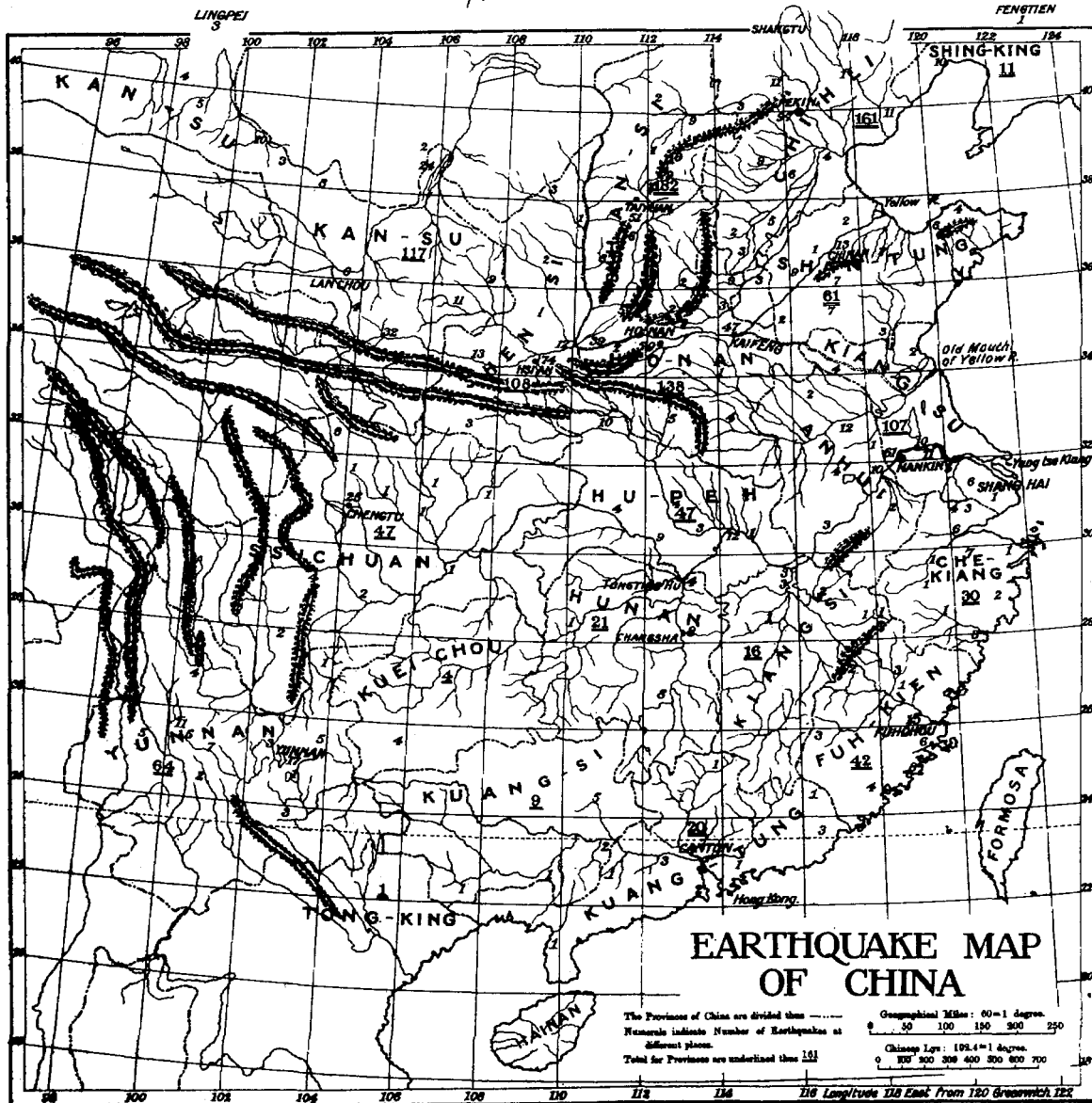
Taiyuan (lat. $37^{\circ} 54'$, long. $112^{\circ} 31'$), 8, 146, 177, 210, 295, 297, 298, 305, 312, 340, 342, 376, 381, 384, 385, 386, 453, 456, 459, 465, 478, 480, 520, 537, 538, 548, 551, 560, 565, 569, 571, 572, 573, 574, 575, 576, 585, 666, 668, 699, 720, 734, 736, 741, 753, 788, 812, 820, 858, 861, 876—total, 51.

Tsechou (lat. $35^{\circ} 30'$, long. $112^{\circ} 50'$), 82, 677—total, 2.

Shantung. (61 Entries.)

Chinan (lat. $36^{\circ} 40'$, long. $117^{\circ} 1'$), 1, 526, 528, 532, 533, 562, 583, 586, 707, 717, 718, 720, 878—total, 13.

Chining (lat. $36^{\circ} 50'$, long. $116^{\circ} 58'$), 705—total, 1.



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- Chingchou (lat. $36^{\circ} 44'$, long. $118^{\circ} 44'$), 349, 529, 530, 532, 534, 552, 707—total, 7.
 Laichou (lat. $37^{\circ} 10'$, long. $126^{\circ} 10'$), 17, 523, 529, 532, 687, 707—total, 6.
 Taian (lat. $36^{\circ} 10'$, long. $117^{\circ} 15'$), 29, 362, 526, 527, 533, 638, 639—total, 7.
 Tengchou (lat. $37^{\circ} 45'$, long. $120^{\circ} 42'$), 350, 707, 738, 757—total, 4.
 Tsaouchou (lat. $35^{\circ} 20'$, long. $115^{\circ} 35'$), 301, 676—total, 2.
 Tungchang (lat. $36^{\circ} 37'$, long. $116^{\circ} 12'$), 310, 383, 668, 676, 717, 830, 831, 847, 889—total, 9.
 Wuting (lat. $37^{\circ} 32'$, long. $117^{\circ} 41'$), 667, 693—total, 2.
 Yenchou (lat. $35^{\circ} 47'$, long. $116^{\circ} 59'$), 29, 141, 194, 526, 533, 633, 676—total, 7.
 Yichou (lat. $35^{\circ} 15'$, long. $118^{\circ} 35'$), 380, 525, 627—total, 3.

Shensi. (108 Entries.)

- Fenghsiang (lat. $34^{\circ} 35'$, long. $107^{\circ} 50'$), 2, 3, 4, 5, 6, 7, 79, 215, 491, 648, 671, 733, 759—total, 13.
 Hanchung (lat. $32^{\circ} 56'$, long. $107^{\circ} 12'$), 491, 648, 756—total, 3.
 Hsian (lat. $34^{\circ} 17'$, long. $108^{\circ} 58'$), 26, 27, 141, 143, 213, 216, 218, 229, 230, 231, 233, 234, 241, 243, 245, 246, 248, 249, 250, 251, 252, 254, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 276, 277, 278, 279, 280, 282, 283, 284, 285, 286, 287, 288, 289, 290, 292, 294, 302, 304, 318, 373, 374, 390, 488, 565, 566, 671, 718, 720, 733, 742, 743, 756, 759, 796, 809, 833, 845, 860, 866—total, 74.
 Suite (lat. $37^{\circ} 38'$, long. $110^{\circ} 03'$), 386—total, 1.
 Tungchou (lat. $34^{\circ} 50'$, long. $109^{\circ} 51'$), 370, 402, 403, 404, 405, 406, 671, 685, 742, 747, 748, 749—total, 12.
 Yen-an (lat. $36^{\circ} 42'$, long. $109^{\circ} 28'$), 460, 461—total, 2.
 Yulin (lat. $38^{\circ} 18'$, long. $109^{\circ} 33'$), 627, 668, 753—total, 3.

Shingking. (11 Entries.)

- Fengtien (lat. $41^{\circ} 10'$, long. $123^{\circ} 27'$), 799—total, 1.
 Liaotung, or Chinchou (lat. $41^{\circ} 06'$, long. $121^{\circ} 18'$), 197, 483, 497, 635, 636, 772, 773, 798, 799, 867—total, 10.

Ssuehuan. (47 Entries.)

- Chengt'u (lat. $30^{\circ} 41'$, long. $103^{\circ} 11'$), 102, 103, 107, 108, 113, 128, 238, 306, 321, 326, 332, 379, 393, 441, 491, 613, 630, 649, 650, 652, 653, 696, 857, 865, 874—total, 25.
 Chiating (lat. $29^{\circ} 28'$, long. $103^{\circ} 55'$), 25, 113, 114, 442—total, 4.
 Hsuehchou (lat. $28^{\circ} 38'$, long. $104^{\circ} 46'$), 366, 699—total, 2.
 Lungan (lat. $32^{\circ} 38'$, long. $103^{\circ} 36'$), 107, 108, 113, 117, 149, 219, 442, 813—total, 8.
 Mou (lat. $31^{\circ} 40'$, long. $106^{\circ} 15'$), 813—total, 1.
 Paoning (lat. $31^{\circ} 32'$, long. $105^{\circ} 59'$), 318—total, 1.
 Ningyuan (lat. $27^{\circ} 50'$, long. $102^{\circ} 12'$), 335, 632—total, 2.
 Shunching (lat. $30^{\circ} 49'$, long. $106^{\circ} 08'$), 757—total, 1.
 Chungching (lat. $29^{\circ} 42'$, long. $106^{\circ} 42'$), 696—total, 1.
 Suiting (lat. $31^{\circ} 27'$, long. $107^{\circ} 51'$), 412—total, 1.
 Tungchuan (lat. $31^{\circ} 9'$, long. $105^{\circ} 11'$), 696—total, 1.

Tongking. (1 Entry.)

- Jihnan (lat. $24^{\circ} 26'$, long. $108^{\circ} 25'$), 330.

Yunnan. (64 Entries.)

- Chaotung (lat. $27^{\circ} 20'$, long. $103^{\circ} 50'$), 462—total, 1.
 Chengchiang (lat. $24^{\circ} 42'$, long. $103^{\circ} 04'$), 706—total, 1.
 Ohingtung (lat. $24^{\circ} 31'$, long. $101^{\circ} 4'$), 704, 716—total, 2.
 Chuhsiang (lat. $25^{\circ} 06'$, long. $101^{\circ} 43'$), 690, 691, 694, 704, 715, 730, 822—total, 7.
 Chuching (lat. $25^{\circ} 32'$, long. $103^{\circ} 50'$), 659, 700, 817, 818, 819—total, 5.
 Lichiang (lat. $26^{\circ} 52'$, long. $100^{\circ} 27'$), 281, 621, 692, 715—total, 4.
 Linan (lat. $24^{\circ} 18'$, long. $103^{\circ} 5'$), 326, 706, 730—total, 3.
 Menghua (lat. $25^{\circ} 18'$, long. $100^{\circ} 30'$), 704, 709, 710, 711, 715—total, 5.

Tali (lat. $75^{\circ} 44'$, long. $100^{\circ} 22'$), 692, 700, 701, 702, 704, 703, 710, 711, 715, 817, 818, 819—total, 11.

Wuting (lat. $25^{\circ} 32'$, long. $102^{\circ} 33'$), 817, 818, 819—total, 3.

Yunnan (lat. $25^{\circ} 06'$, long. $102^{\circ} 52'$), 451, 452, 581, 582, 686, 688, 700, 715, 729, 817, 818, 819, 829, 836, 859, 864, 888—total, 17.

Yungchang (lat. $25^{\circ} 05'$, long. $99^{\circ} 26'$), 695, 724, 725, 774, 775—total, 5.

Monthly and Seasonal Distribution of Earthquakes.

Warm Season						Cold Season						With Date of Year only	Total
Spring			Summer			Autumn			Winter				
Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.		
78	66	72	65	67	67	66	62	60	65	68	77	76	889
216		199				188			210			—	—
415						398						—	—