THE WORLDWIDE CO-ORDINATION OF NATURAL DISASTER RELIEF

An outline and preliminary exercise to show the nature, location and frequency of natural disasters throughout the world during a ten year period 1961-70 towards an assessment of the location, extent and function of relief zones as a basis for the organisation of international relief.

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Sources of Information

"Earthquakes" G. A. Eiby 1957
(including "John Milne's Catalogue of Destructive Earthquakes")
"The Elements Rage" E. W. Lane 1966
"Earthquake" Allen Andrews 1963
OXFAM Press Files 1958-1972
"Assistance in Cases of Natural Disaster" UNESCO 1971

The study of the pattern of earthquakes from 1500 AD which forms the appendix to this paper is based on John Milne's "Catalogue of Destructive Earthquakes". Records of other natural disasters for the ten year period are collected principally from OXFAM files and from the League of Red Cross Society's information given in the UNESCO publication.

Clearly the results of any study will rely on sources of research material. Those listed are inadequate in that the League of Red Cross Society's information does not include any from the U.S.S.R. or Japan and conversely information on earthquakes in some other areas (e.g. New Zealand) may be comparatively over elaborate.

Disaster Severity

For the purpose of this exercise which is concerned with world-wide relief, earthquakes in excess of 7 on the Richter Scale have been included. (The scale is logarithmic x 10 and runs from 1-8). Earthquake magnitude was first recorded in 1904. It is not known what basis Milne took for those earthquakes included in his "Catalogue".

Although the magnitude of earthquakes can be measured, it can be imagined that the effect on life and property may not always be in direct proportion to the scale degree and in any case not always the same. Cyclones may be measured according to their duration and wind speed but there appears to be no scientific way to measure floods or volcanoes but for them to be assessed by their effect on life and property.

The World Maps

In this paper disasters have been shown on separate maps for cyclones (including typhoons and hurricanes), floods and earthquakes. Other disasters occurring with lesser frequency have been shown on one other map (fire, volcanic eruption, avalanche, epidemic, famine, drought) although epidemics, famine and drought could be classified apart as disasters occurring with some greater degree of warning.

Earthquakes occurring before 1961 have been made the subject of a further map and accompanying chart. Other disasters occurring before 1961 have been shown on the same map as those within the ten year period but have been individually dated. It may well be that any ten year period or in particular this most recent period is inadequate or insufficiently typical to form the basis for firm conclusions. The broader patterns may be of significance in this respect.

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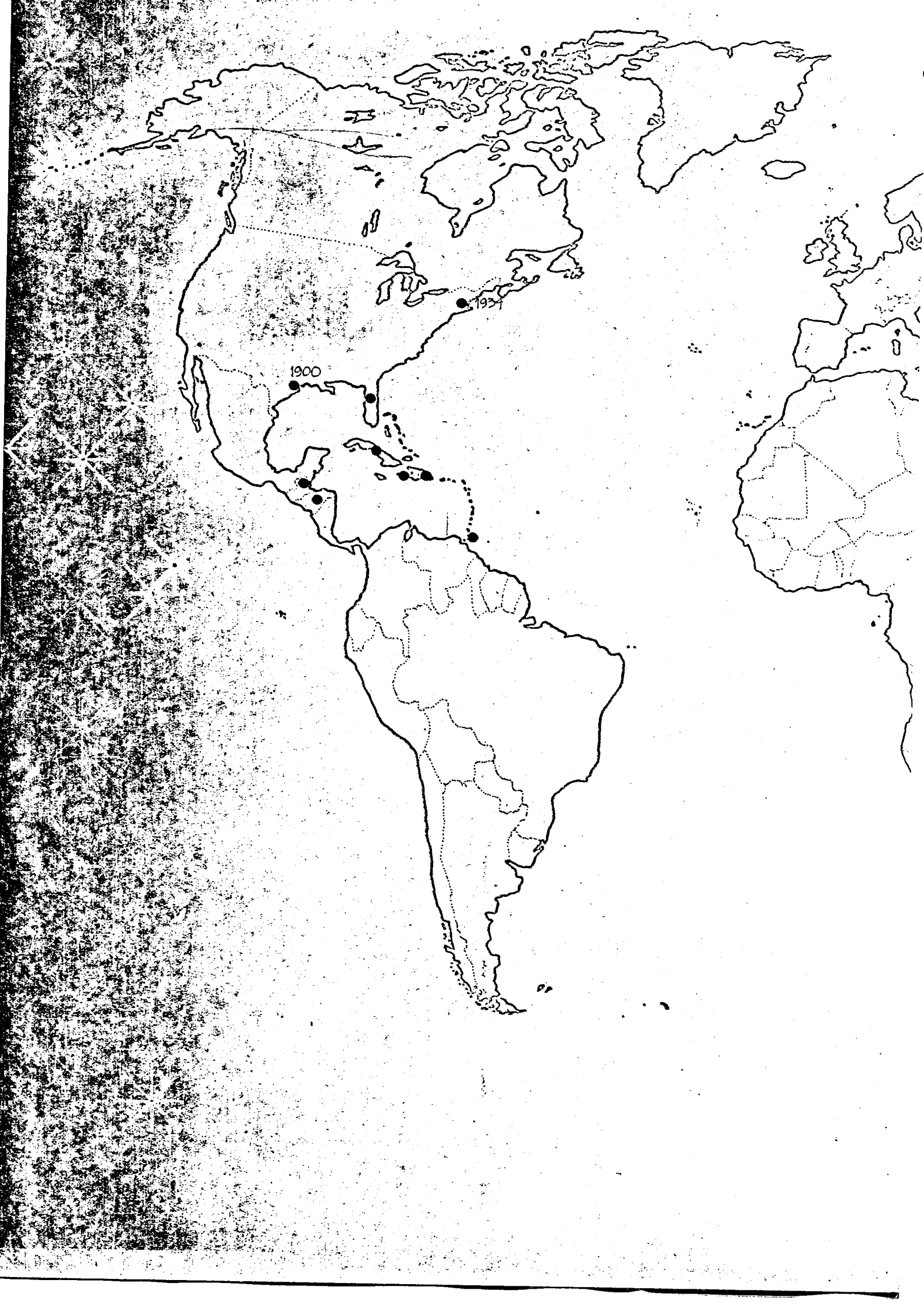
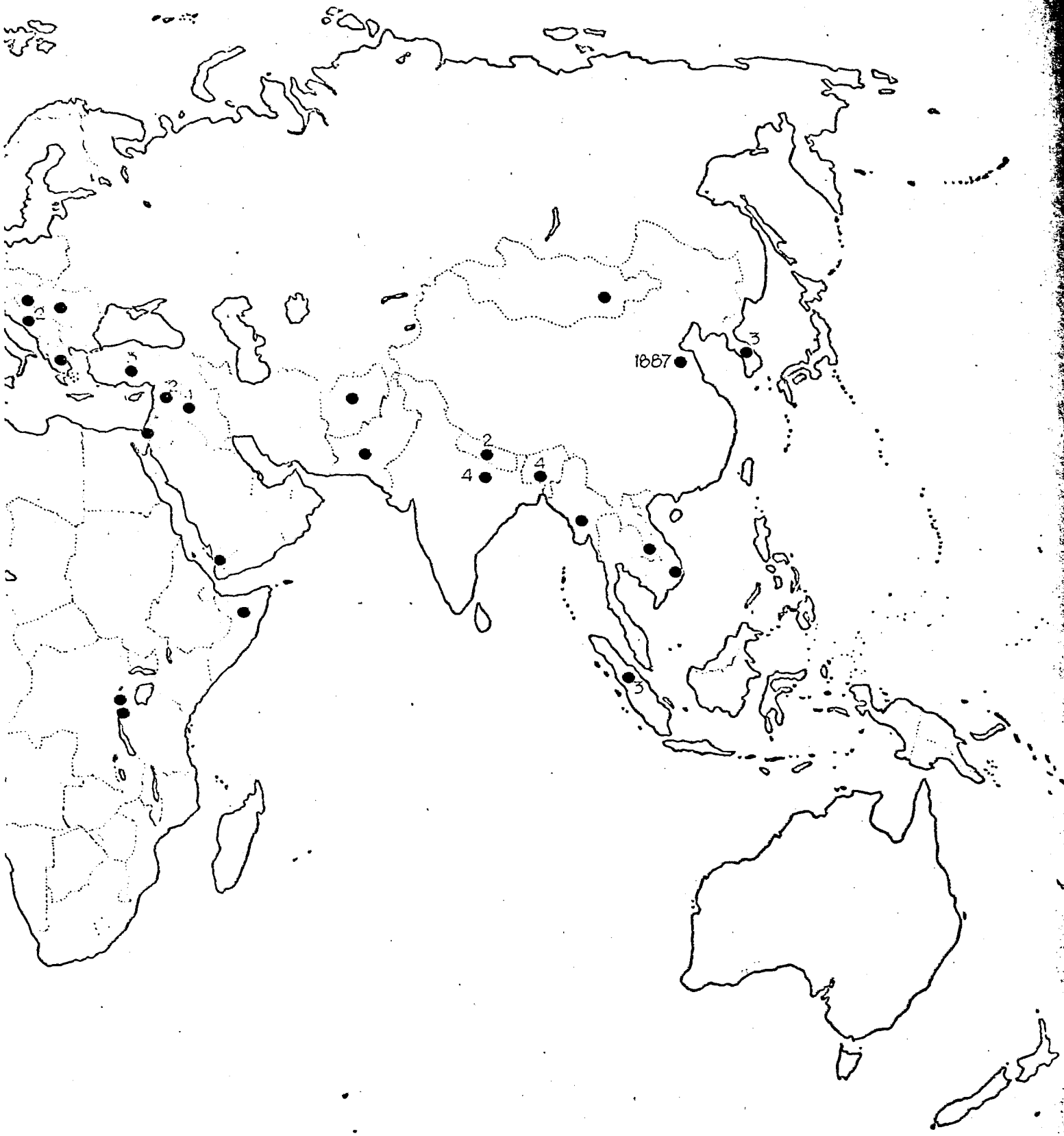
Earthquakes 1961–70

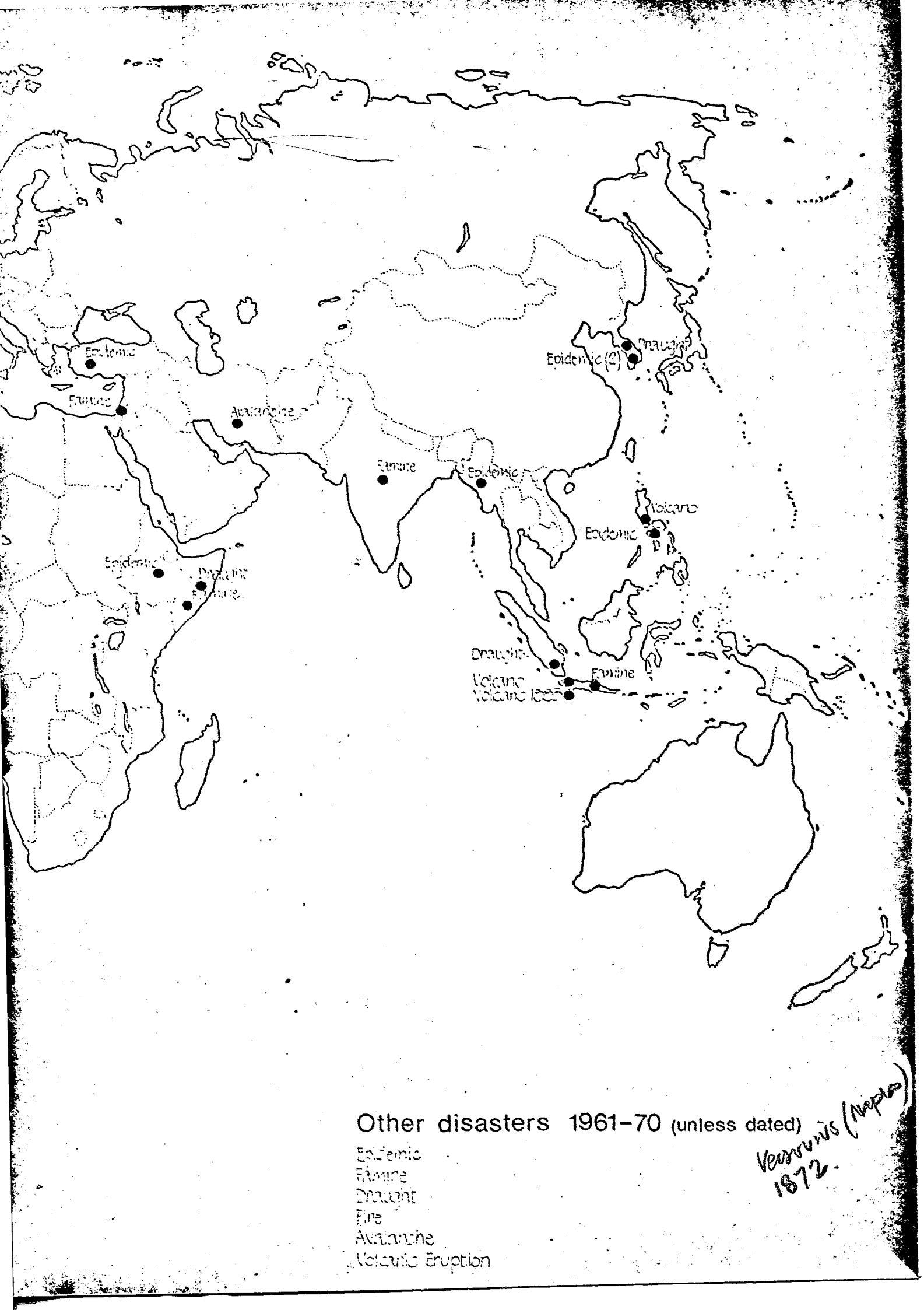
Cyclones (hurricanes & typhoons) 1961–70

(unless dated)


1934
1900



Floods 1961-70 (unless dated)



Other disasters 1961–70 (unless dated)

Epidemic
Famine
Drought
Fire
Avalanche
Volcanic Eruption

Vesuvius (Naples) 1872.

Avalanche
Fire (2)
Volcano
Fire

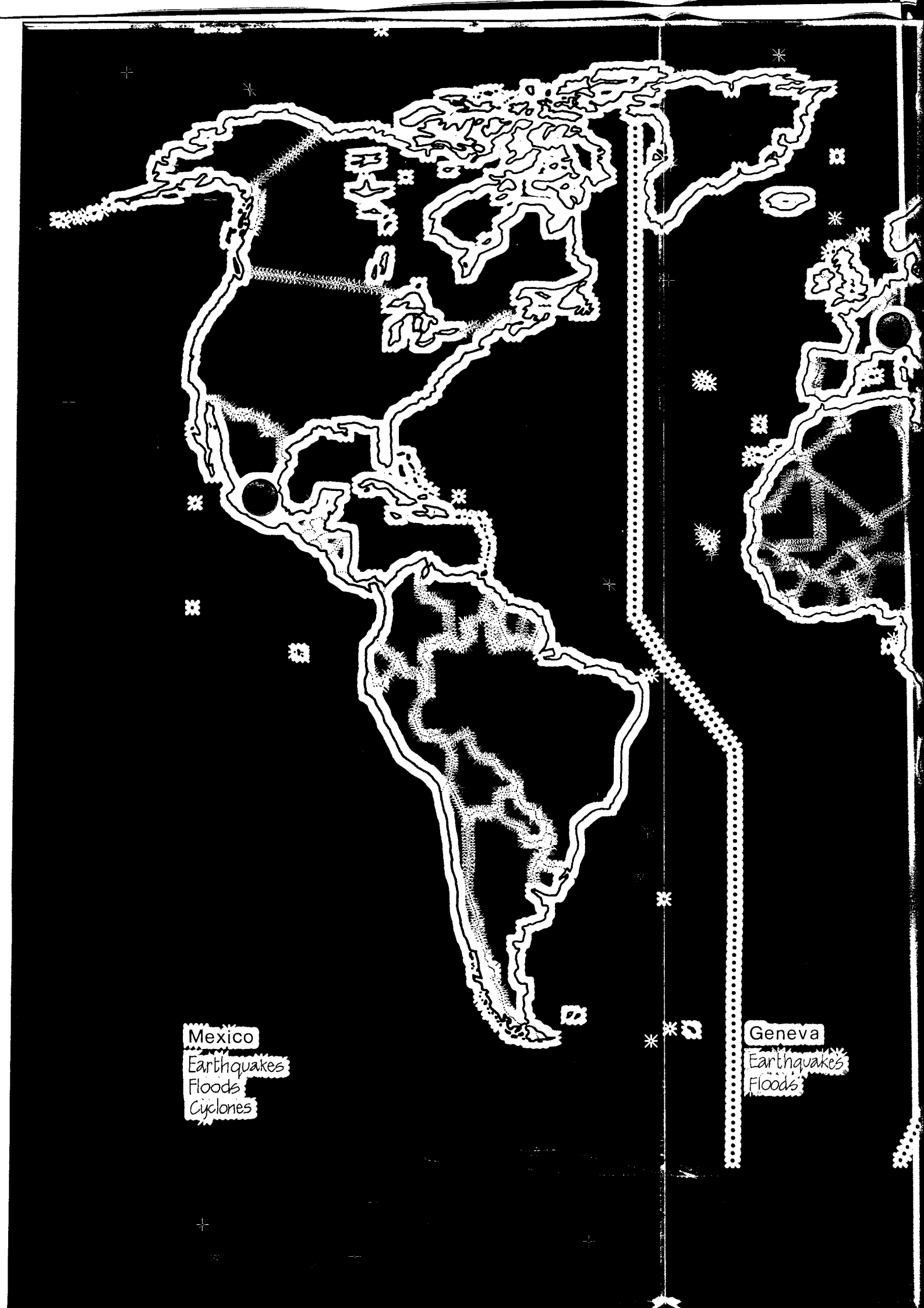
Relief Action

Whilst any disaster is catastrophe to its victims and the more victims the greater the task for relief forces, clearly the sum total of effect cannot be assessed until sometime after the event whereas relief must be made available immediately disaster strikes. The call and the response therefore would not depend upon statistics but on the immediate assessment of the initial effect on life, property and communications. Statistics are used in this exercise to indicate where such disasters might strike again.

Upon the on-the-spot assessment will depend decisions for the call of relief and whether or not this is promulgated on a national or international network. Whether or not resources for aid in organisation or equipment are readily available to meet the demand would affect such decisions. Thus the establishing of strategically placed stockpiles for international use throughout the world would seem to be one effective step towards world wide disaster preparedness.

The map showing relief zones has been produced as an overlay so that each kind of anticipated disaster type within a zone can be readily studied. As can be seen, disasters do tend to occur within three principal geographical areas:- The Americas; Central Europe, West Asia and Africa; the Far East. However, there does not appear to be any practical distinction of disaster type between these areas. Cyclones (by the inclusion of Mauritius and

Madagascar in Zone Singapore) are seen as unlikely to occur in Zone Geneva but it is in this latter Zone that most flooding has occurred. Furthermore it may be that most relief equipment is common to all disaster types, i.e. helicopters, medical and first aid supplies, tents, blankets, food and cooking equipment. The exception may be boats and associated equipment for the 'wet' disasters of both cyclone and flood. The 'dry' disaster - earthquakes - are common to all three zones and perhaps call in particular for equipment for excavation.


Mexico
Earthquakes
Floods
Cyclones
Geneva
Earthquakes
Floods

Singapore
Earthquakes
Floods
cyclones
Relief zones

APPENDIX

Earthquakes before 1961

The chart with time/place scales is an experiment to find whether or not the graphic patterns produced would indicate at a glance the earthquake frequency. The overall pattern is of course influenced by the order of locations and further, the chart as it is cannot show where more than one earthquake has occurred in the same year at one location whereas the list can.

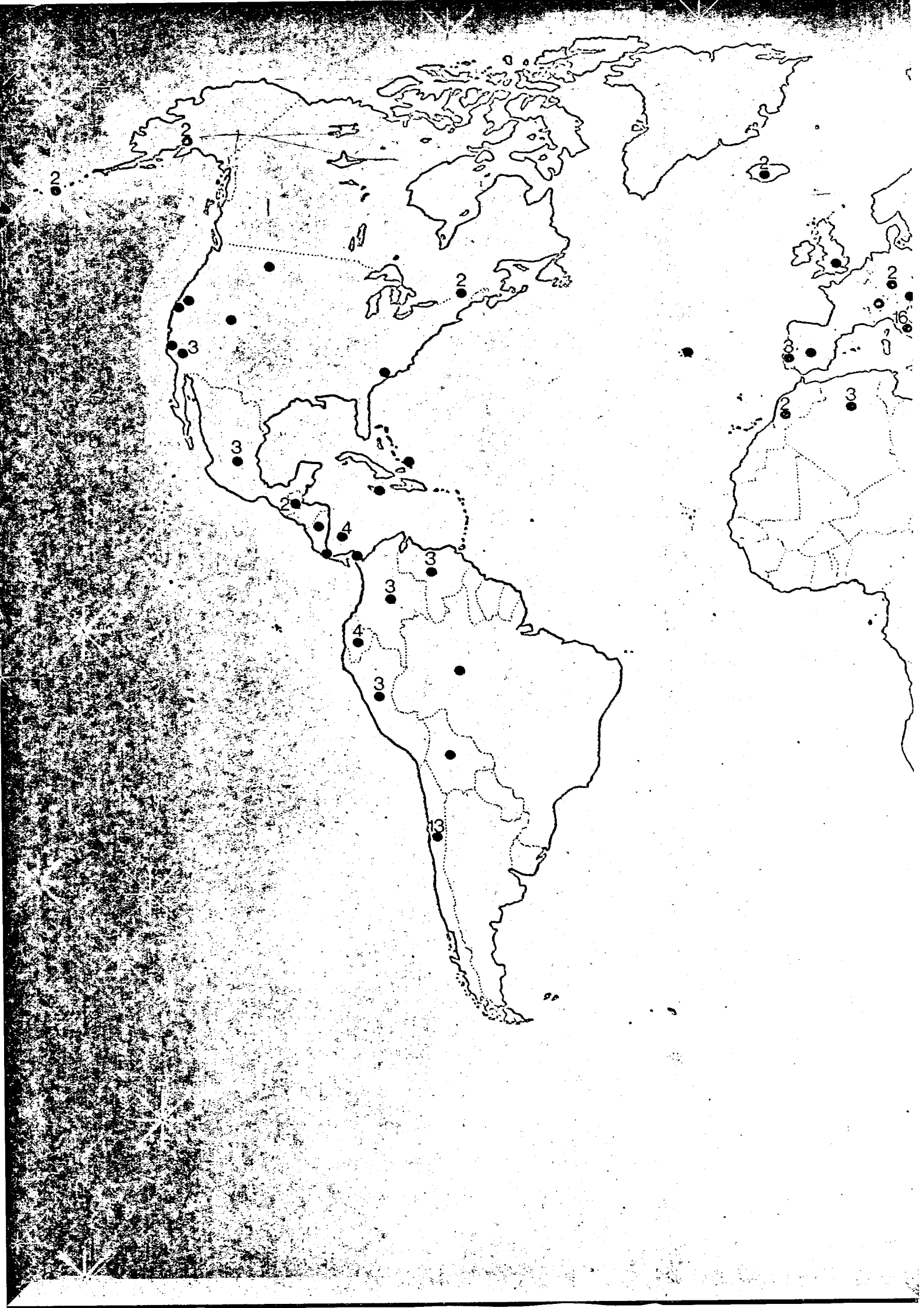
Nevertheless the regular earthquake frequencies can be quickly spotted e.g. Chile, Turkey, Greece, Italy, Sicily, Japan, New Zealand; and one or two odd patterns emerge: Portugal - one every 200 years? China - an earthquake free period of 275 years?

Records again appear incomplete and therefore unreliable. For instance there are no earthquakes shown for Japan before 1880.

ALASKA	1899	1900	1964			
ALEUTIAN IS.	1906	1929				
ALGERIA	1710	1867	1954			
AUSTRALIA	1941	1944				
AUSTRIA	1556					
AZORES	1757					
BOLIVIA	1868					
BRAZIL	1942					
BURMA	1912	1941				
CAROLINE IS.	1918					
CELEBES	1932	1934	1939	1943		
CHILE	1730	1751	1822	1835	1847	1864
	1868	1877	1906	1922	1928	1960
	1965	1971				
CHINA	1556	1609	1622	1906	1920	1927
COLOMBIA	1812	1875	1906	1967		
COSTA RICA	1904					
CYPRUS	1718					
ECUADOR	1859	1868	1906	1942		
EL SALVADOR	1965					
ENGLAND	1580					
FIJI	1920					
GERMANY	1510	1556				
GREECE	1514	1638	1769	1786	1791	1810
	1825	1853	1858	1883	1885	1886
	1893	1893	1895	1899	1965	1967
	1926					

GUATAMALA	1773	1942				
HAWAII	1917					
HUNGARY	1763	1897	1898			
ICELAND	1706	1896				
INDIA	1737	1819	1827	1833	1897	1905
	1934	1958				
ITALY/SICILY	1509	1638	1688	1703	1741	1783
	1786	1789	1799	1805	1823	1832
	1846	1857	1870	1883	1908	1968
IRAN	1505	1549	1721	1727	1853	1883
	1895	1960	1962	1960		
JAMAICA	1692					
JAPAN	1880	1889	1891	1896	1900	1906
	1911	1923	1927	1930	1933	1946
	1950	1952	1953	1964		
JUGOSLAVIA	1962	1963	1969			
KERMADEC IS.	1951					
LIBYA	(1961-70?)					
LOYALTY IS.	1910					
MACQUARIE IS.	1943					
MALAYSIA	1847	1899	1847	1861	1938	
MALTA	1693					
MARIANA IS.	1914					
MEXICO	1907	1932	1951	1964		
MORROCCO	1931	1960				
NEPAL	(1961-70?)					
NEW CALEDONIA	1875					
NEW GUINEA	1906	1914	1916			

NEW ZEALAND	1848	1855	1888	1893	1897	1901	
	1904	1914	1914	1921	1928	1929	
	1929	1931	1932	1942	1947	1950	1951
NICARAGUA	1847						
PANAMA	1904						
PERU	1687	1940	1946	1966	1970		
PHILLIPINES	1658	1728	1880	1897	1902	1924	
	1943	1948					
PORTUGAL	1531	1755	1941				
RUMANIA	1879	1790					
RUSSIA: CENTRAL	1679	1828	1904	1840	1949	1905	
	1905						
RUSSIA: EAST	1904	1904	1904	1915	1923	1952	
RUSSIA: WEST	1596	1885	1911	1911			
SANTA CRUZ IS.	1934	1966					
SOLOMON IS.	1939						
SOUTH AFRICA	1942						
SPAIN	1531						
SWITZERLAND	1618						
TAIWAN	1920	1966					
TIBET	1833	1951					
TONGA	1916	1919	1932	1937			
TURKEY	1509	1558	1688	1719	1759	1796	
	1829	1894	1895	1962	1966	1967	
	1970	1971	1939				
USA: EAST AND CANADA	1663	1886	1925	1925			
USA: WEST	1811	1857	1872	1906	1915	1940	
	1971						
VENEZUELA	1766	1812	1875				
WEST PAKISTAN	1935						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16
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3
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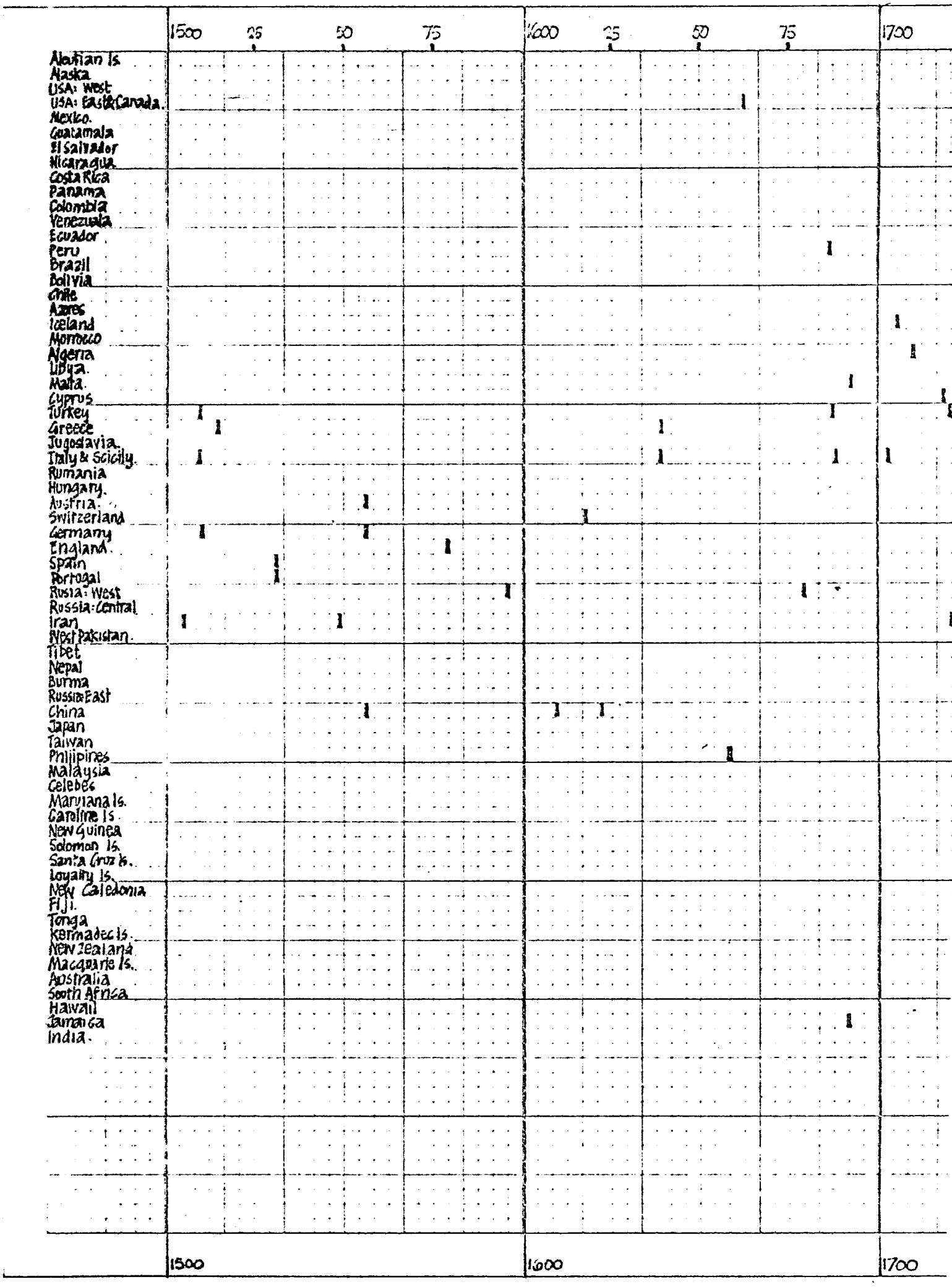
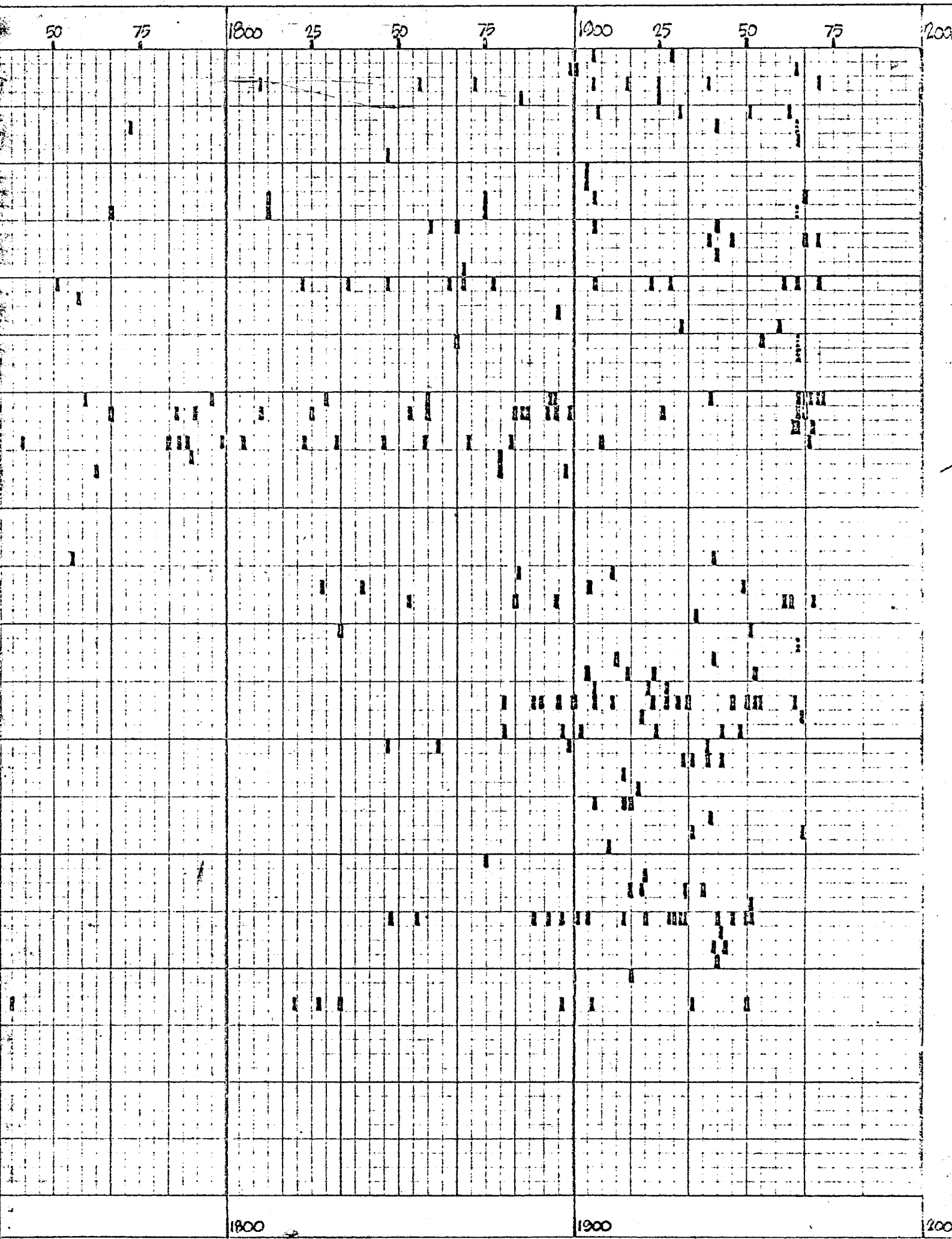
Earthquakes before 1960


1500
25
50
75
1600
25
50
75
1700
Aleutian Is
Alaska
USA: West
USA: East & Canada
Mexico
Guatamala
El Salvador
Nicaragua
Costa Rica
Panama
Colombia
Venezuela
Ecuador
Peru
Brazil
Bolivia
Chile
Azores
Iceland
Morocco
Algeria
Libya
Malta
Cyprus
Turkey
Greece
Jugoslavia
Italy & Scicily
Rumania
Hungary
Austria
Switzerland
Germany
England
Spain
Portugal
Russia: West
Russia: Central
Iran
West Pakistan
Tibet
Nepal
Burma
Russia: East
China
Japan
Taiwan
Philipines
Malaysia
Celebes
Mariana Is
Caroline Is
New Guinea
Solomon Is
Santa Cruz Is
Loyalty Is
New Caledonia
Fiji
Tonga
Kermadec Is
New Zealand
Macquarie Is
Australia
South Africa
Hawaii
Jamaica
India
1500
1600
1700



Earthquakes: Time/place relationship