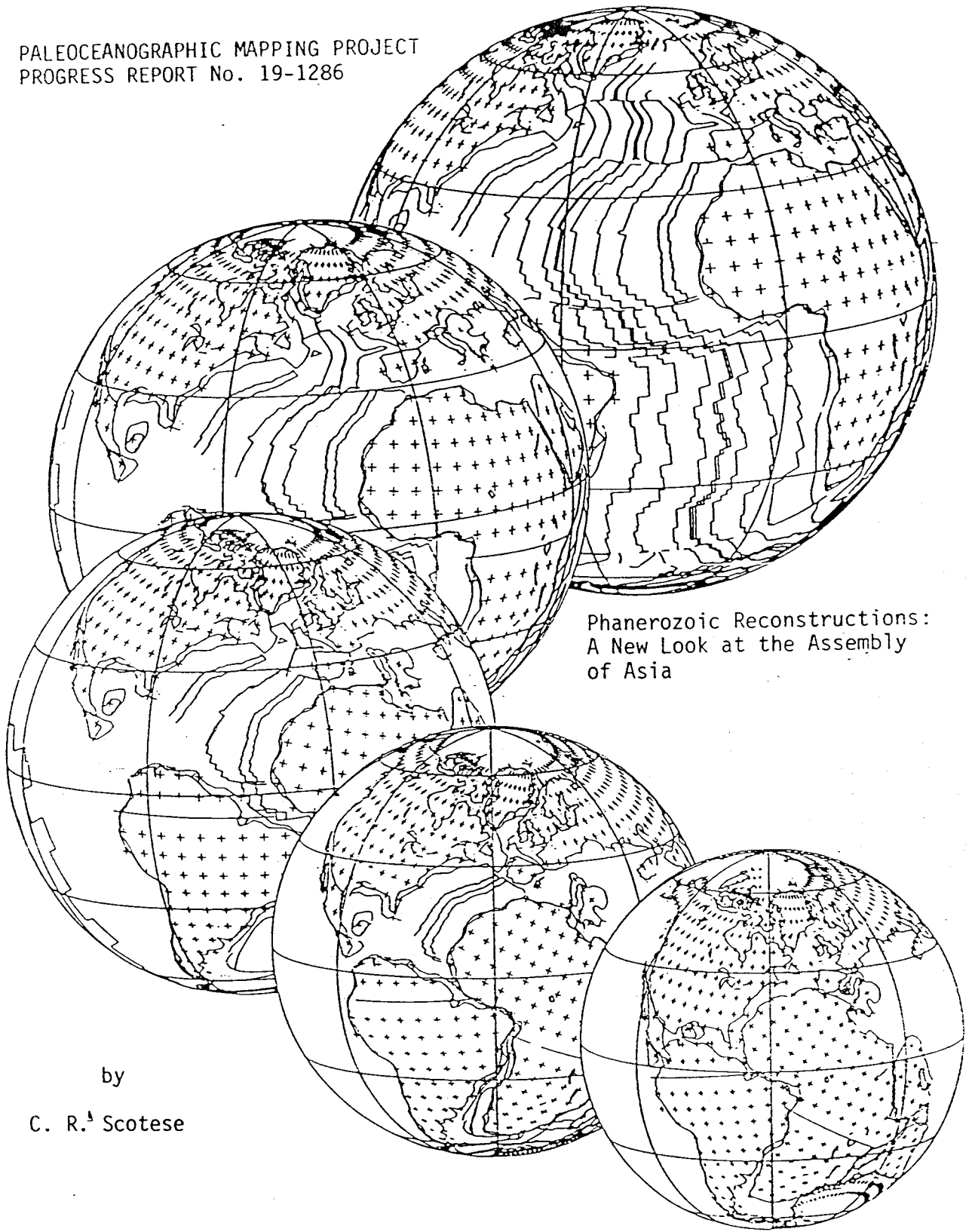


PALEOCEANOGRAPHIC MAPPING PROJECT
PROGRESS REPORT No. 19-1286



Phanerozoic Reconstructions:
A New Look at the Assembly
of Asia

by
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Phanerozoic Reconstructions: A New Look at the Assembly of Asia

The enclosed set of maps illustrate the changing positions of the continents during the Phanerozoic (600 Ma - present). The rotation parameters used to produce these maps are stored in the file PZMZ.ROT, which is a combination of the files MESO.ROT and PALEO.ROT. These maps were produced using the 1985 version of SUTURE.DAT and FAST.DAT (low resolution). Table A lists the times for which reconstructions have been made.

These maps include several significant modifications:

1. A new Early Paleozoic reconstruction of eastern Gondwanaland includes the Shan-Thai block, as well as Indochina (after Audley-Charles, 1983) and the South China Platform. The position of S. China in this reassembly is based on Early Cambrian paleomagnetic data from Lin et al. (1985).
2. The Paleozoic positions of the North and South China platforms is based on the work of Lin et al. (1985), McElhinny et al. (1981), and Lin and Lian (1984).
3. The evolution of the Iapetus Ocean is taken from McKerrow and Scotese (in prep.).
4. A scenario is proposed for the assembly of Asia which suggests that: a) the North China, South China, Indochina, and the Shan-Thai block had collided by late Triassic - early Jurassic times to form the "Cathaysian block". b) A V-shaped seaway between the Cathaysian block and Siberia (Stanovoy Zone) closed during the late Jurassic - early Cretaceous. c) Tibet, Iran, and Turkey formed the southern margin of Asia (northern boundary of Tethys) during the Late Mesozoic. During the Late Cretaceous this margin was located at 10 degrees N latitude (Achache et al., 1983). d) Greater India collided with Asia 50 million years ago. e) As a result of the collision S.E. Asia and China were extruded southeastwards. f) Sinistral motion between Indochina and the South China platform along the Red River Fault resulted in the opening of the South China Sea (Achache et al., 1983).
5. Yucatan is attached to the northern margin of Gondwana (Venezuela).

These maps represent the plate tectonic model presented in the plate tectonic program for the Macintosh® program **TERRA MOBILIS™**.

Table A. Times of Reconstructions

Map # Ma Stratigraphic Age Magnetic Anomaly Number

Cenozoic			
0.	0 *	Present-day	1
1.	1.9 *	Pleistocene	2
2.	4.8	early Pliocene	3
3.	10.6	late Miocene (Sarmatian)	5
4.	14.0*	middle Miocene (Vindobonian)	
5.	20.5	early Miocene (Girondian)	6
6.	27.7*	late Oligocene (Chatian)	8
7.	35.9	earliest Oligocene (Rupelian)	13
8.	42.7	late Eocene (Bartonian)	18
9.	50.3*	middle Eocene (Lutetian)	21
10.	56.1	early Eocene (Ypresian)	24
11.	59.2*	late Paleocene (Thanetian)	25
12.	65.1	early Paleocene (Danian)	28

Mesozoic			
Cretaceous			
13.	69.4*	Maestrichtian	31
14.	80.2	Campanian	33
15.	84.0	Santonian	34
16.	88.0*	Coniacian	
17.	94.0*	Cenomanian	
18.	118.7*	Aptian	M 0
19.	126.5	late Hauterivian	M 4
20.	130.2*	Valanginian	M 11
21.	143.8	Berriasian	M 17
Jurassic			
22.	152.2*	Tithonian (Volgian)	M 21
23.	160.3	Oxfordian	M 29
24.	166.0*	Callovian	
25.	180.0	Bajocian	
26.	195.0*	Pliensbachian	
Triassic			
27.	216.0*	Norian	
28.	232.0	Landinian	
29.	242.0*	Scythian (Induan)	

Paleozoic

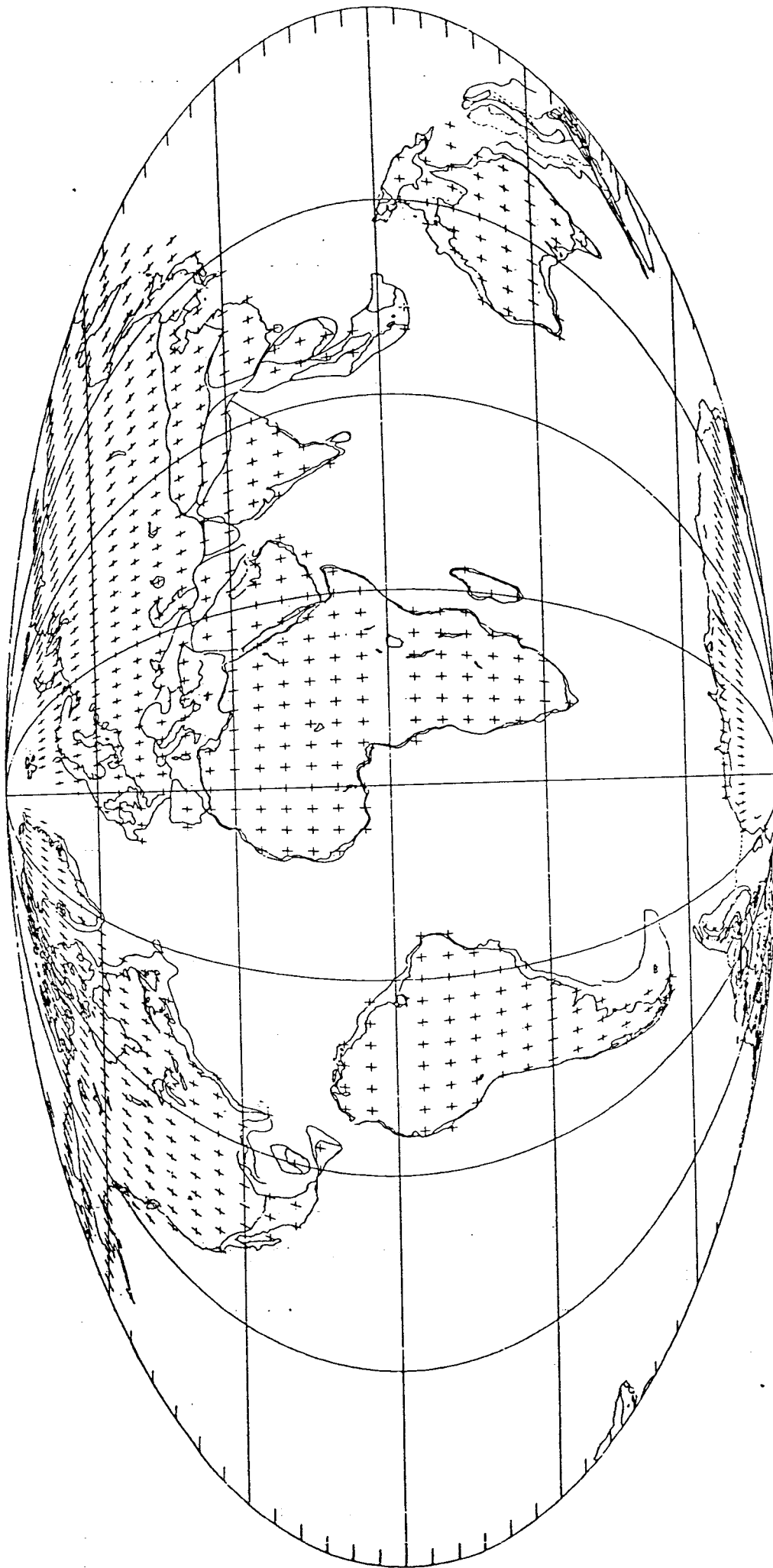
Permian			
30.	255.0	Kazanian	
31.	277.0	Artinskian	
Carboniferous			
32.	291.0	Stephanian	
33.	306.0	Westphalian	
34.	324.0	Namurian	
35.	342.0	Visean	
Devonian			
36.	363.0	Fammenian	
37.	377.0	Givetian	

38.	390.0	Emsian
39.	404.0	Gedinnian
Silurian		
40.	418.0	Ludlovian
41.	425.0	Wenlockian
42.	433.0	Llandoveryian
Ordovician		
43.	443.0	Ashgillian
44.	458.0	Llandeilo-Caradoc
45.	478.0	Arenigian
46.	497.0	Tremadocian
Cambrian		
47.	514.0	Late Cambrian
48.	532.0	Middle Cambrian
49.	555.0	Early Cambrian

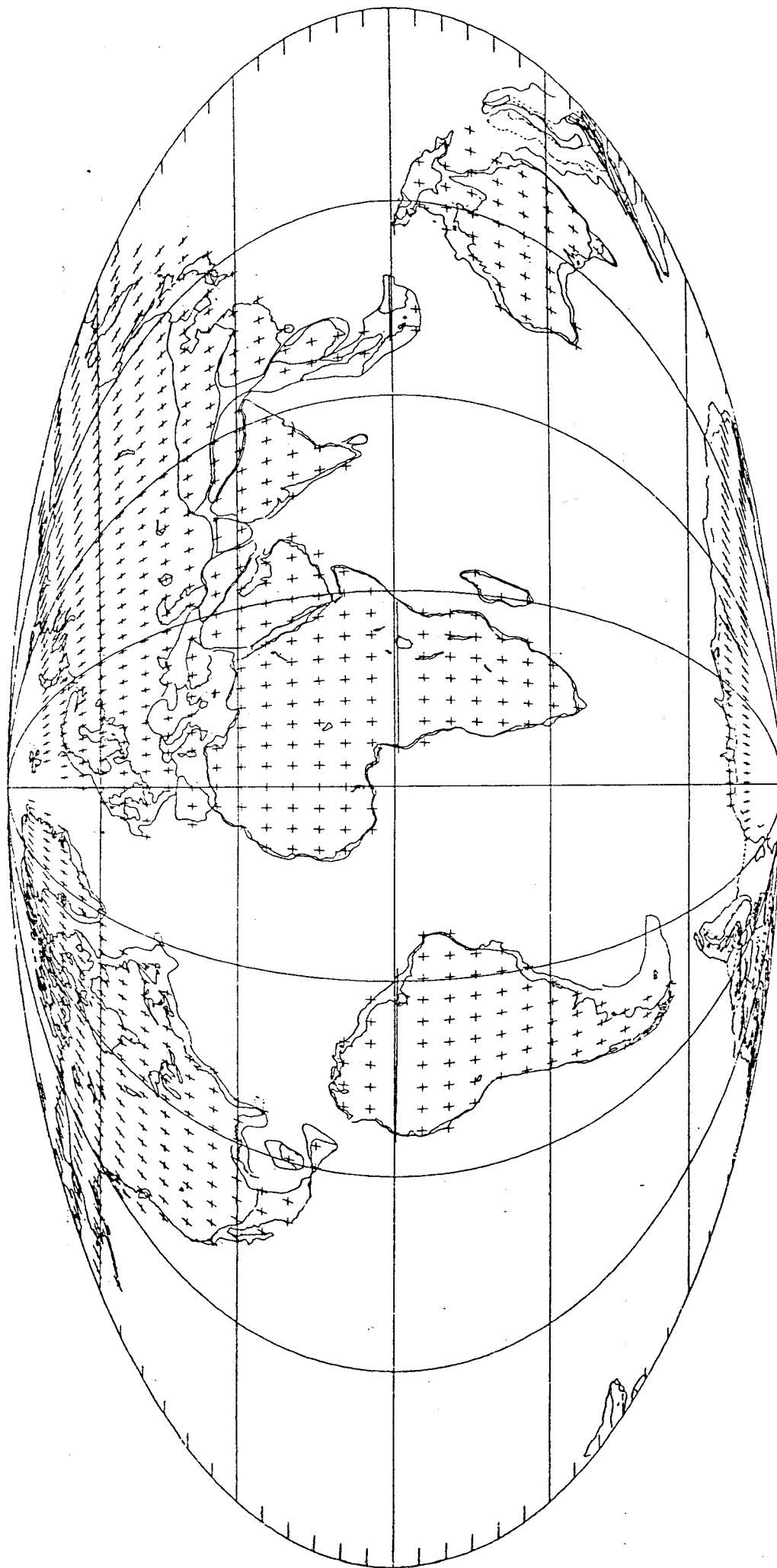
Precambrian

50.	600.0	Tommotian
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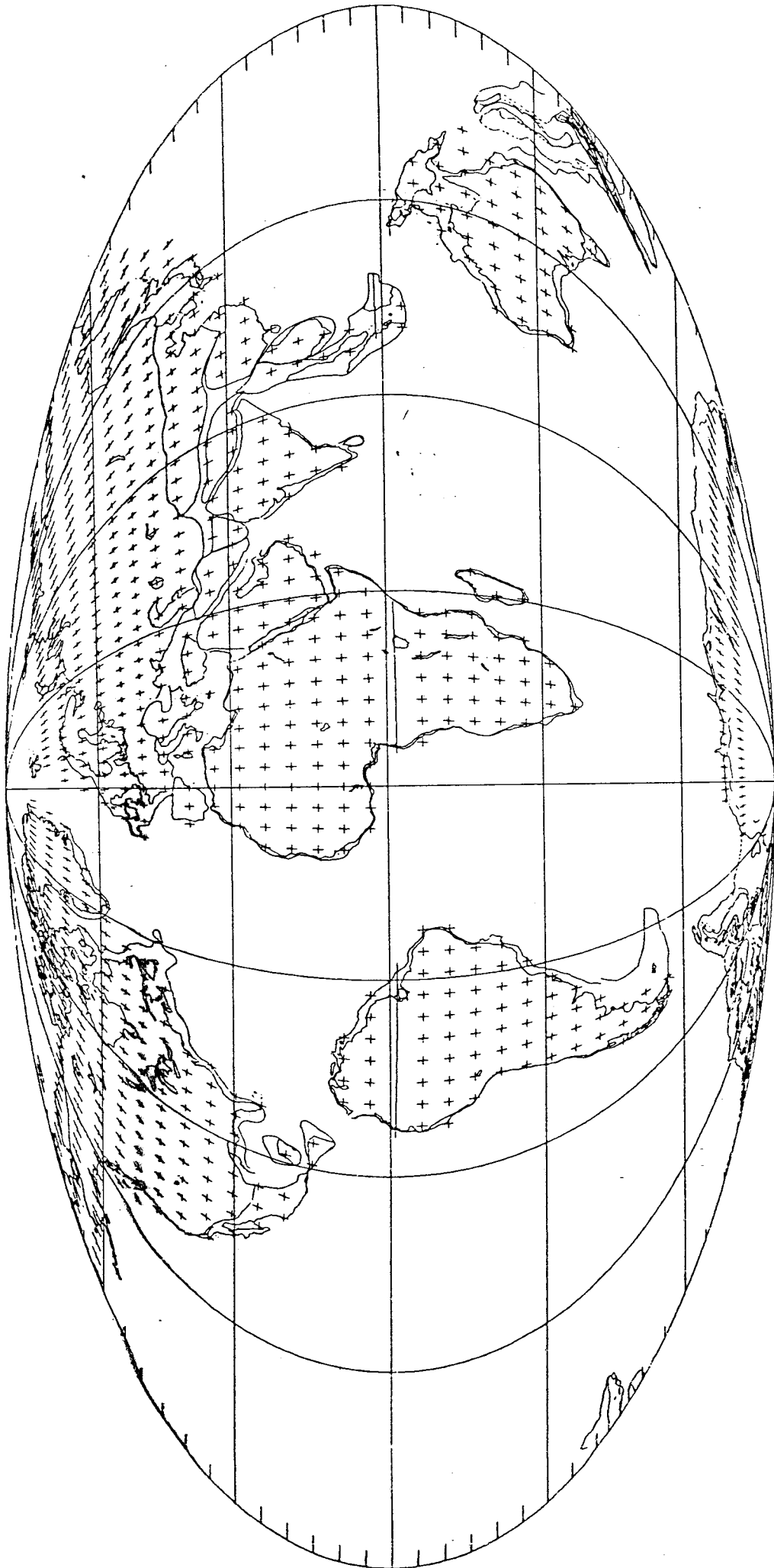
All dates are according to the Decade of North American Geology timescale (Palmer, 1983). Asterisks (*) indicate stages for which there is University of Chicago lithologic data.



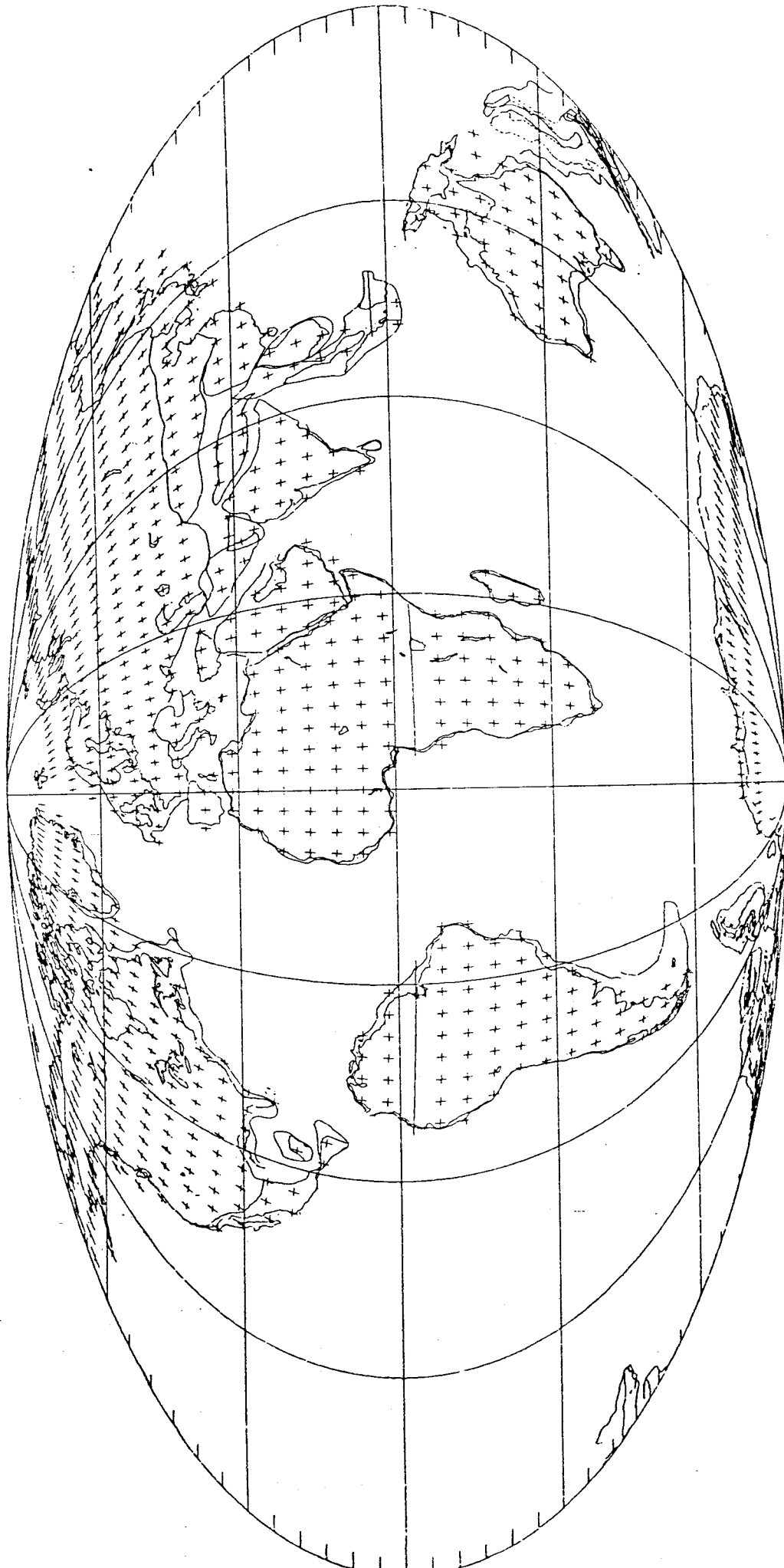
Present-day



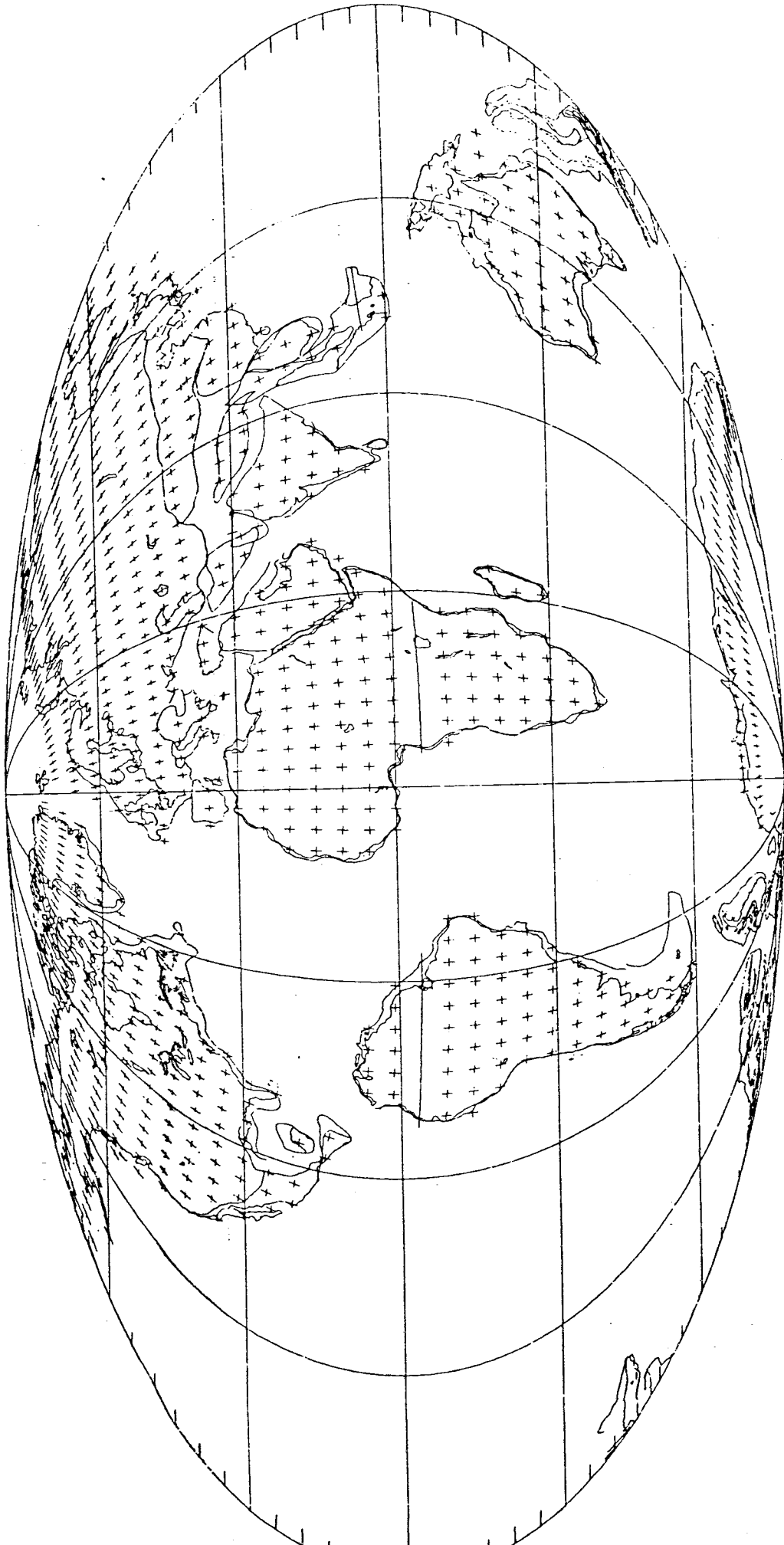
Pleistocene 1.9 Ma (Anomaly 2)



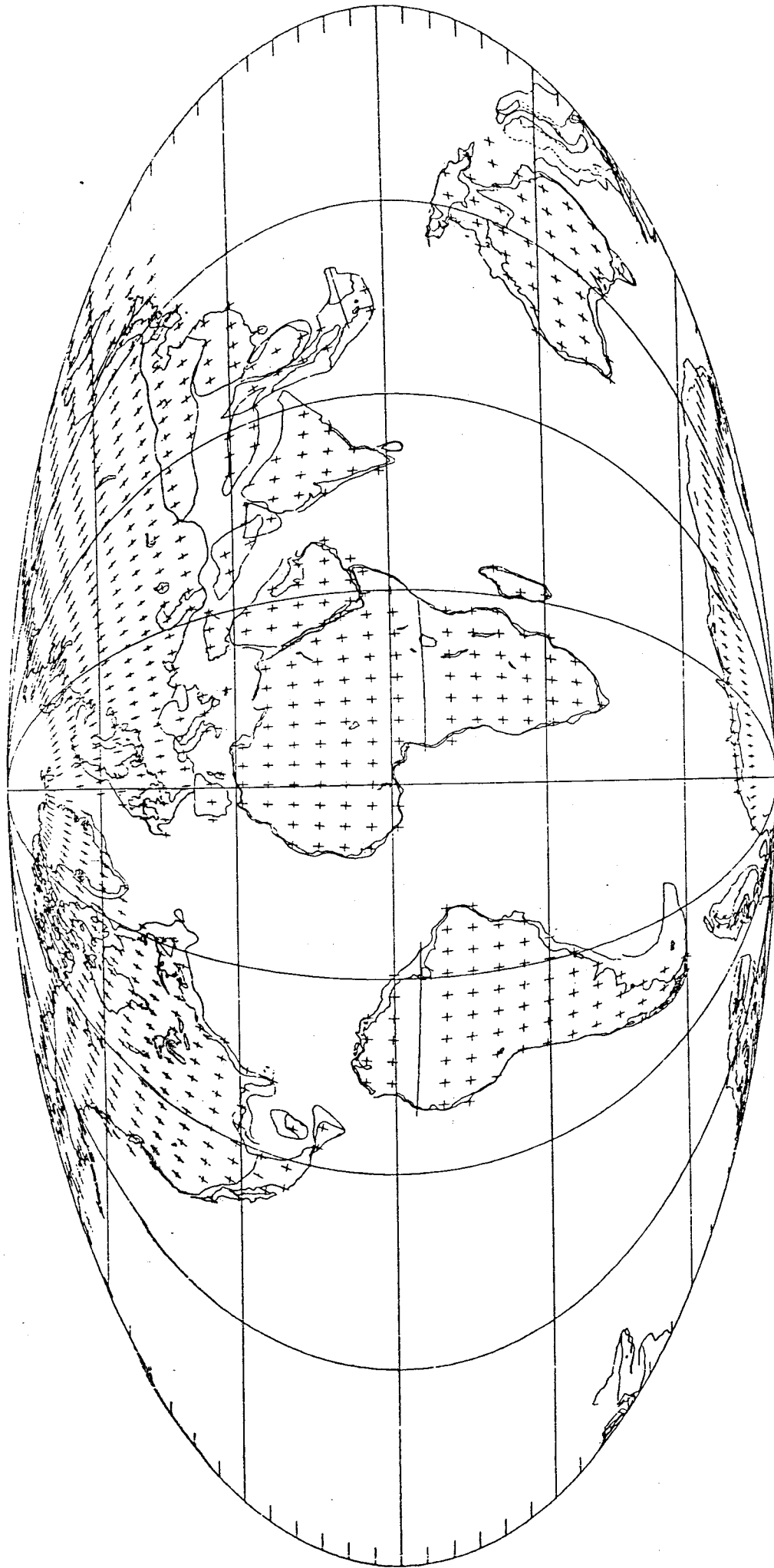
early Pliocene 4.8 Ma (Anomaly 3)



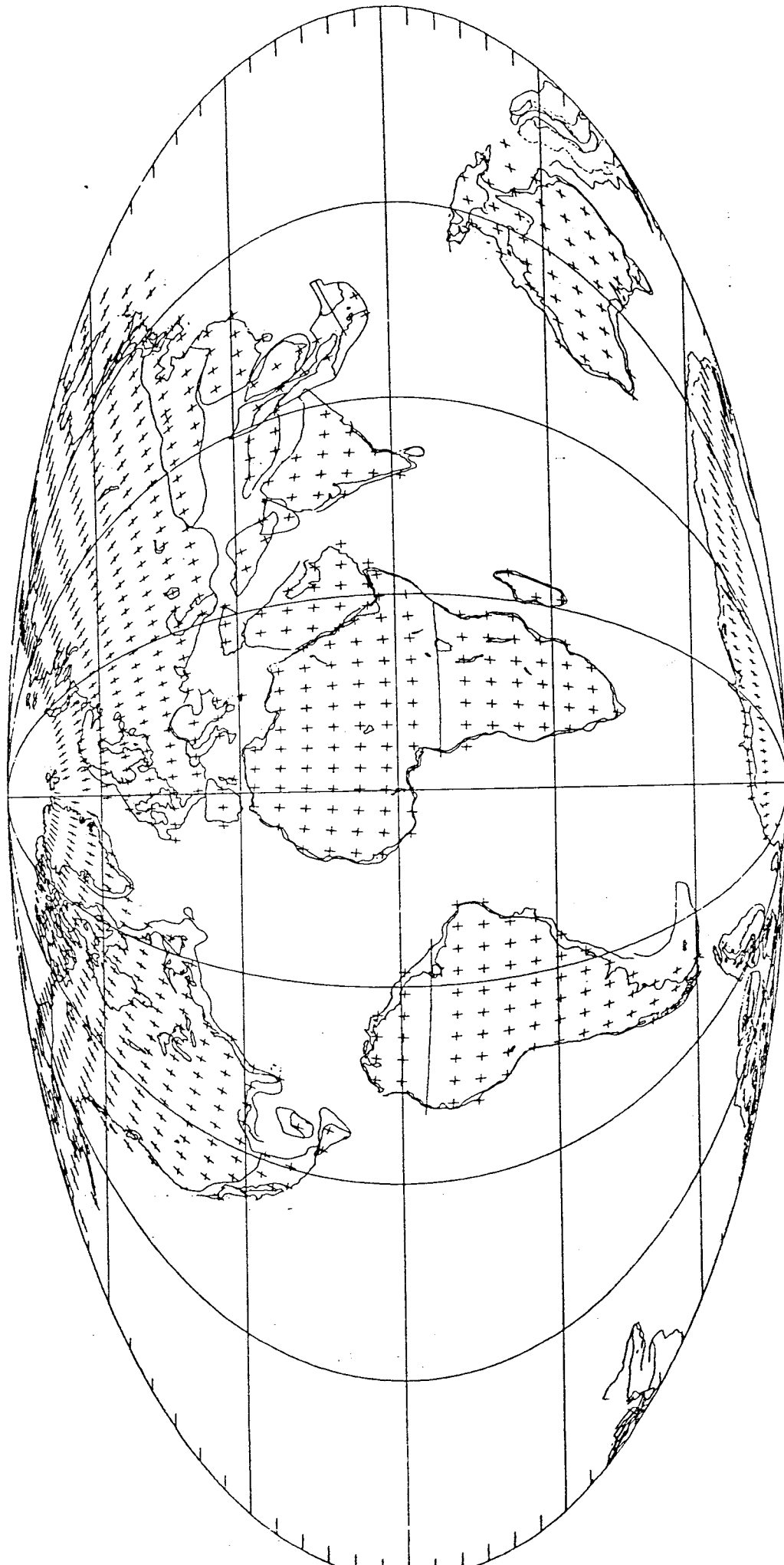
Late Miocene (Sarmatian) 10.6 Ma (Anomaly 5)



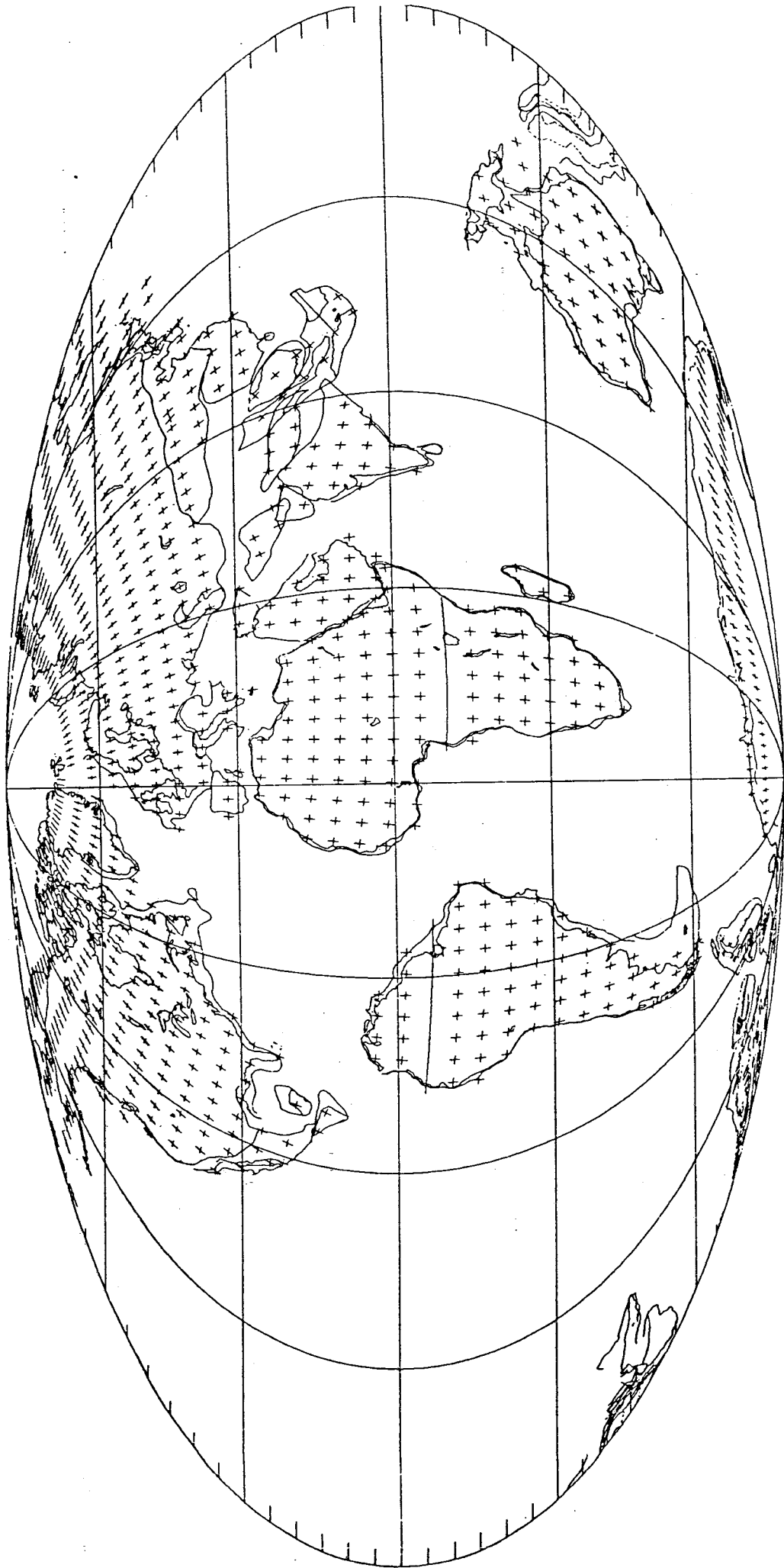
middle Miocene (Vindobonian) 14.0 Ma



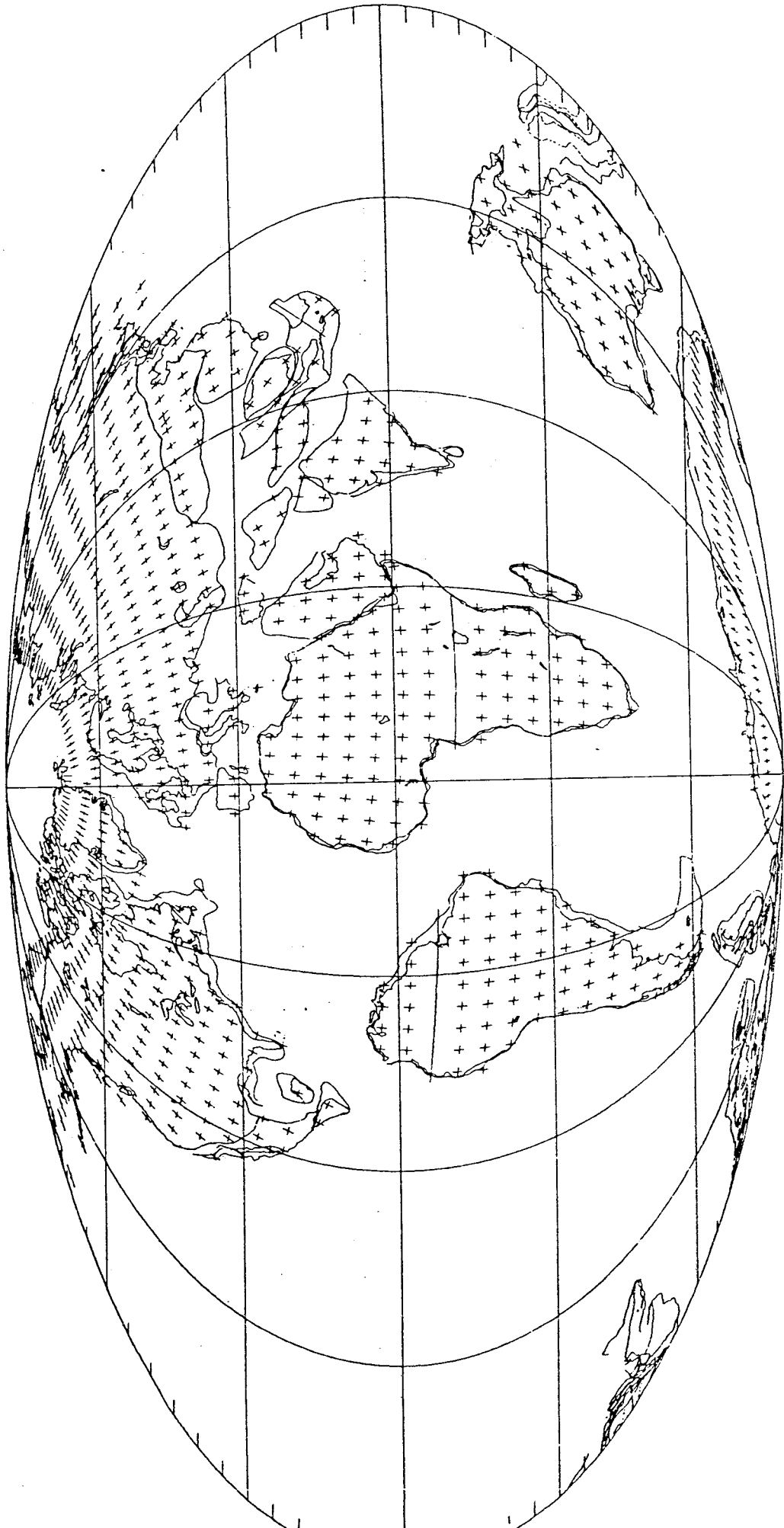
early Miocene (Girondian) 20.5 Ma (Anomaly 6)



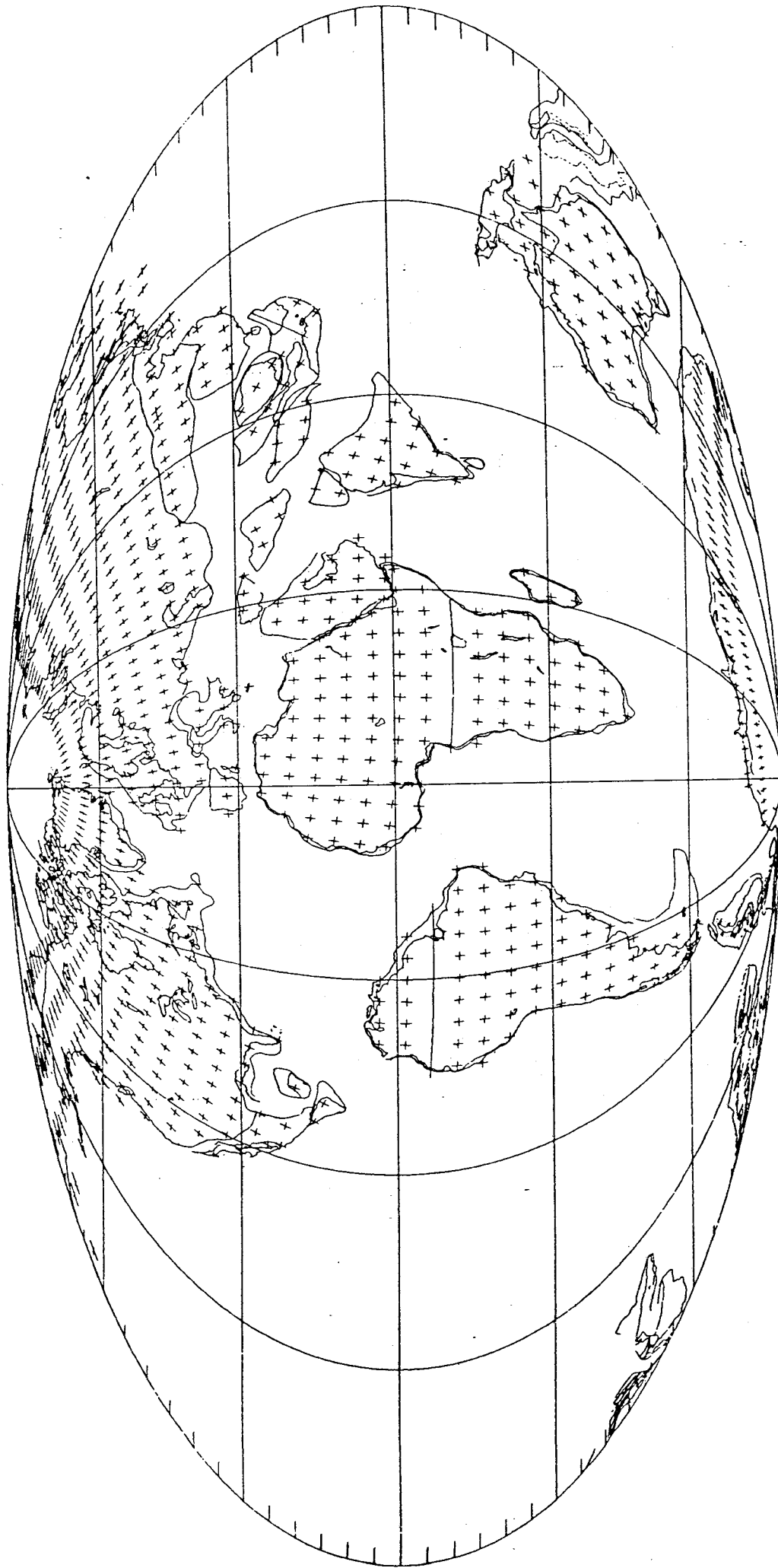
late Oligocene (Chattian) 27.7 Ma (Anomaly 8)



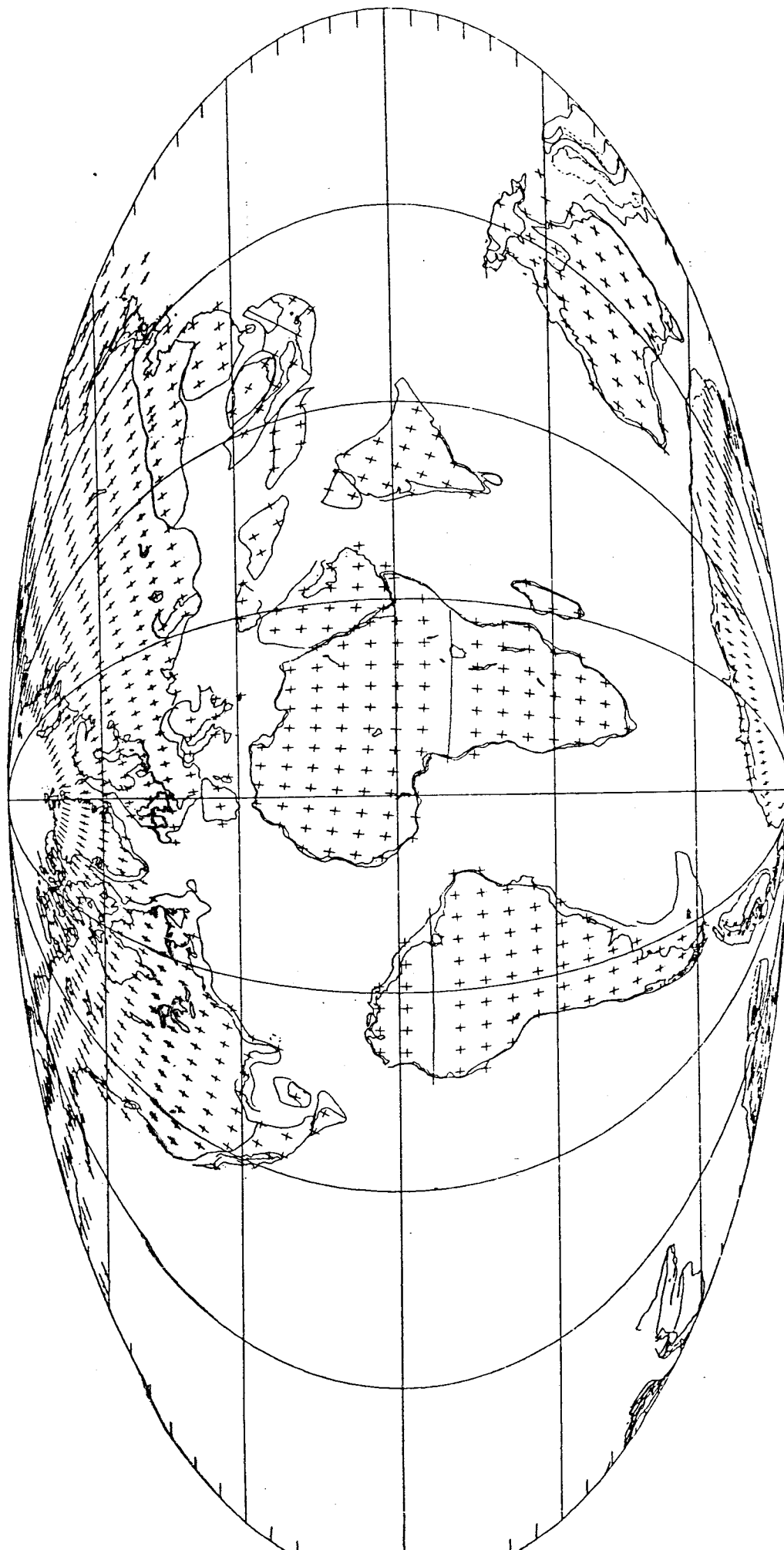
earliest Oligocene (Rupelian) 35.9 Ma (Anomaly 13)



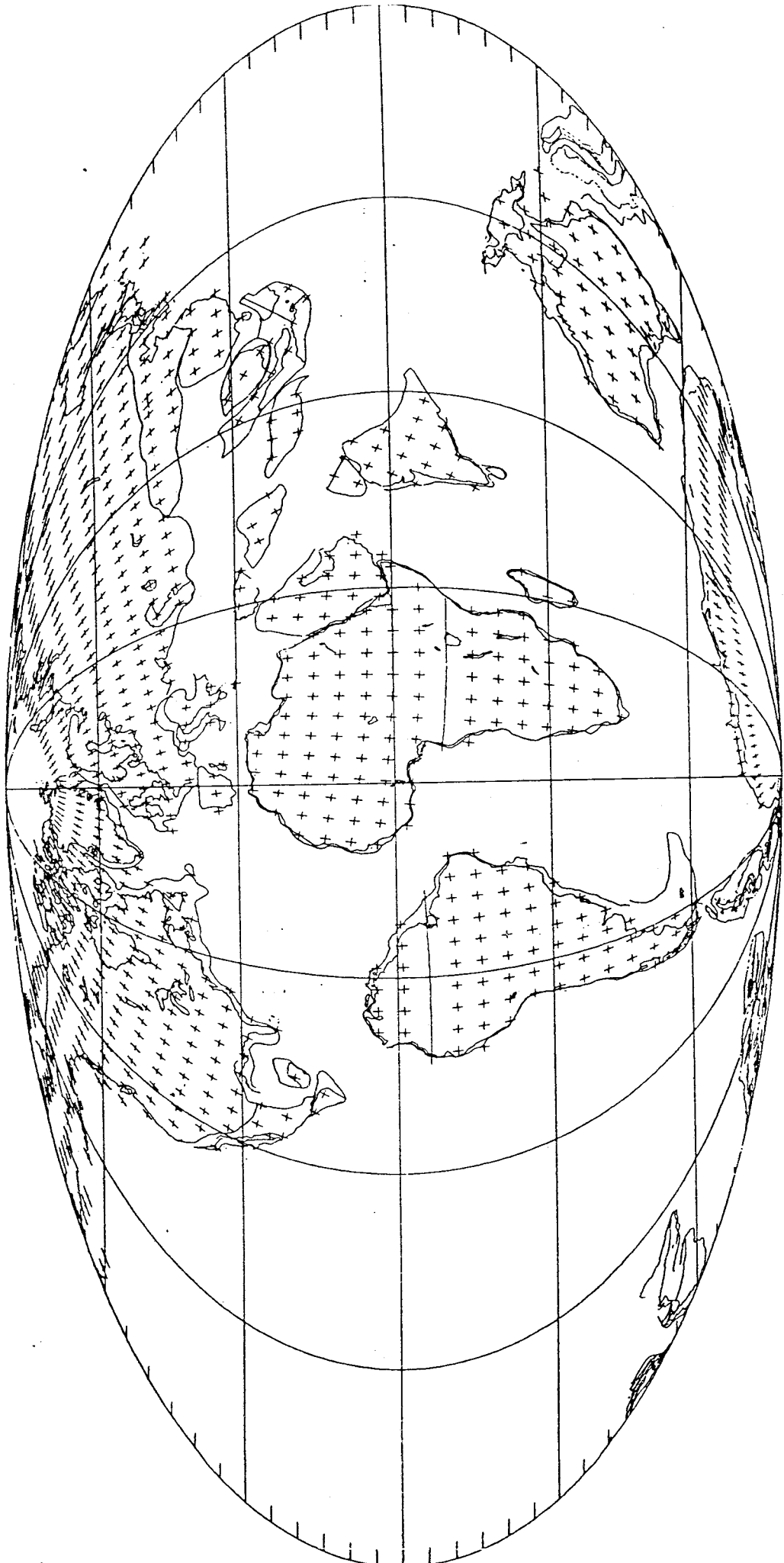
Late Eocene (Bartonian) 42.7 Ma (Anomaly 18)



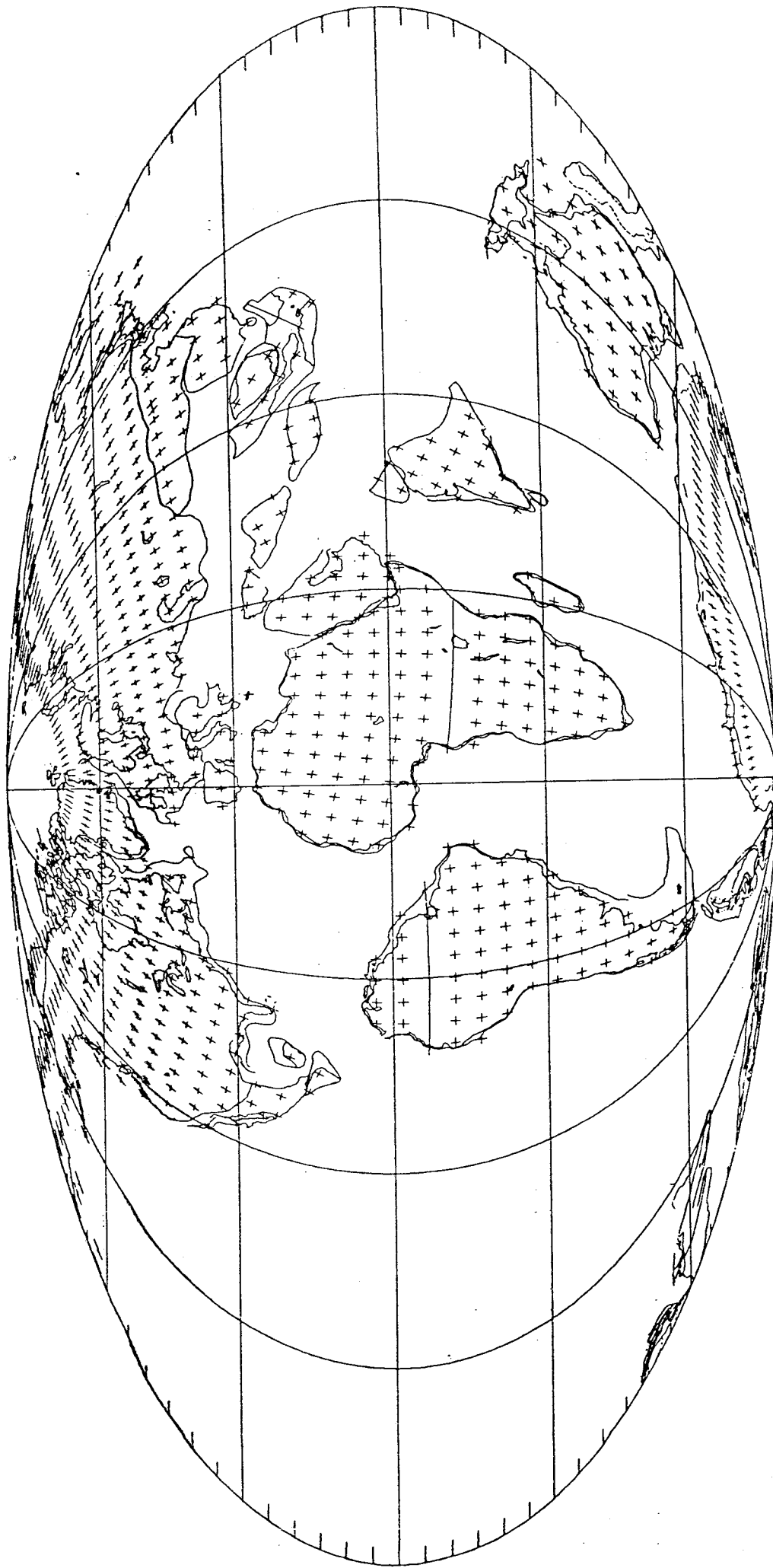
middle Eocene (Lutetian) 50.3 Ma (Anomaly 21)



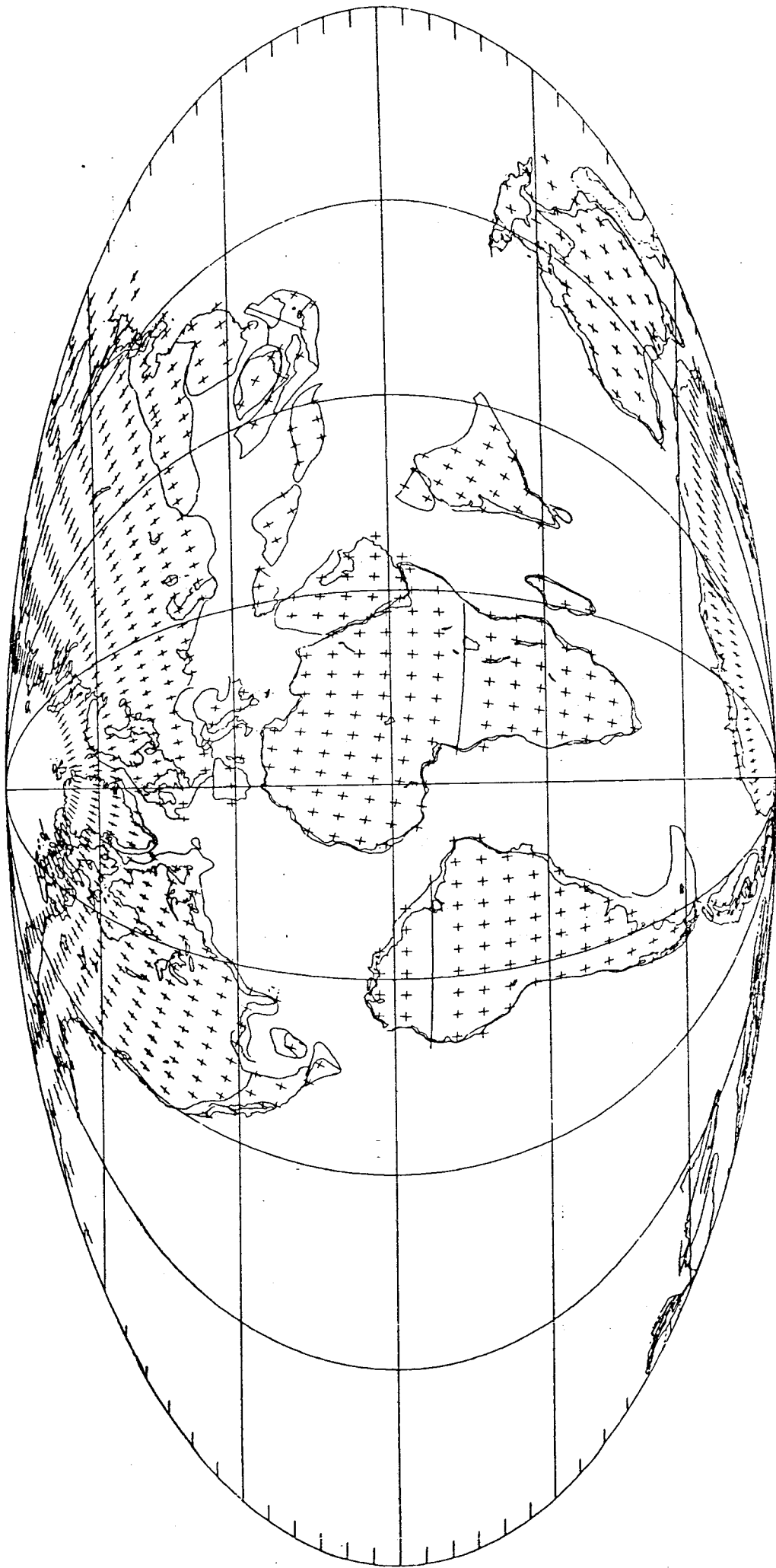
early Eocene (Ypresian) 56.1 Ma (Anomaly 24)



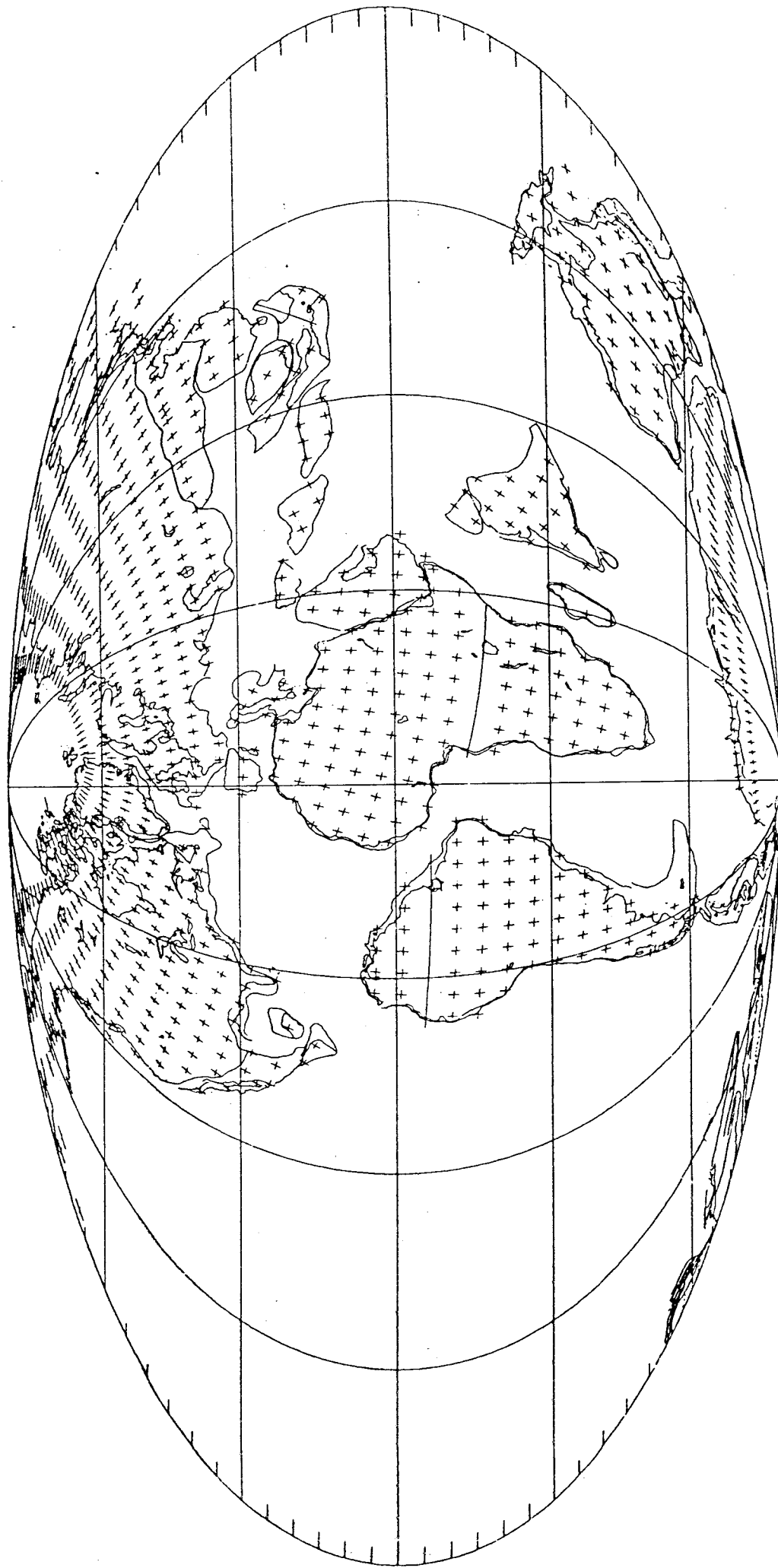
late Paleocene (Thanetian) 59.2 Ma (Anomaly 25)



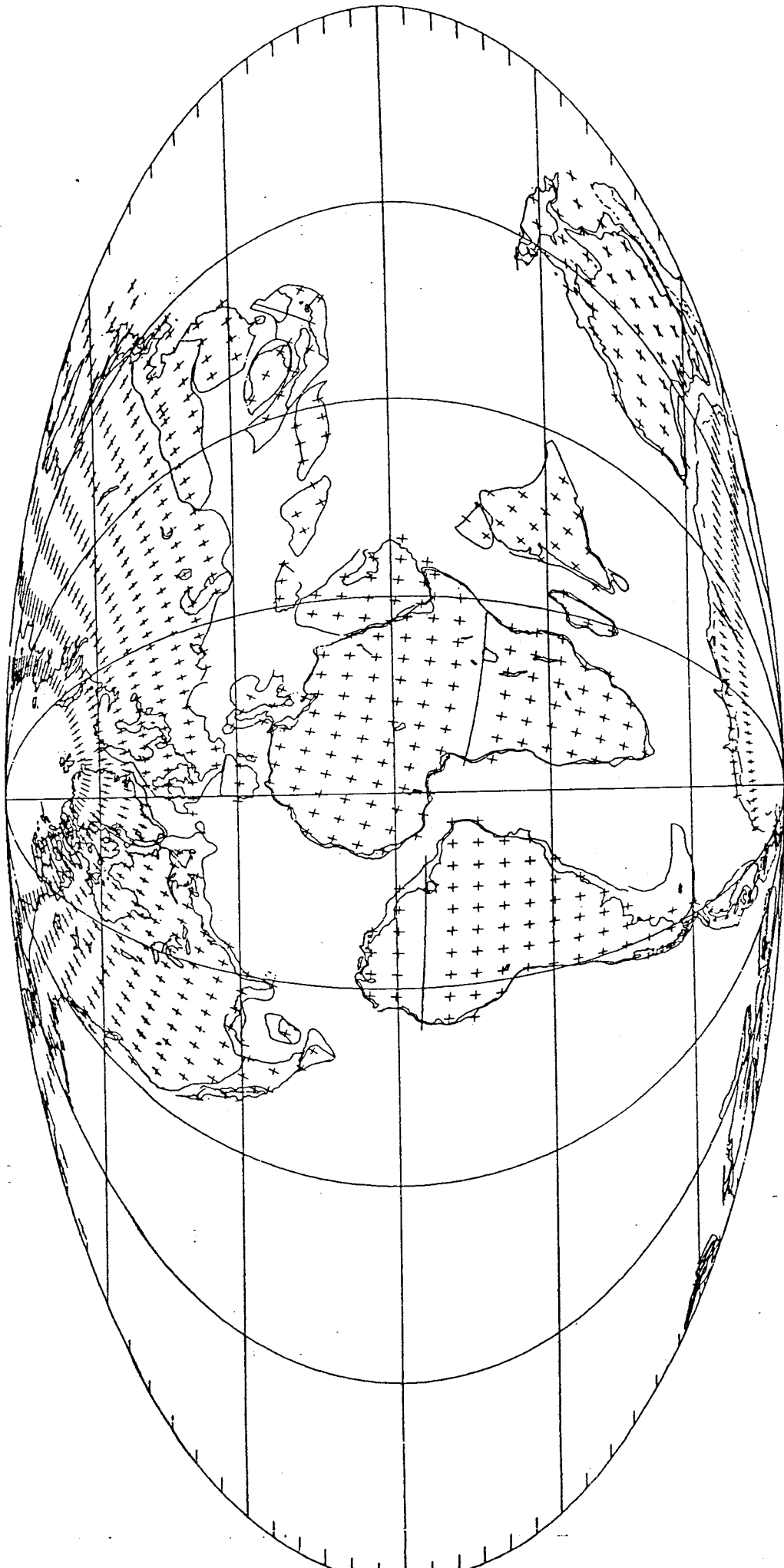
early Paleocene (Danian) 65.1 Ma (Anomaly 28)



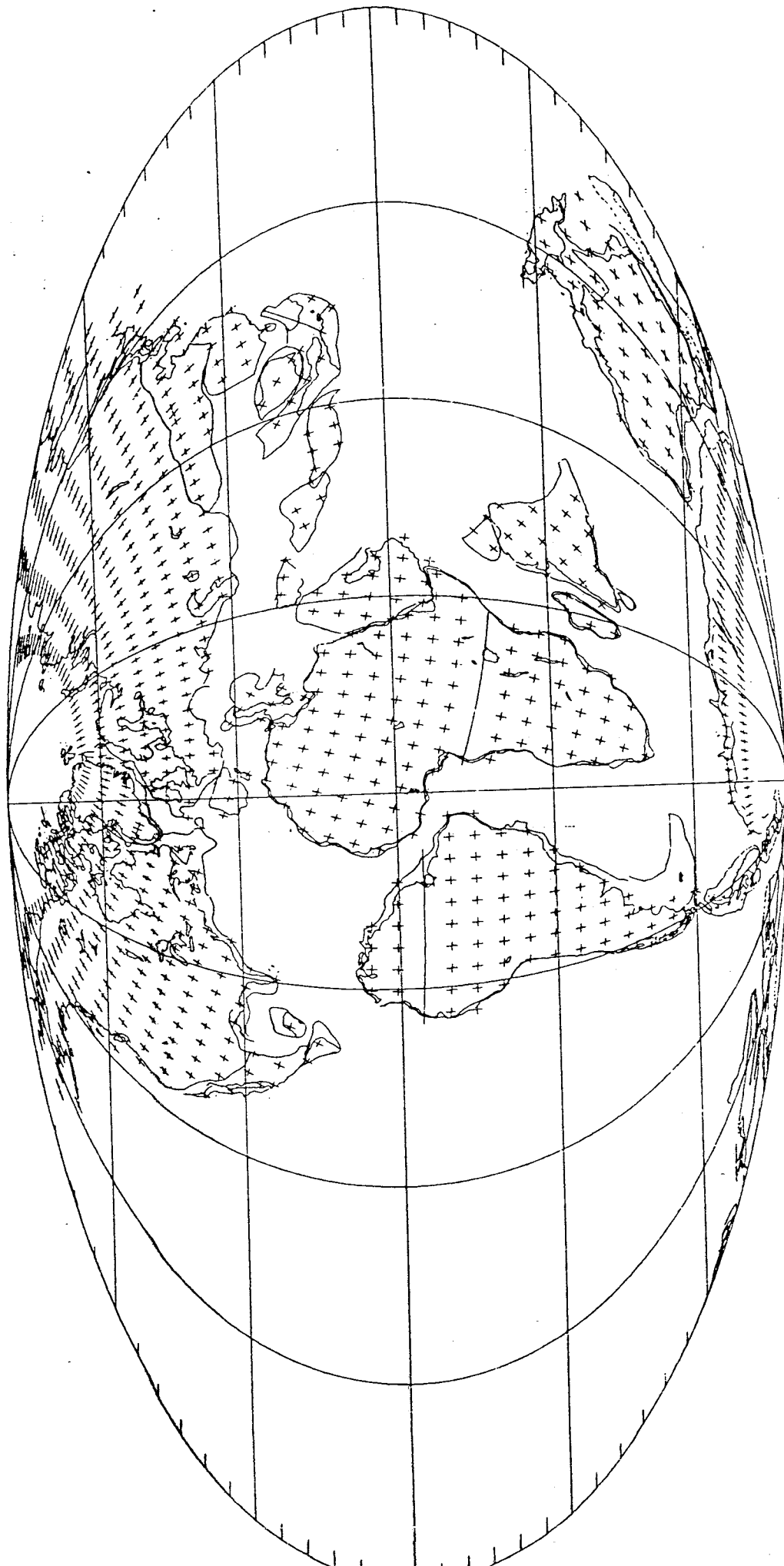
Maestrichtian 69.4 Ma (Anomaly 31)



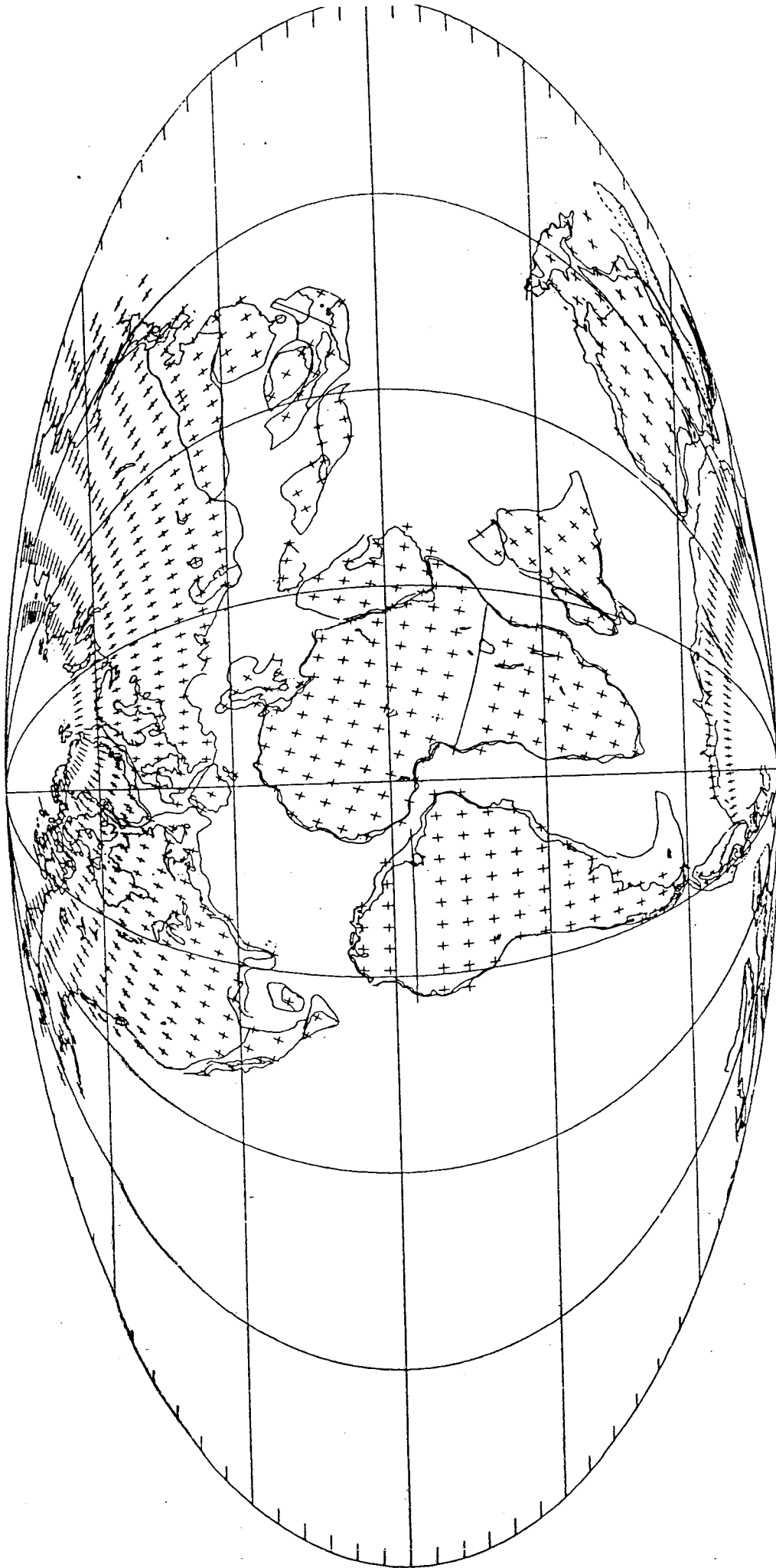
Campanian 80.2 Ma (Anomaly 33)



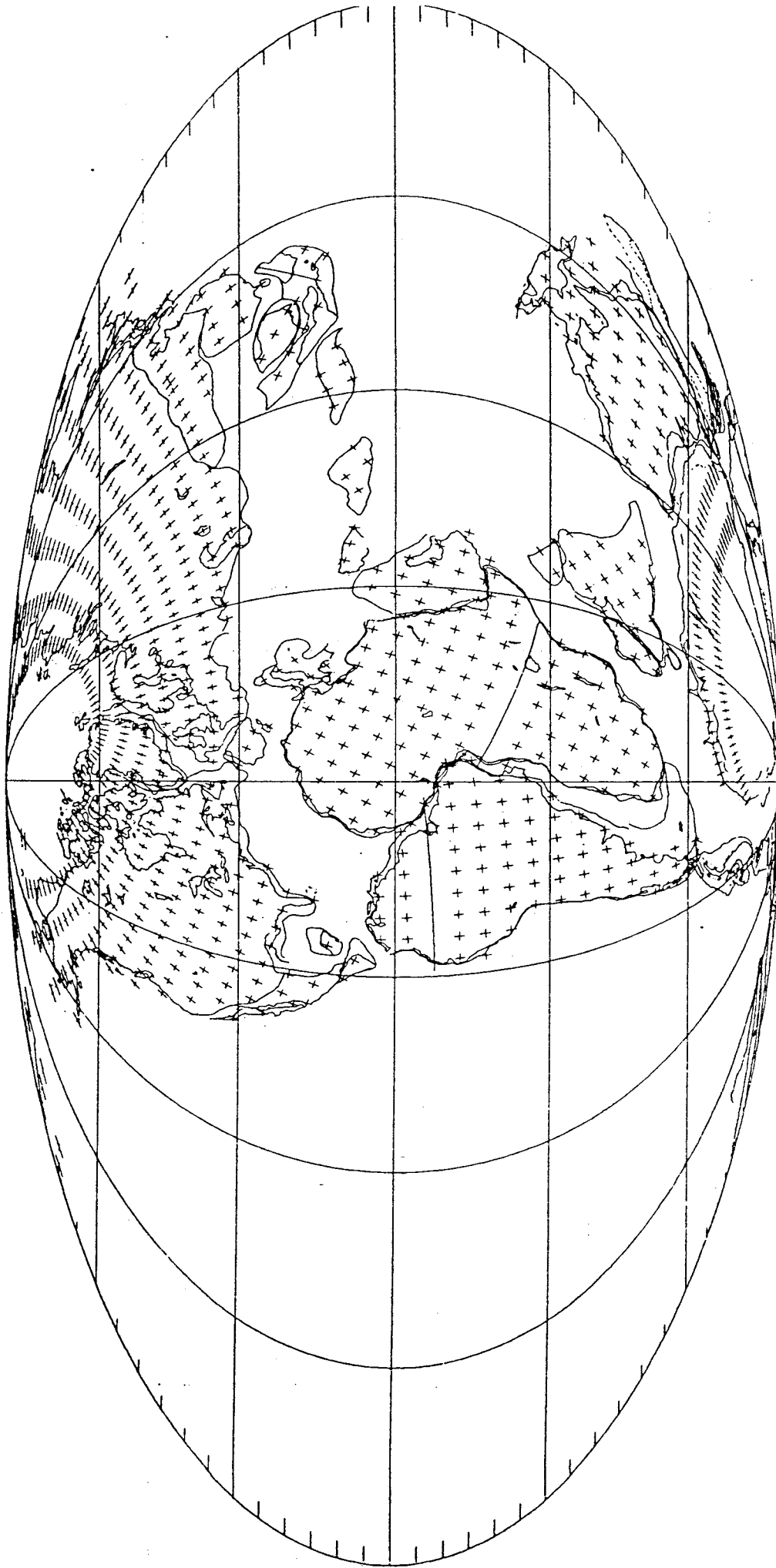
Santonian 84.0 Ma (Anomaly 34)



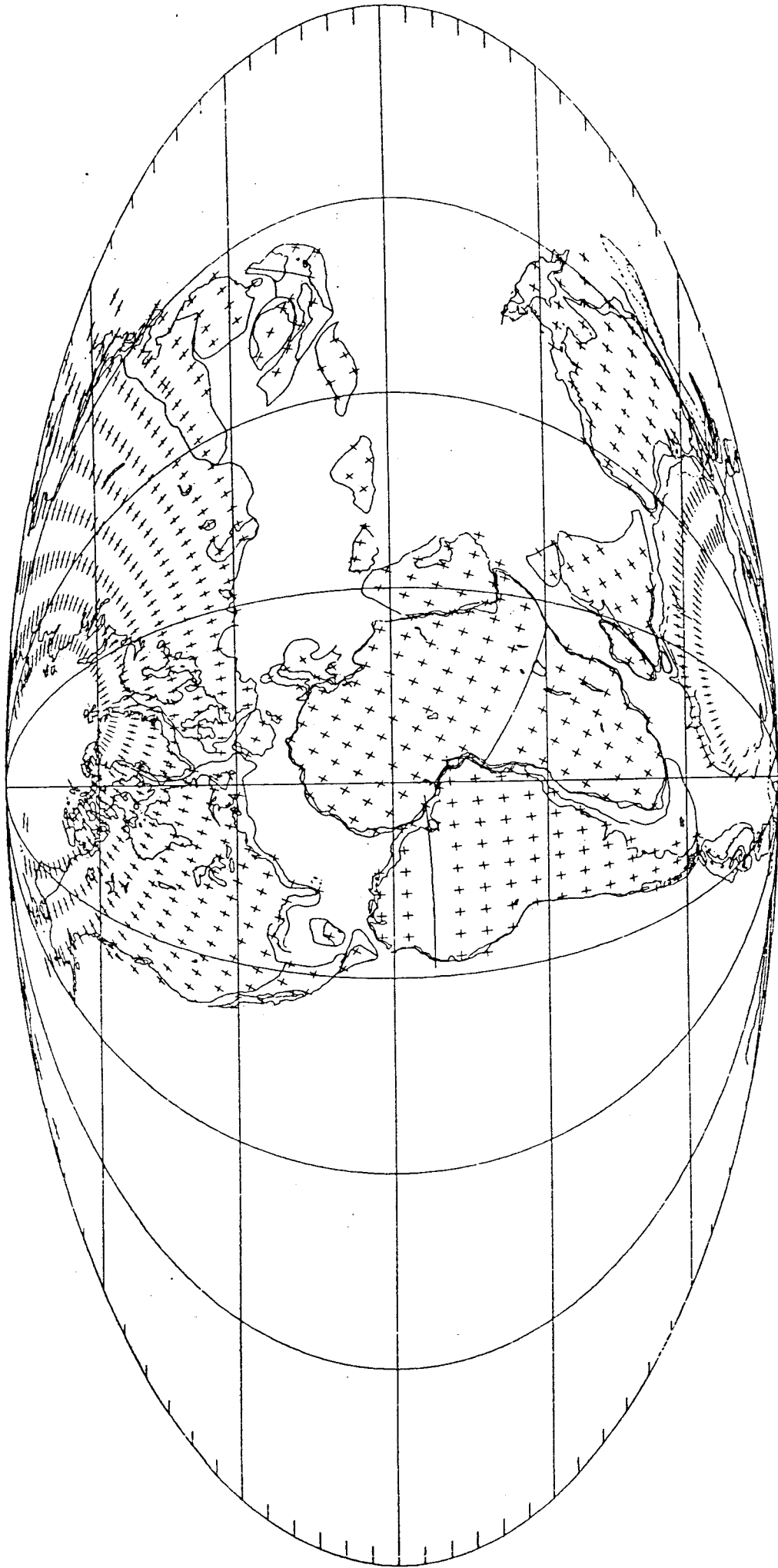
Coniacian 88.0 Ma



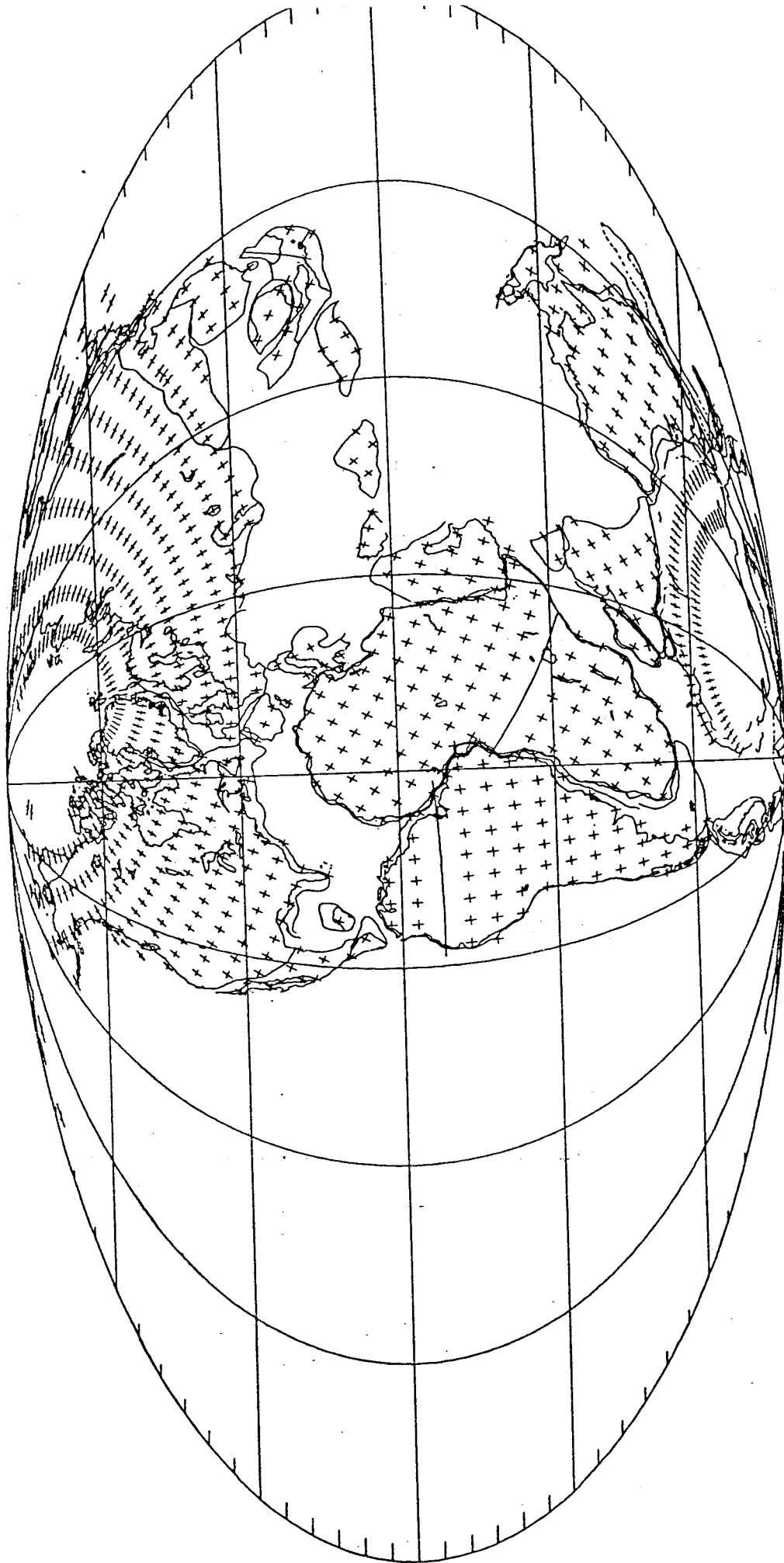
Cenomanian 94.0 Ma



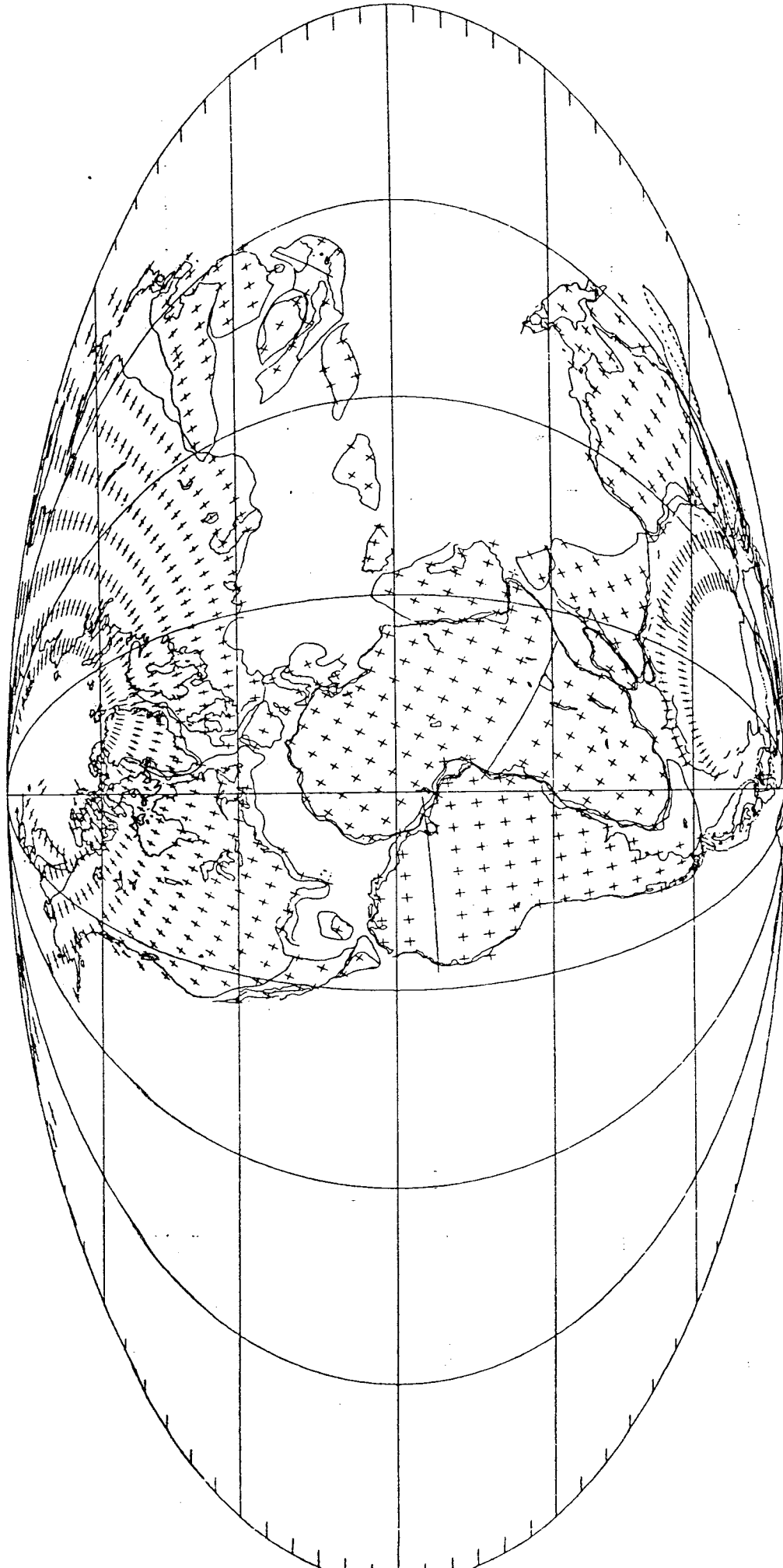
Aptian 118.7 Ma (Anomaly M0)



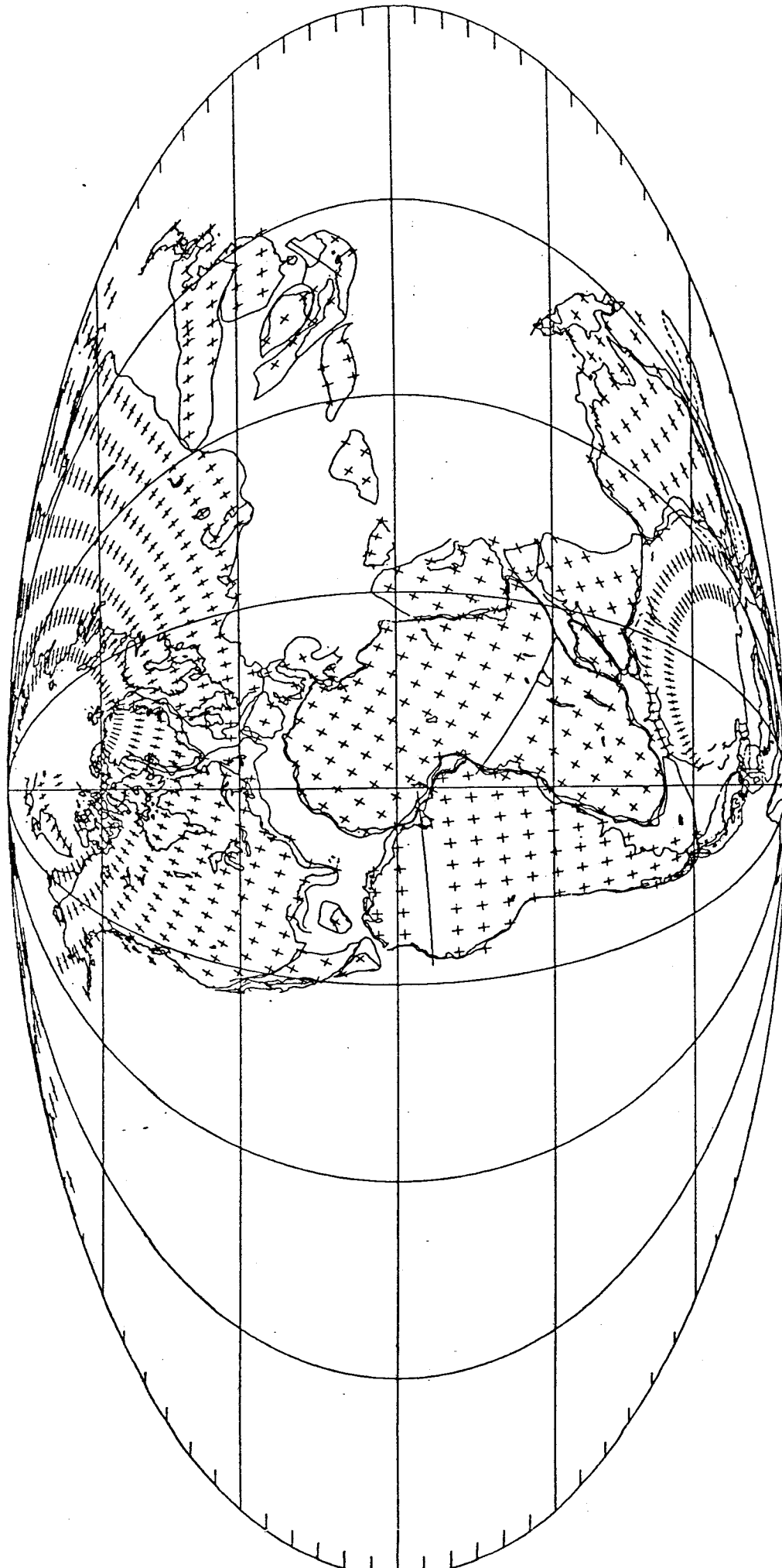
late Hatterian 126.5 Ma (Anomaly M4)



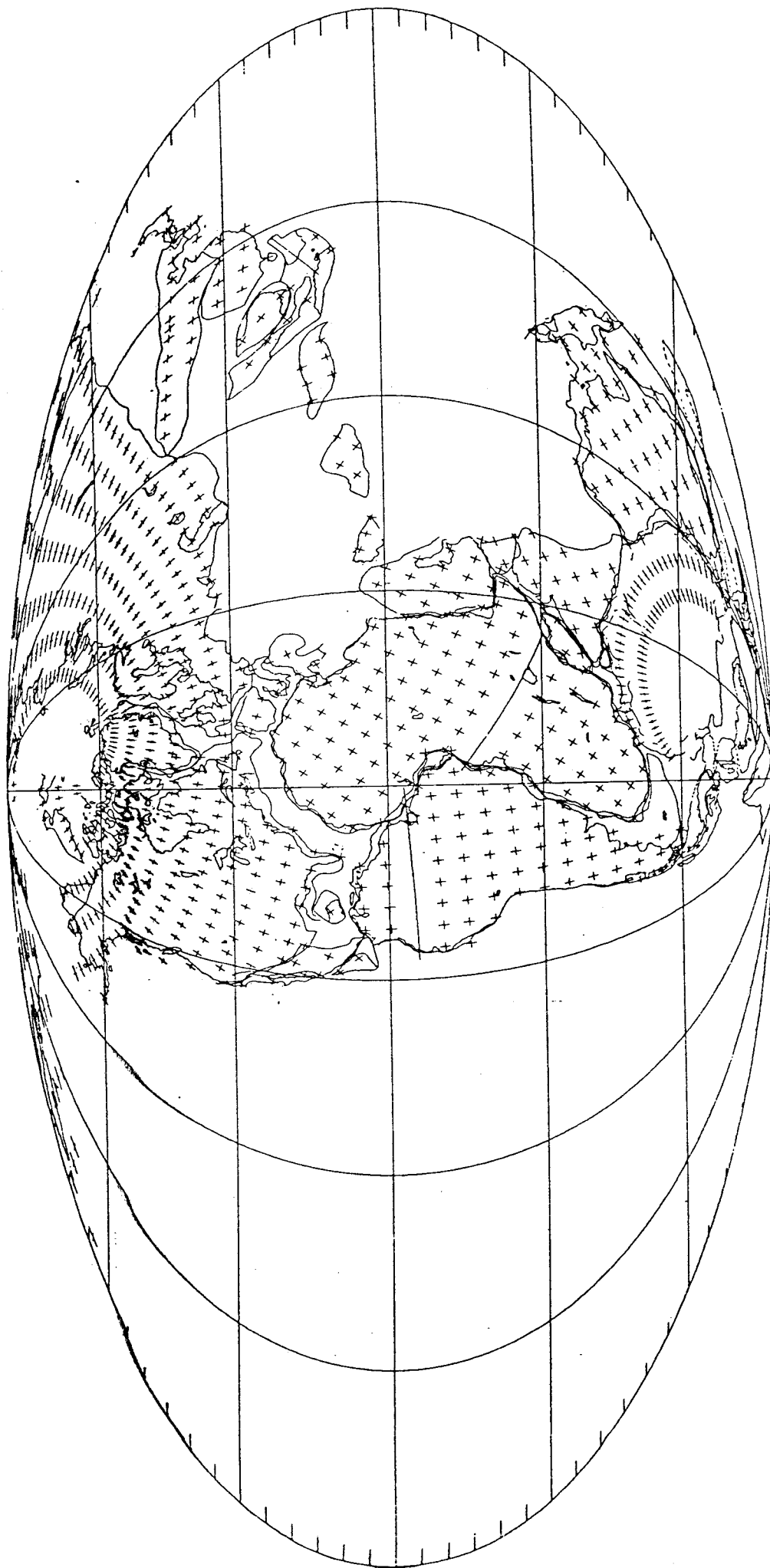
Valanginian 130.2 Ma (Anomaly M11)



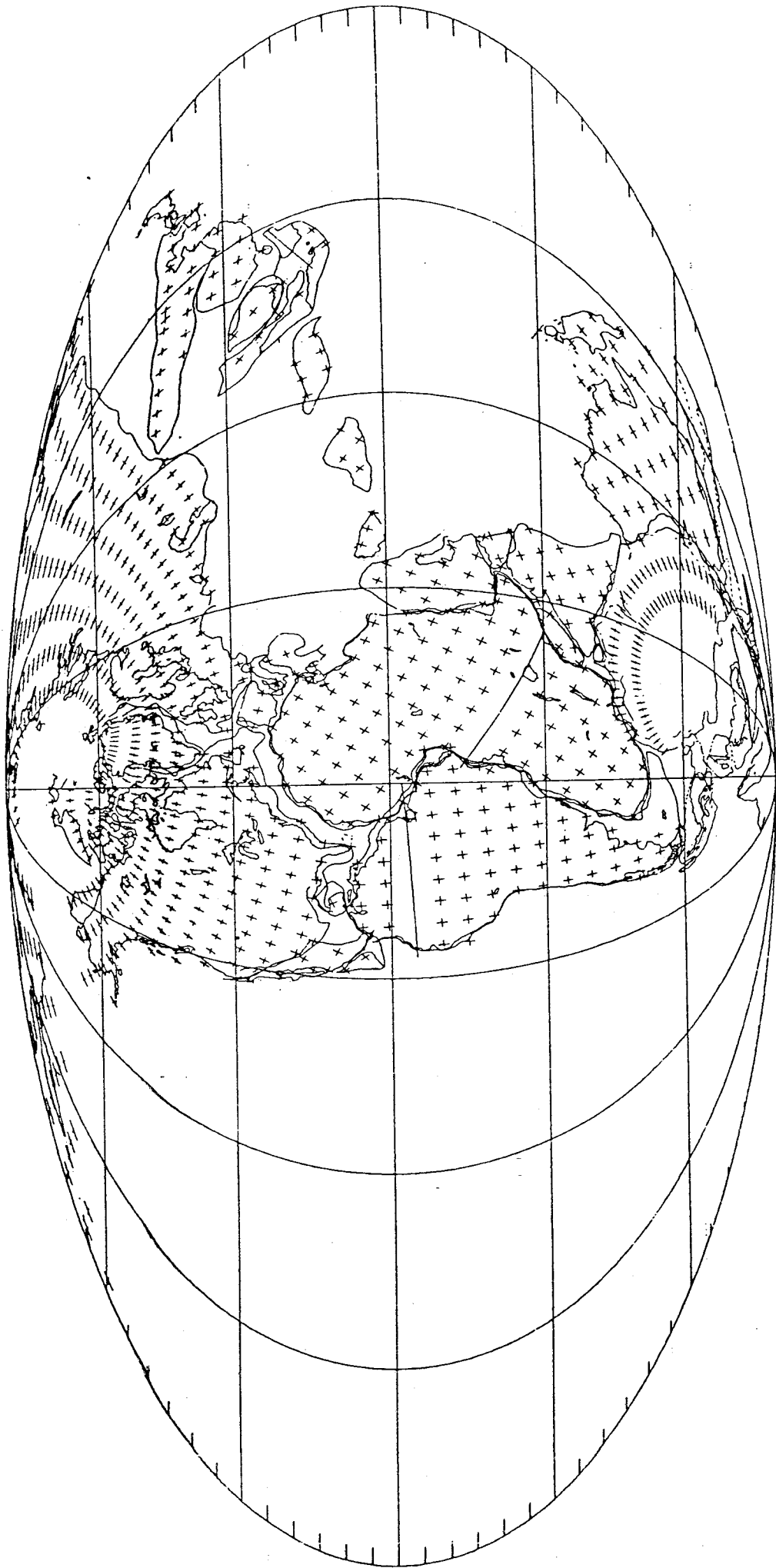
Berriasian 143.8 Ma (Anomaly M17)



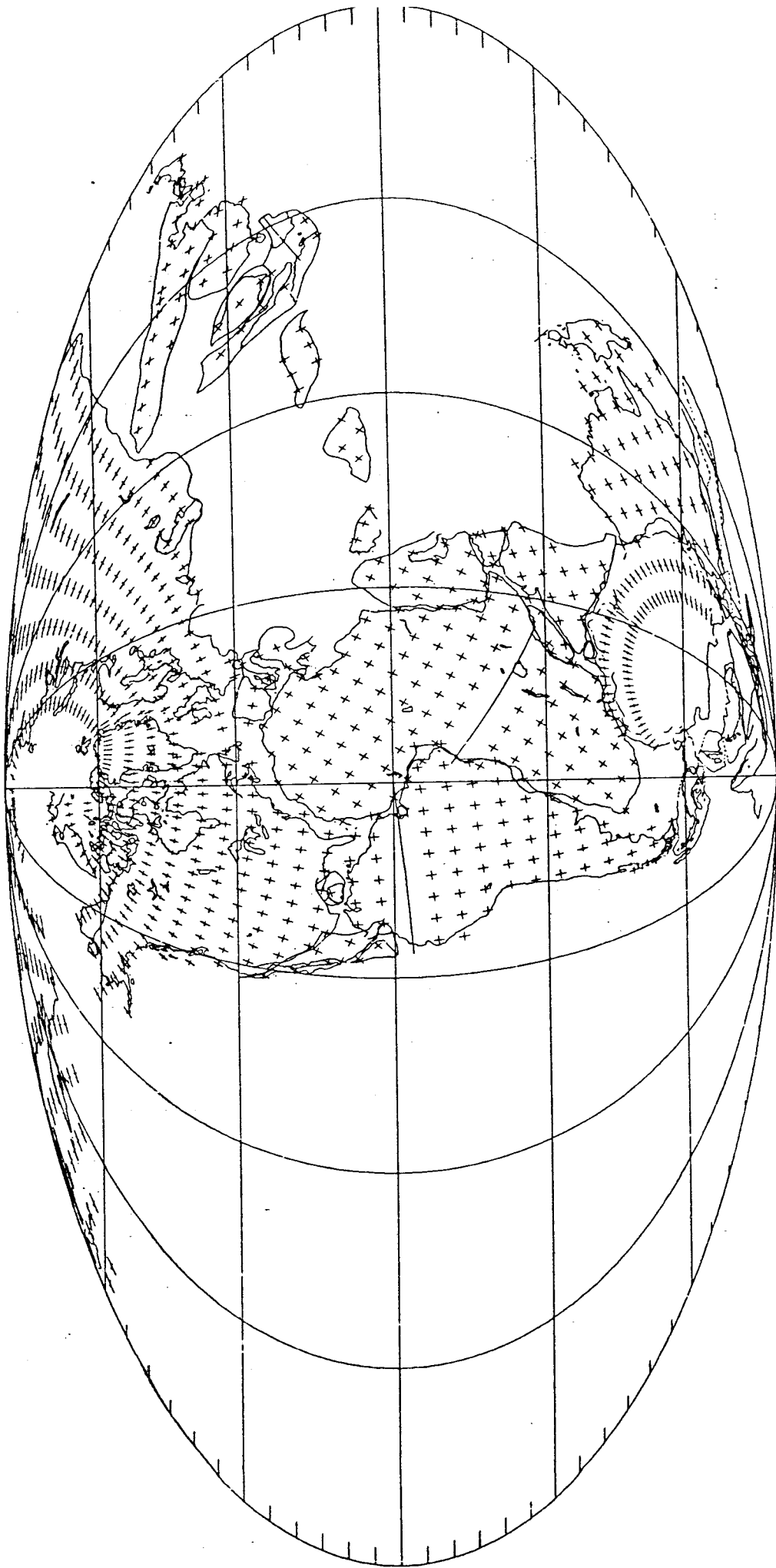
Tithonian (Volgian) 152.2 Ma (Anomaly M21)



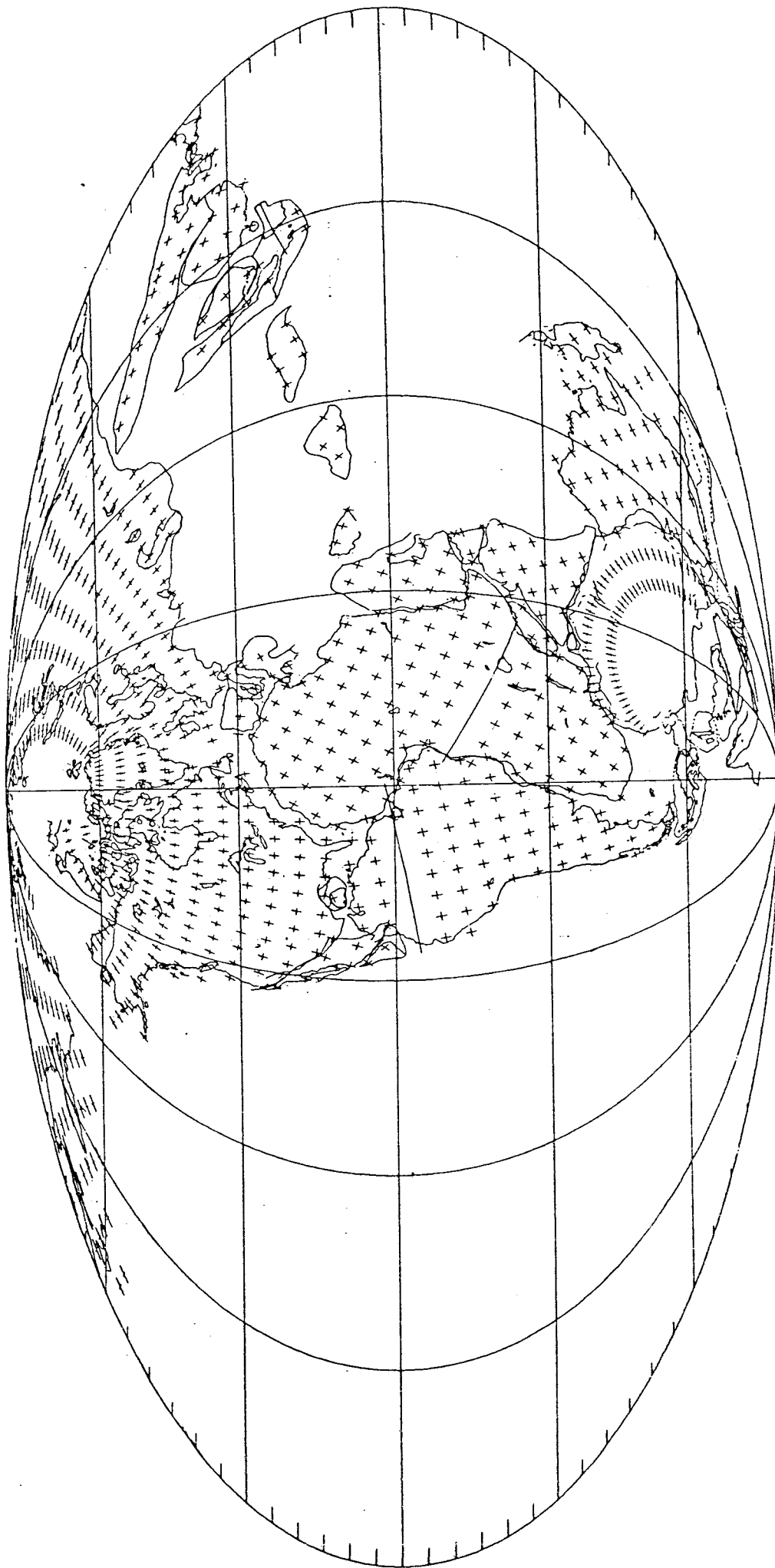
Oxfordian 160.3 Ma (Anomaly M29)



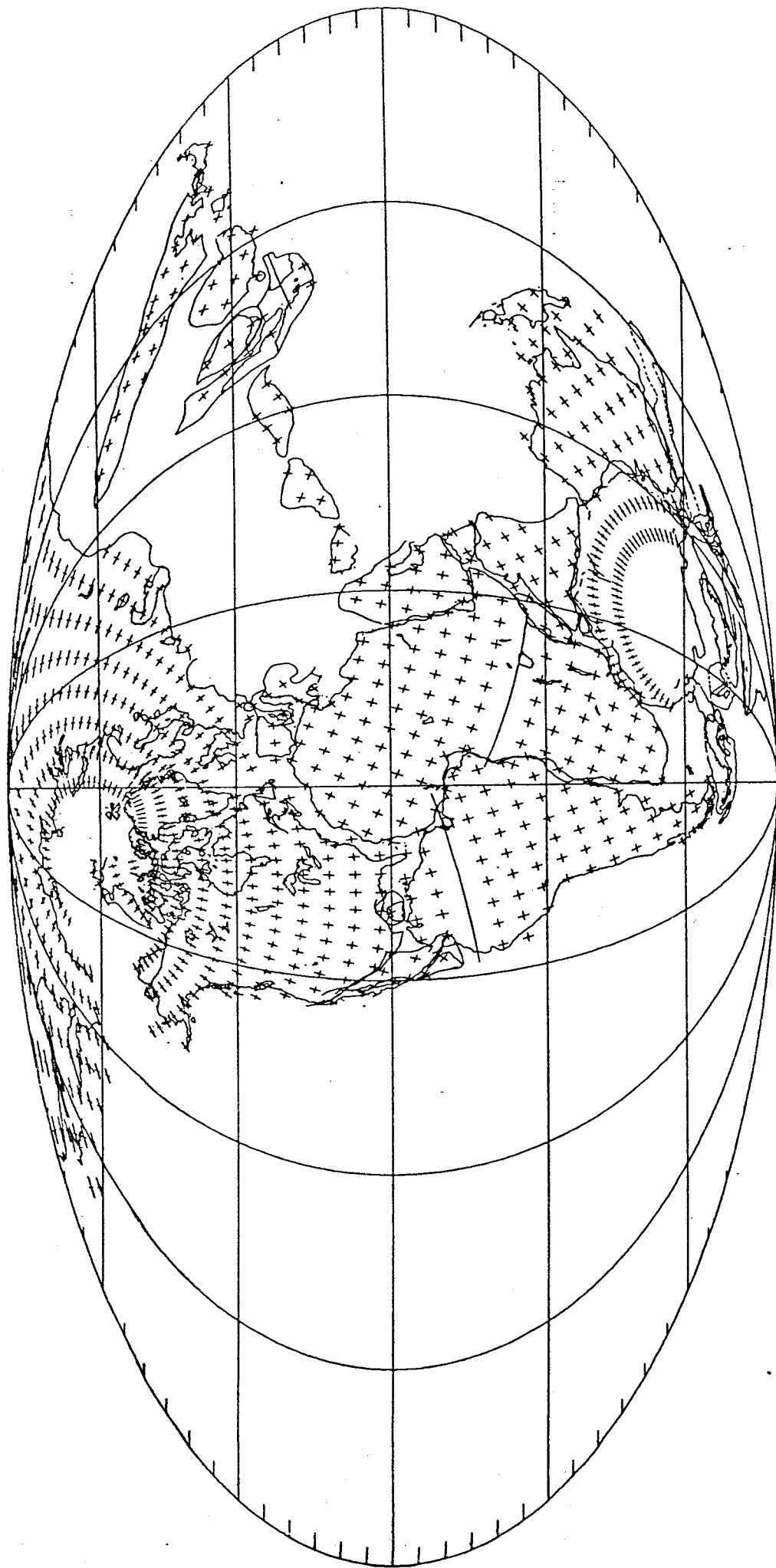
Callovian 166.0 Ma



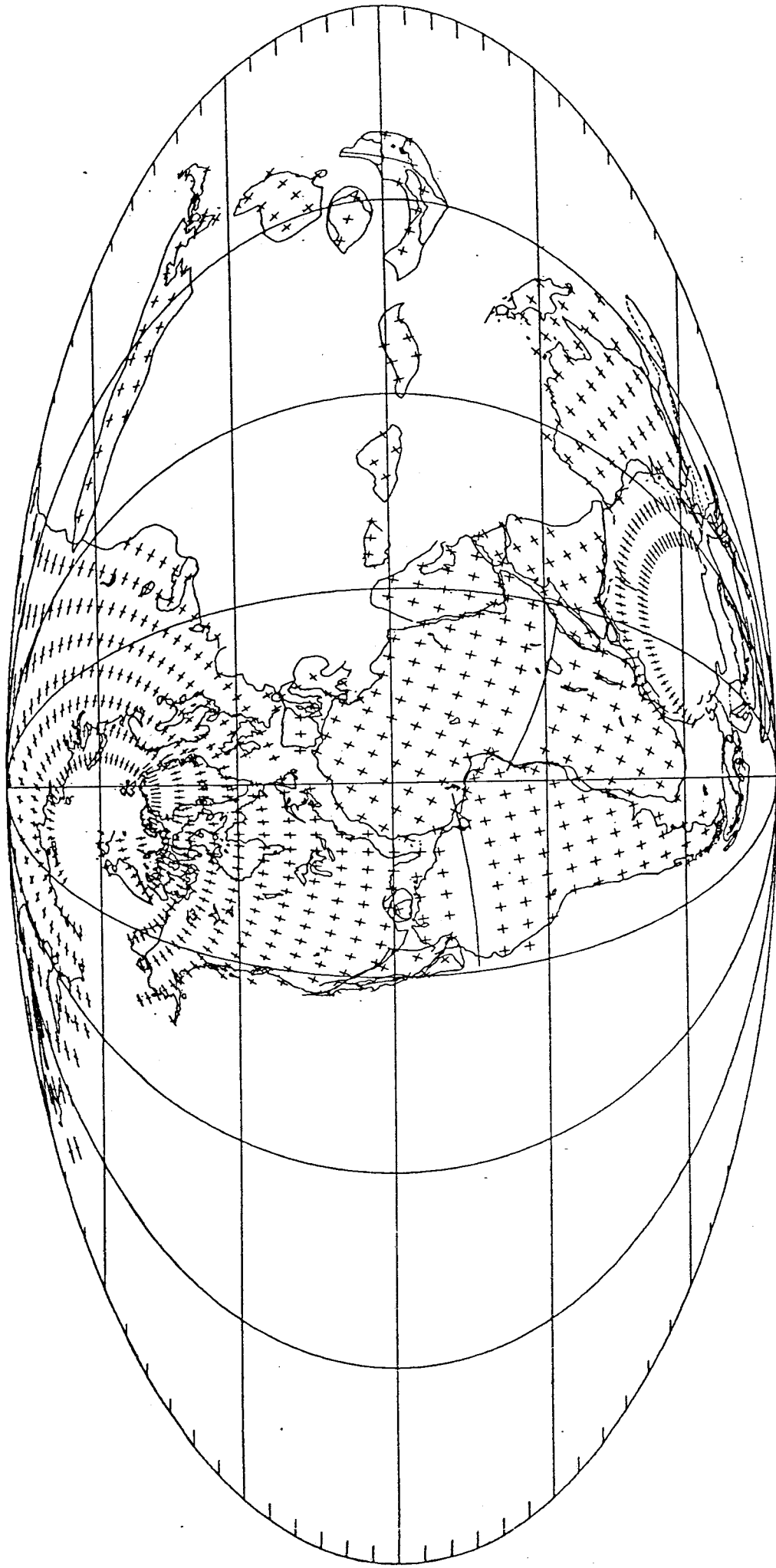
Bajocian 180.0 Ma



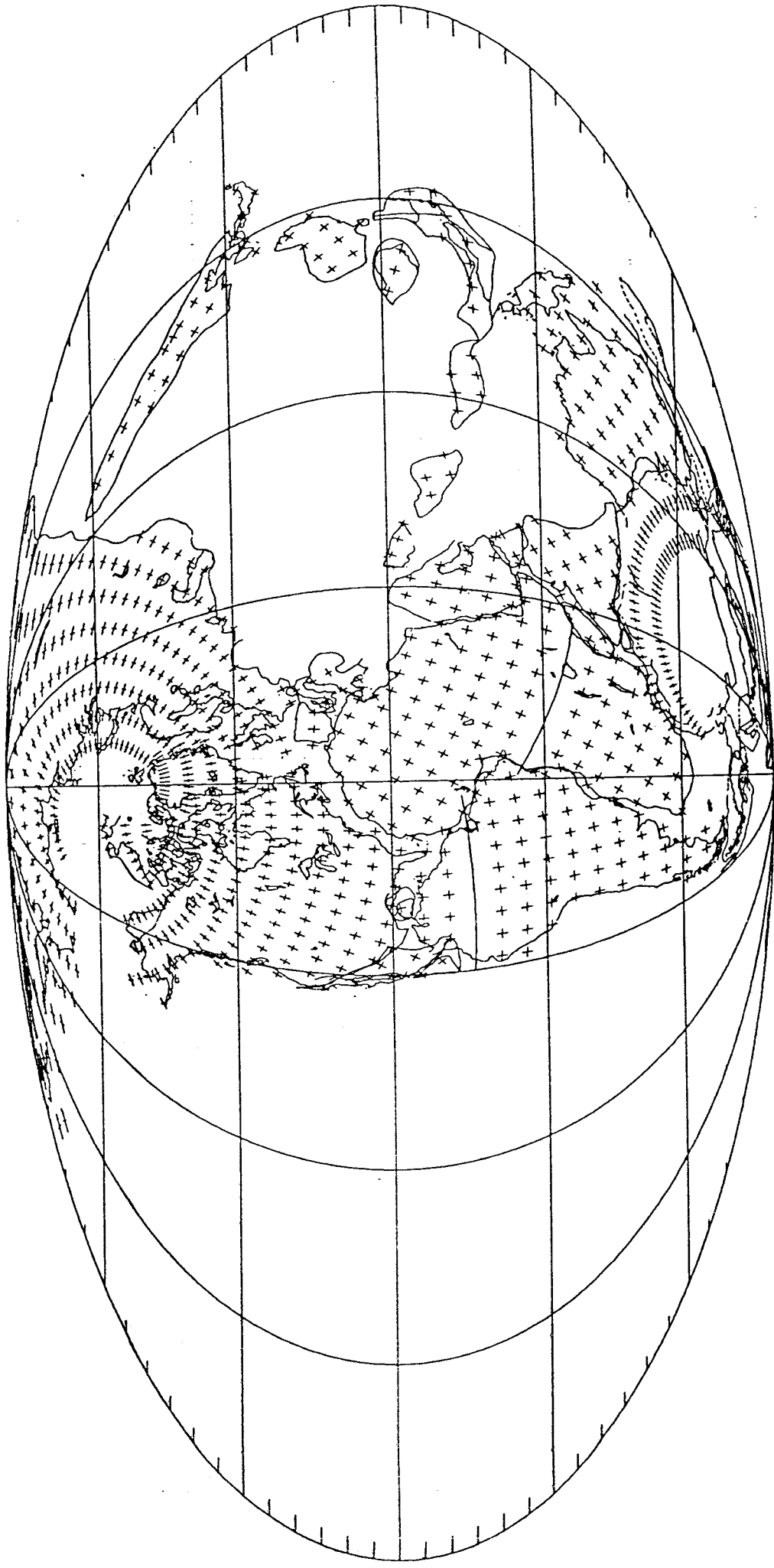
Pliensbachian 195.0 Ma



Norian 216.0 Ma

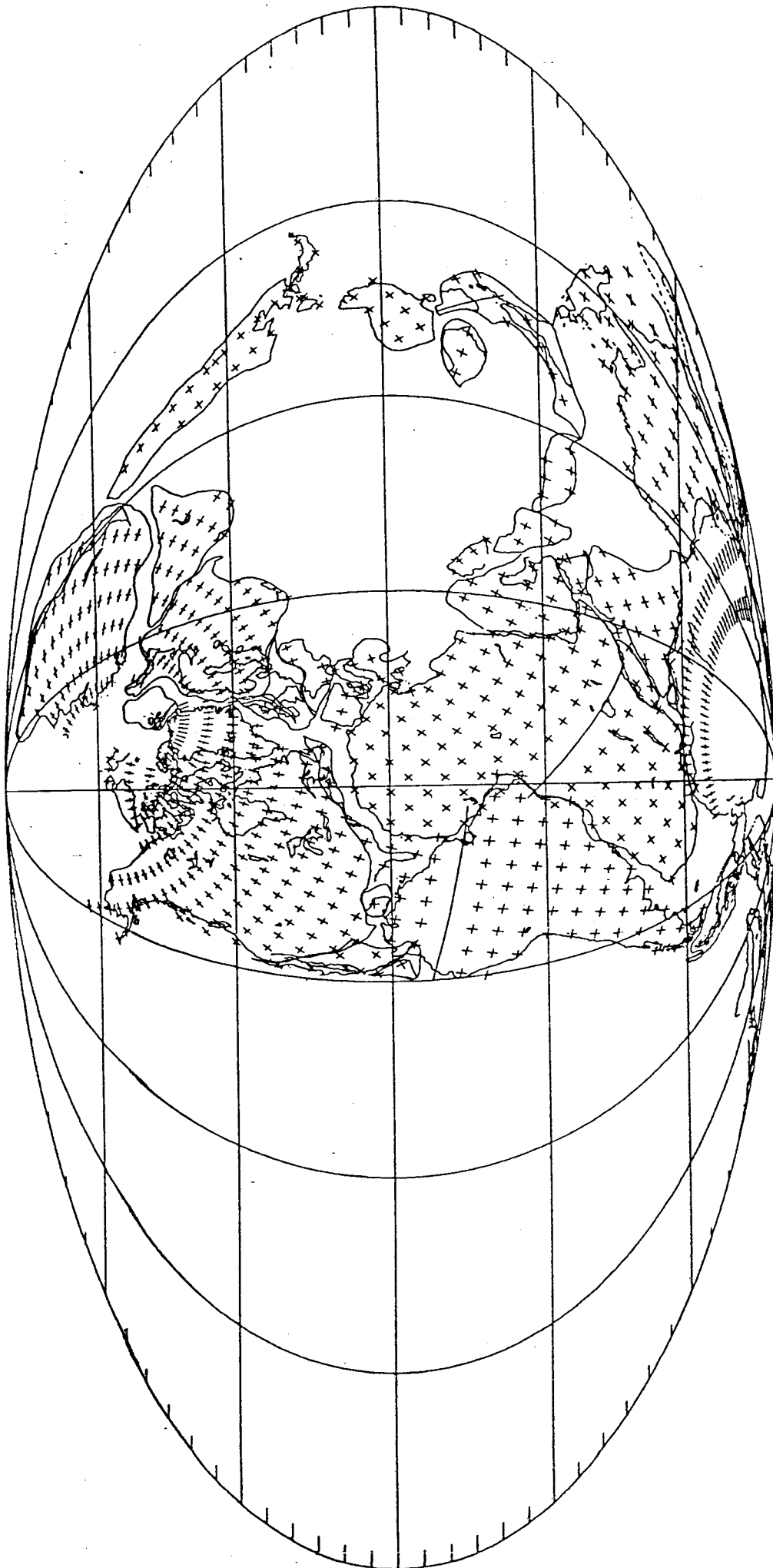


Landinian 232.0 Ma

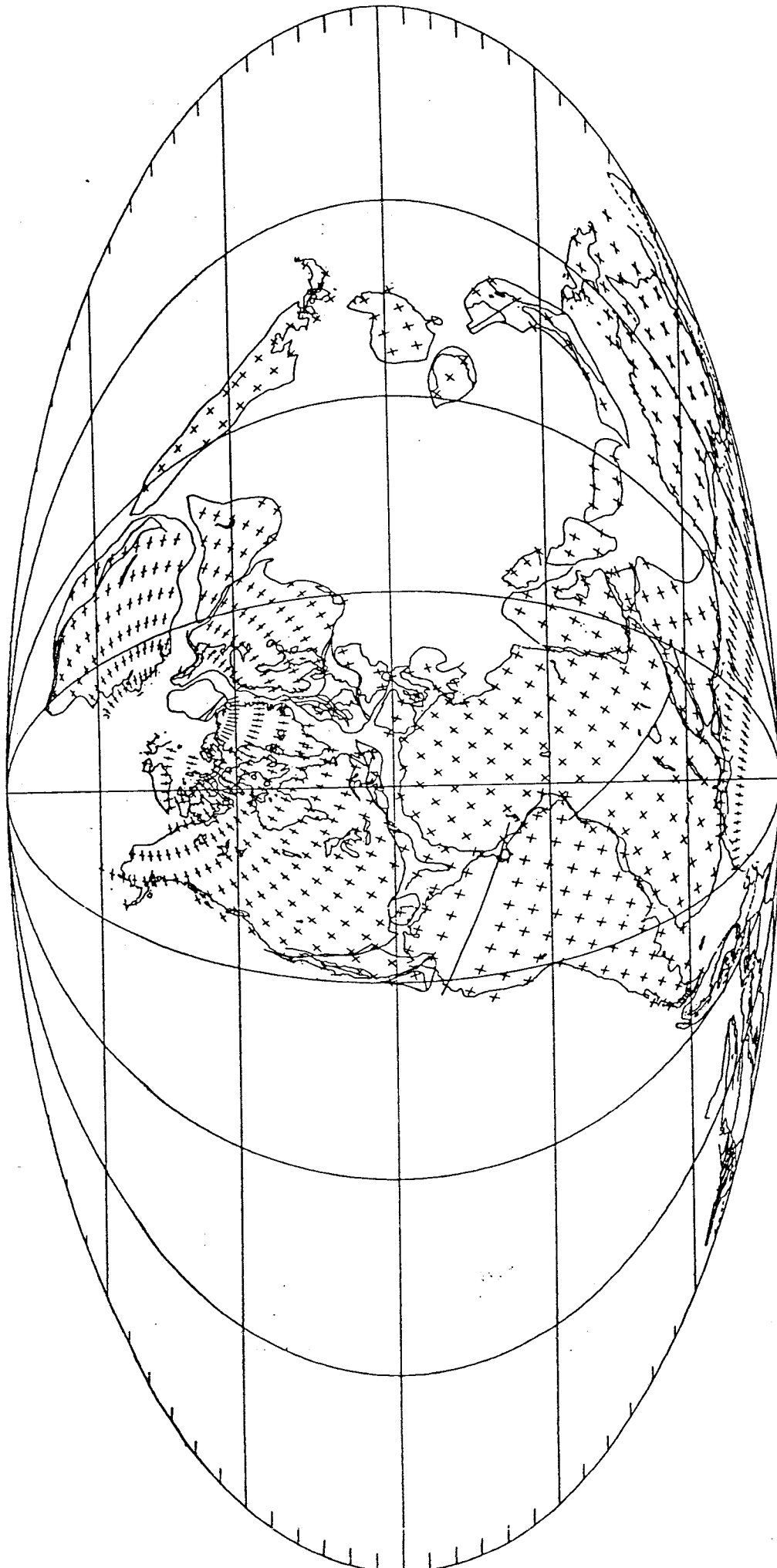


Scythian (Induan) 242.0 Ma

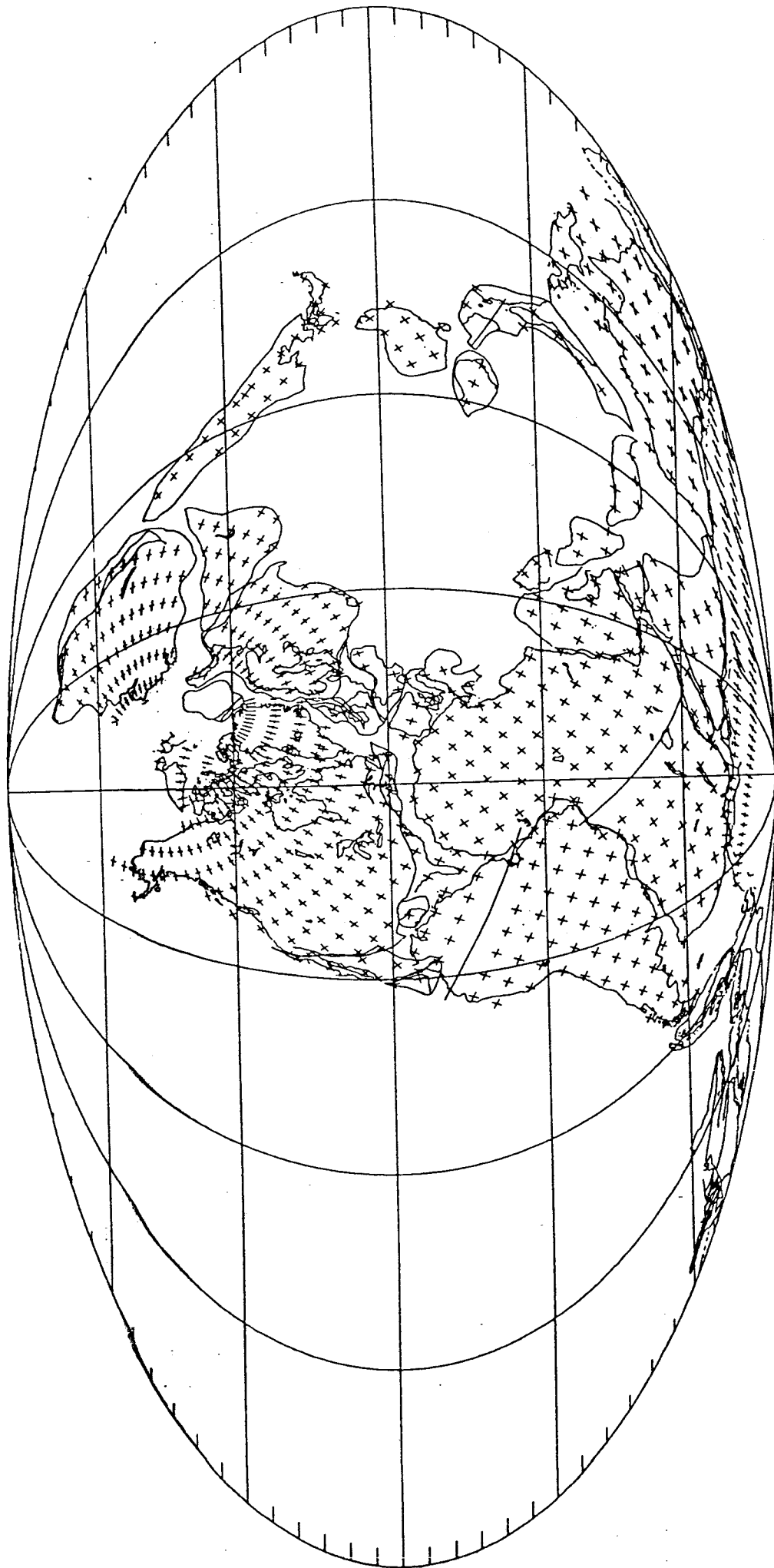
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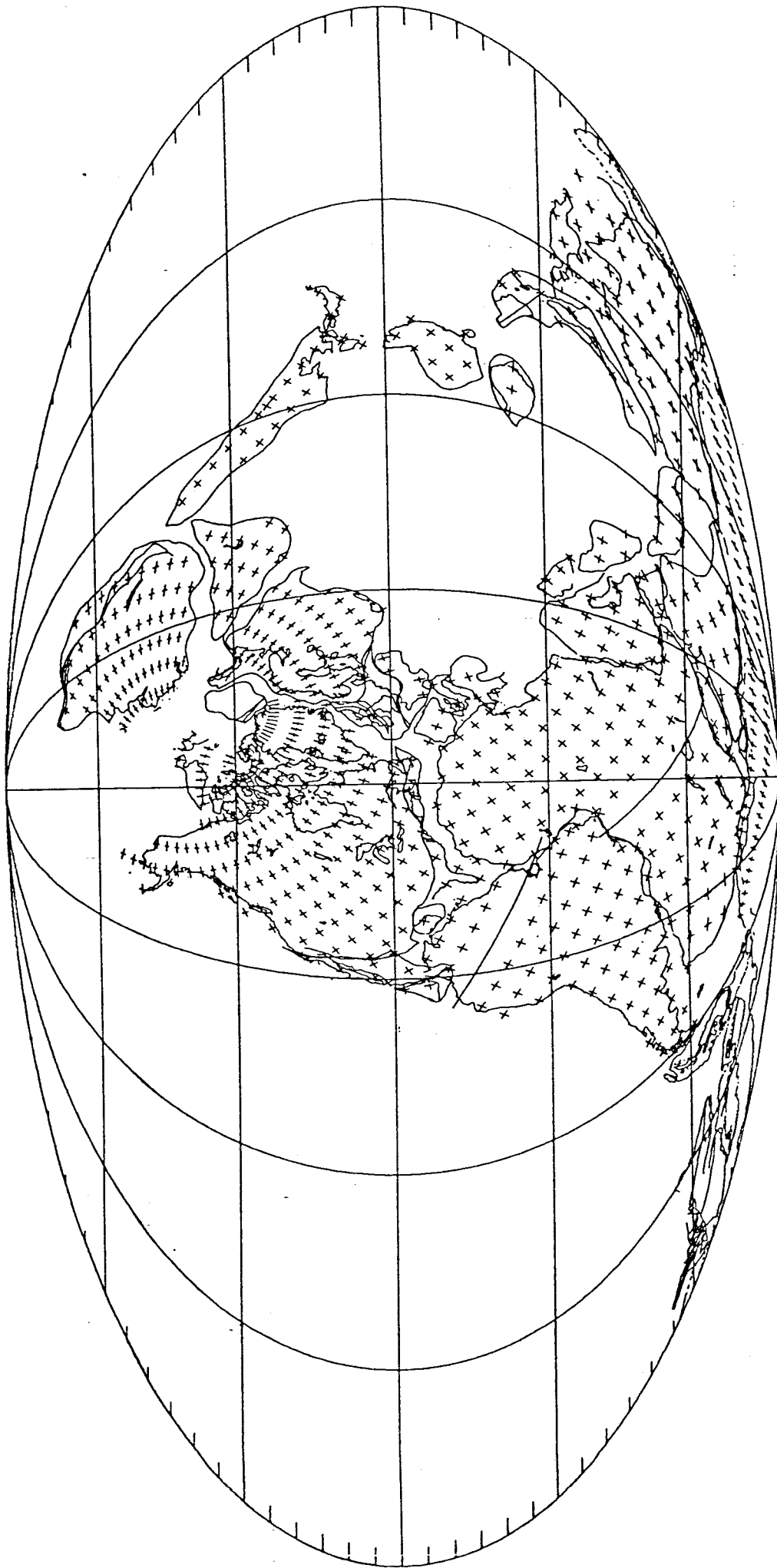
Kazanian 255.0 Ma



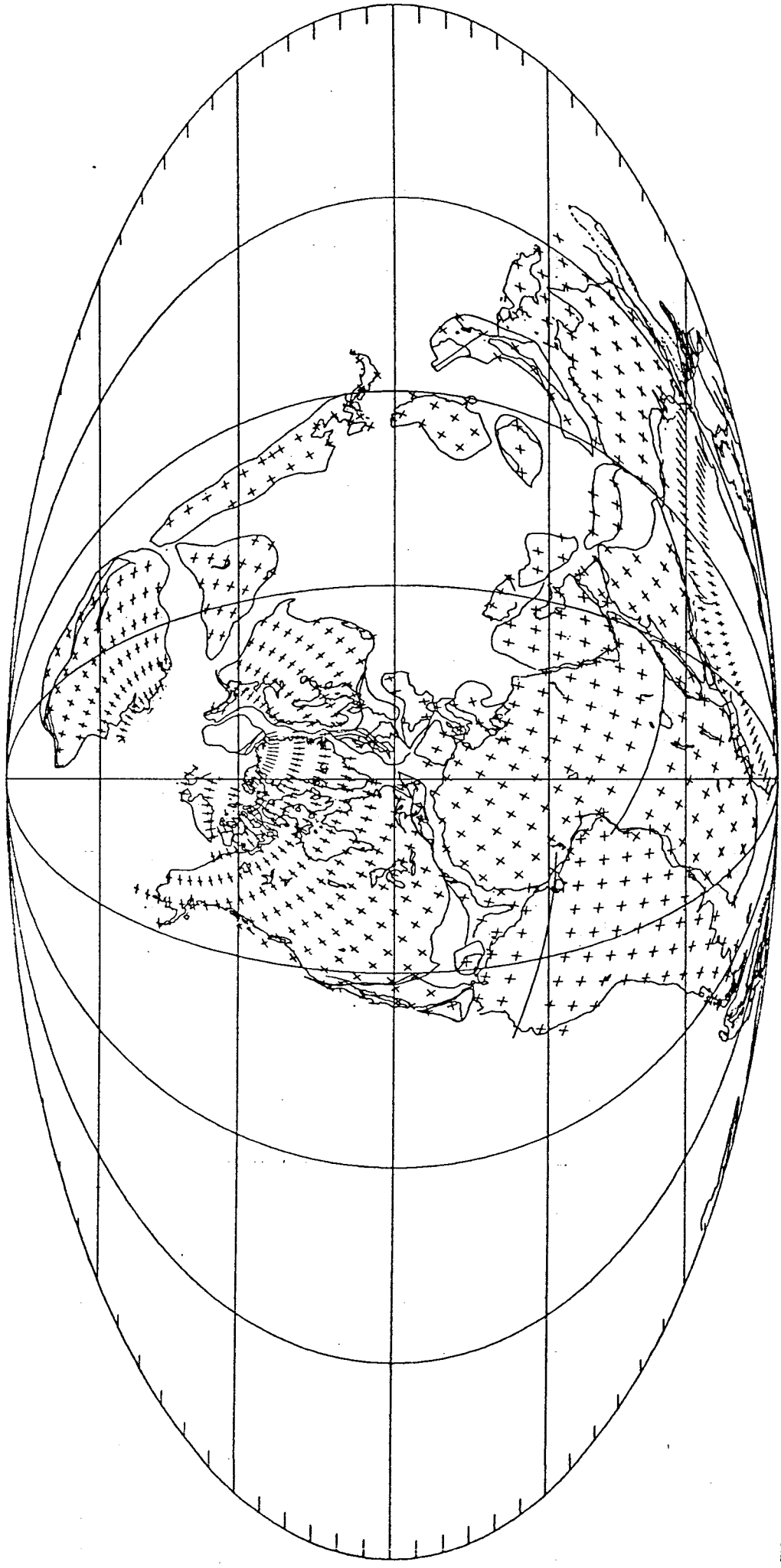
Artinskian 277.0 Ma



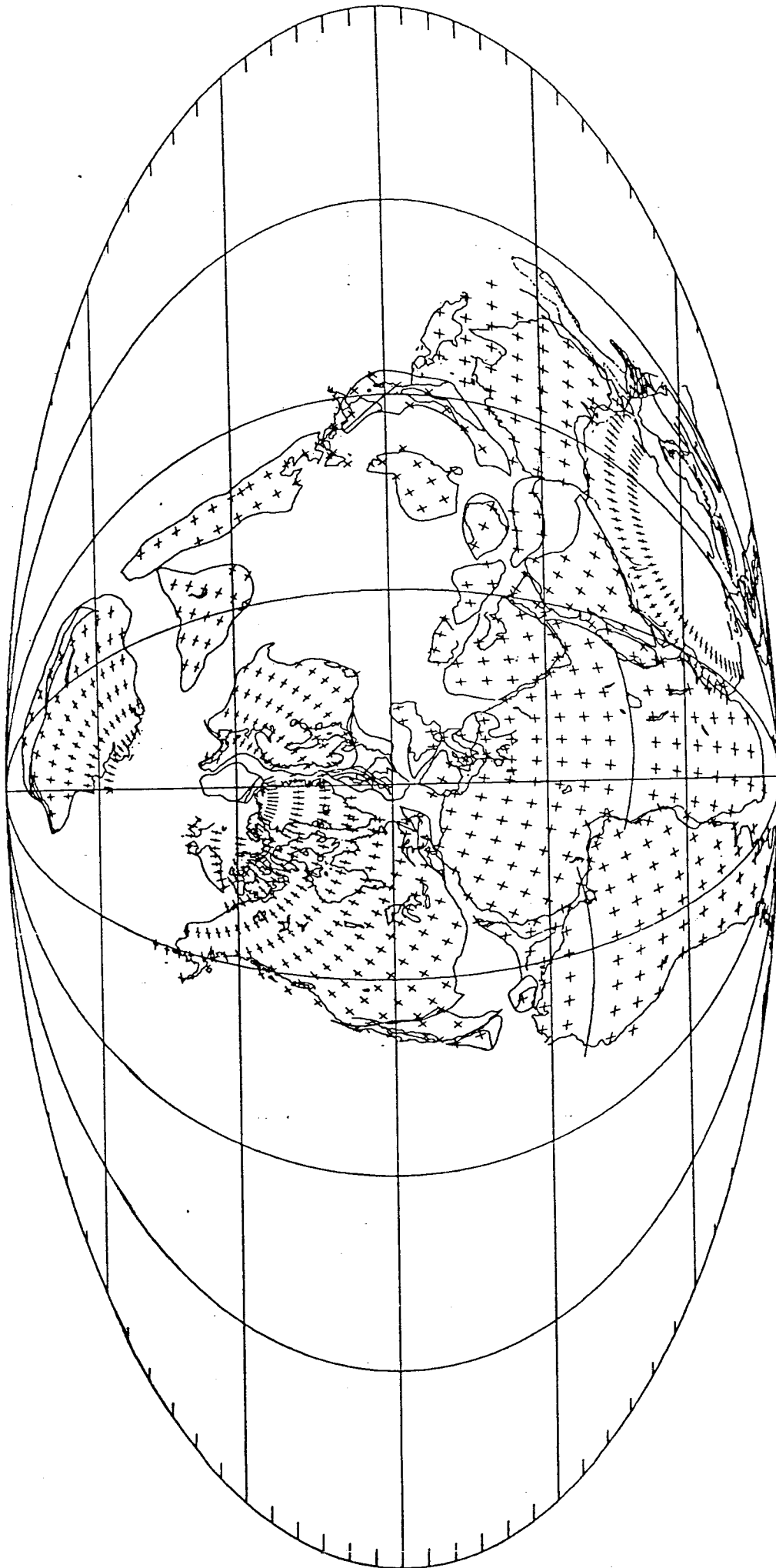
Stephanian 291.0 Ma



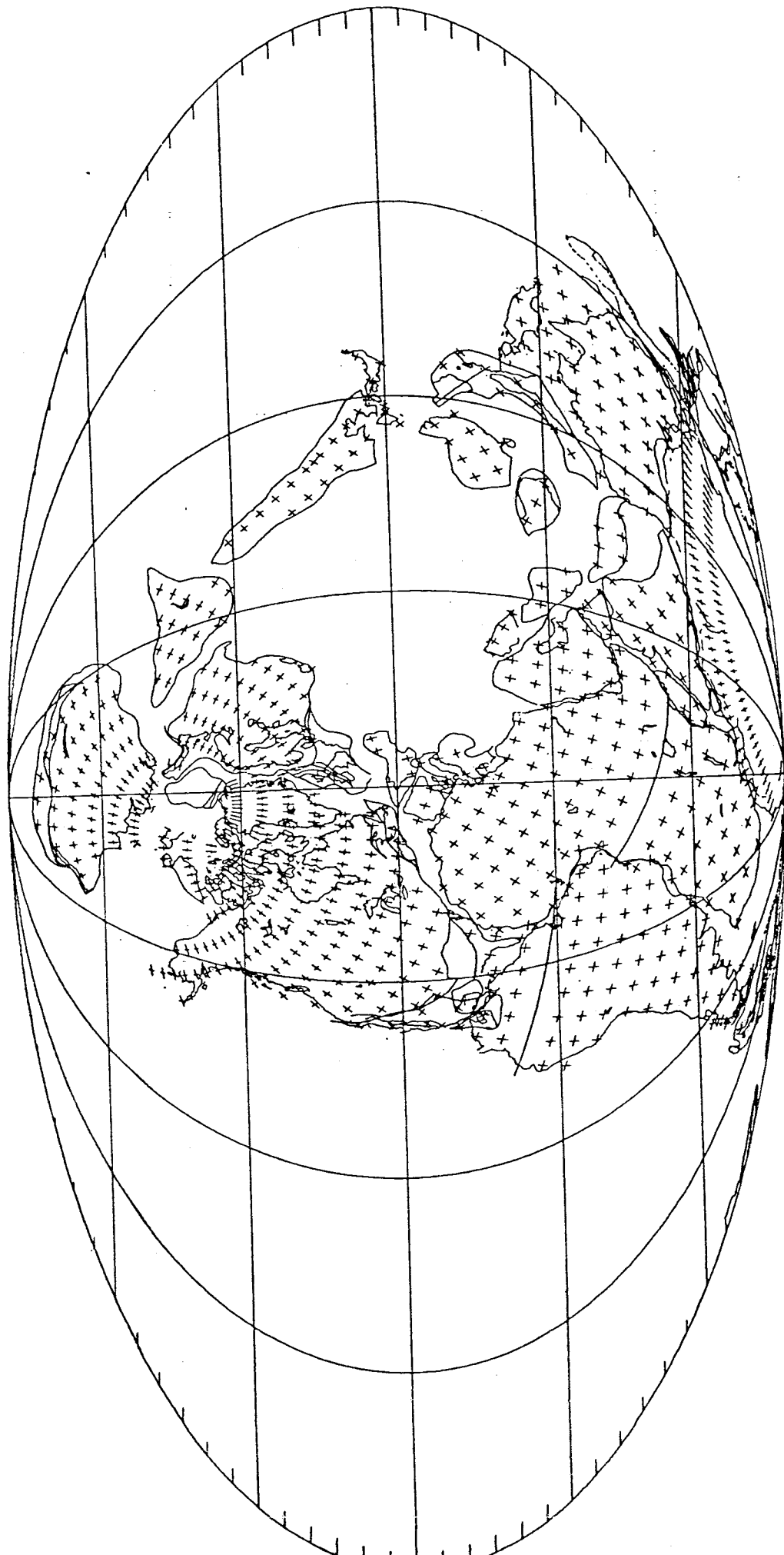
Westphalian 306.0 Ma



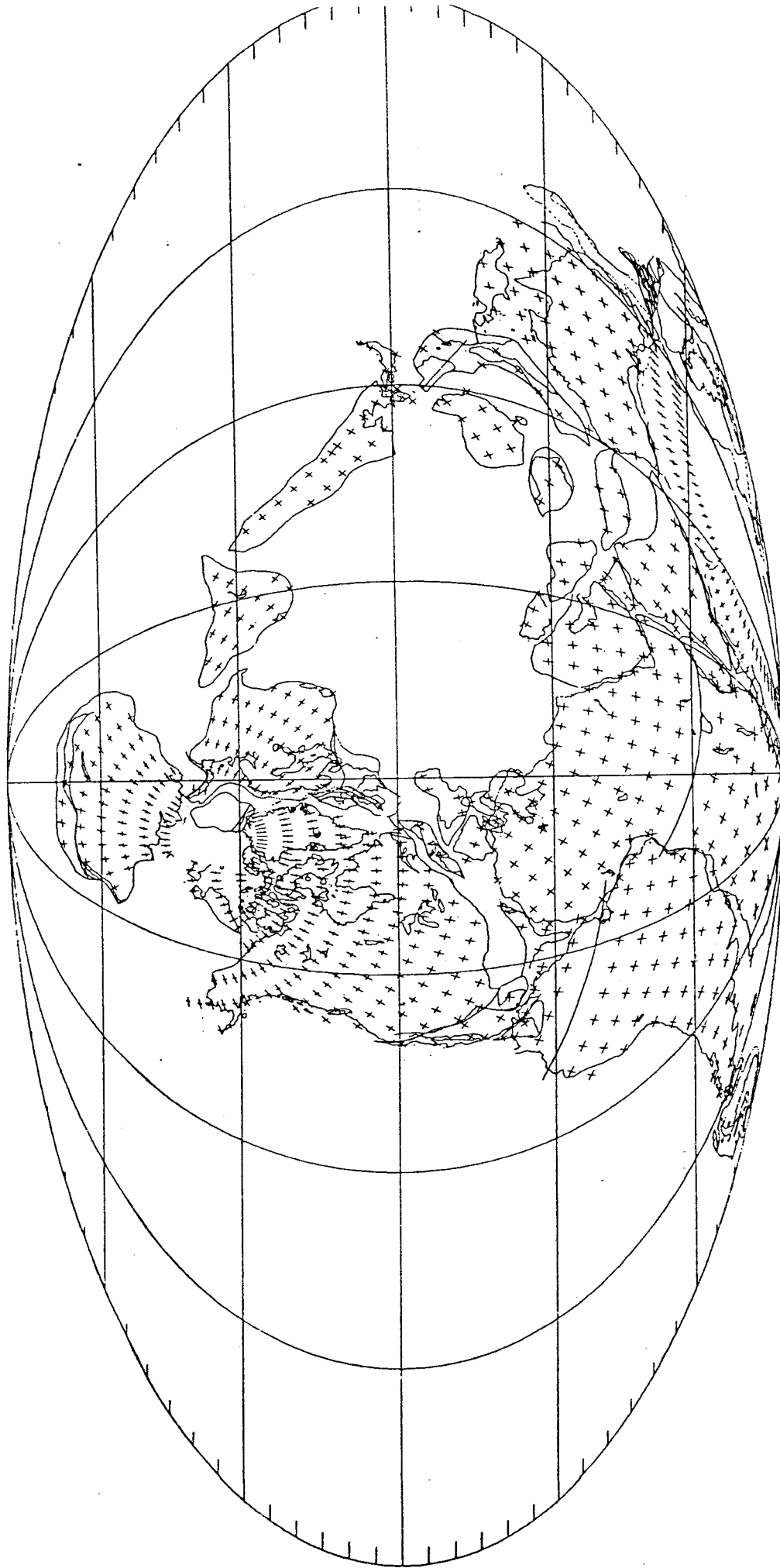
Namurian 324.0 Ma



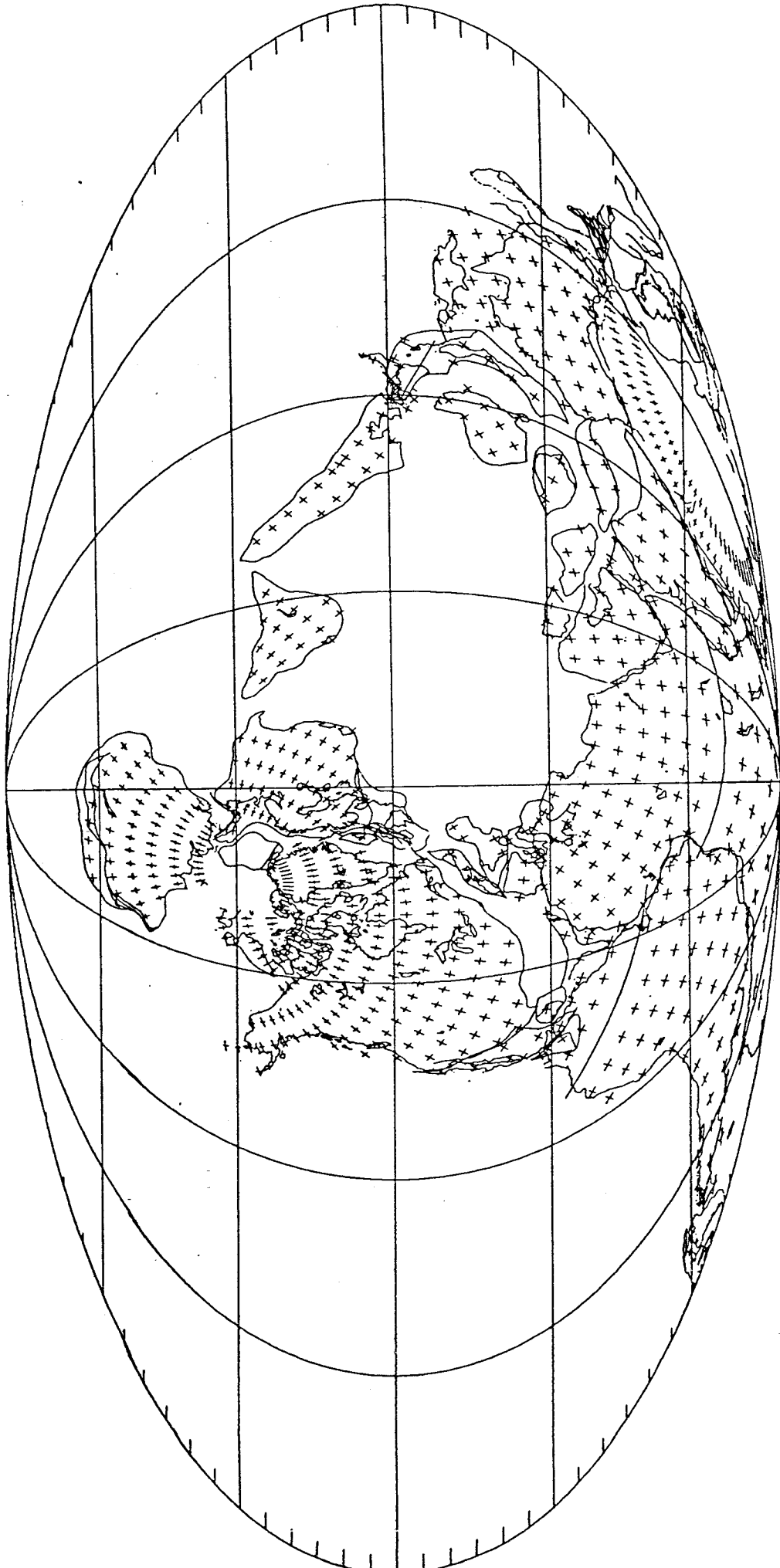
Visean 342.0 Ma



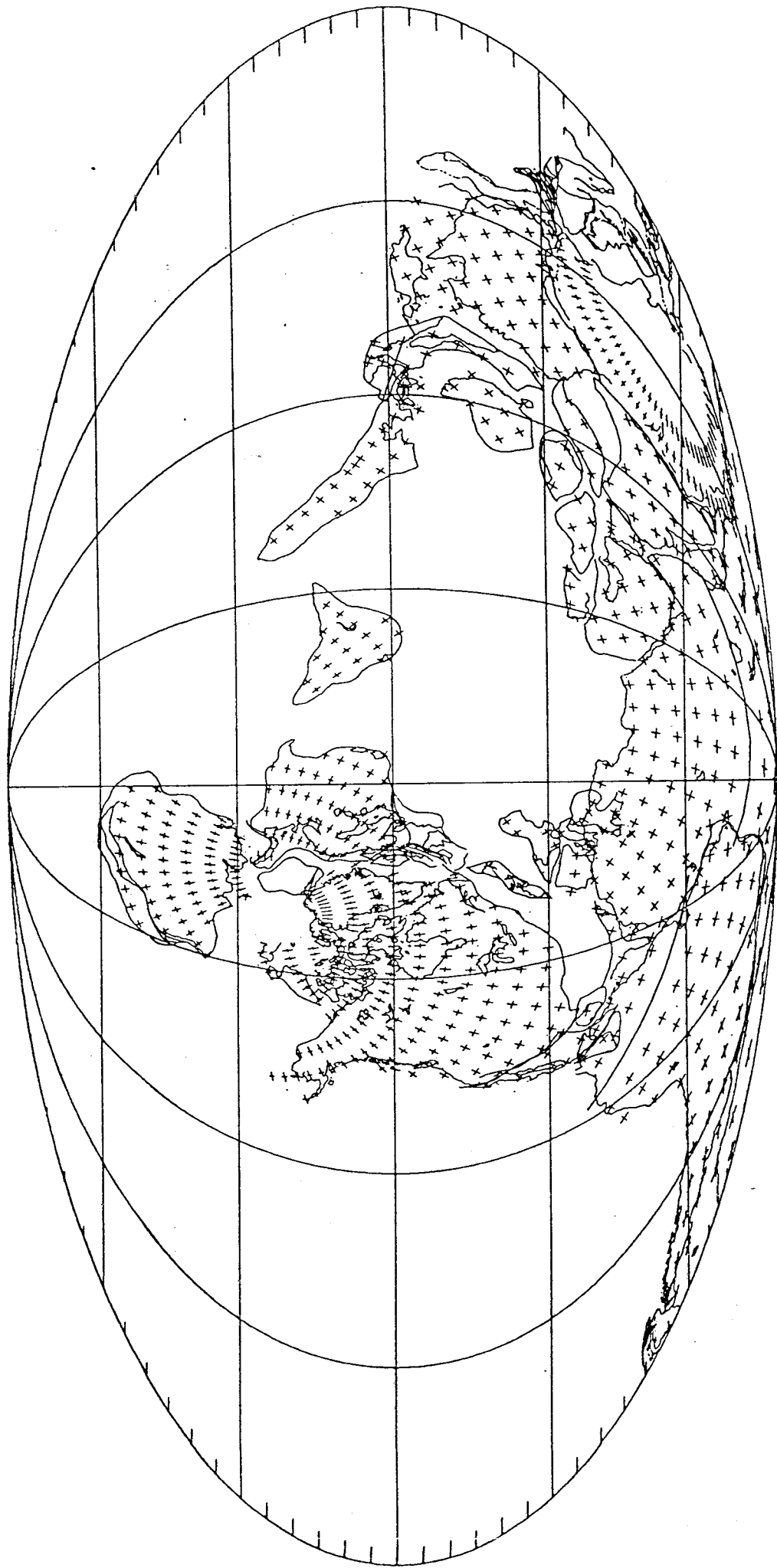
Fairmenian 363.0 Ma



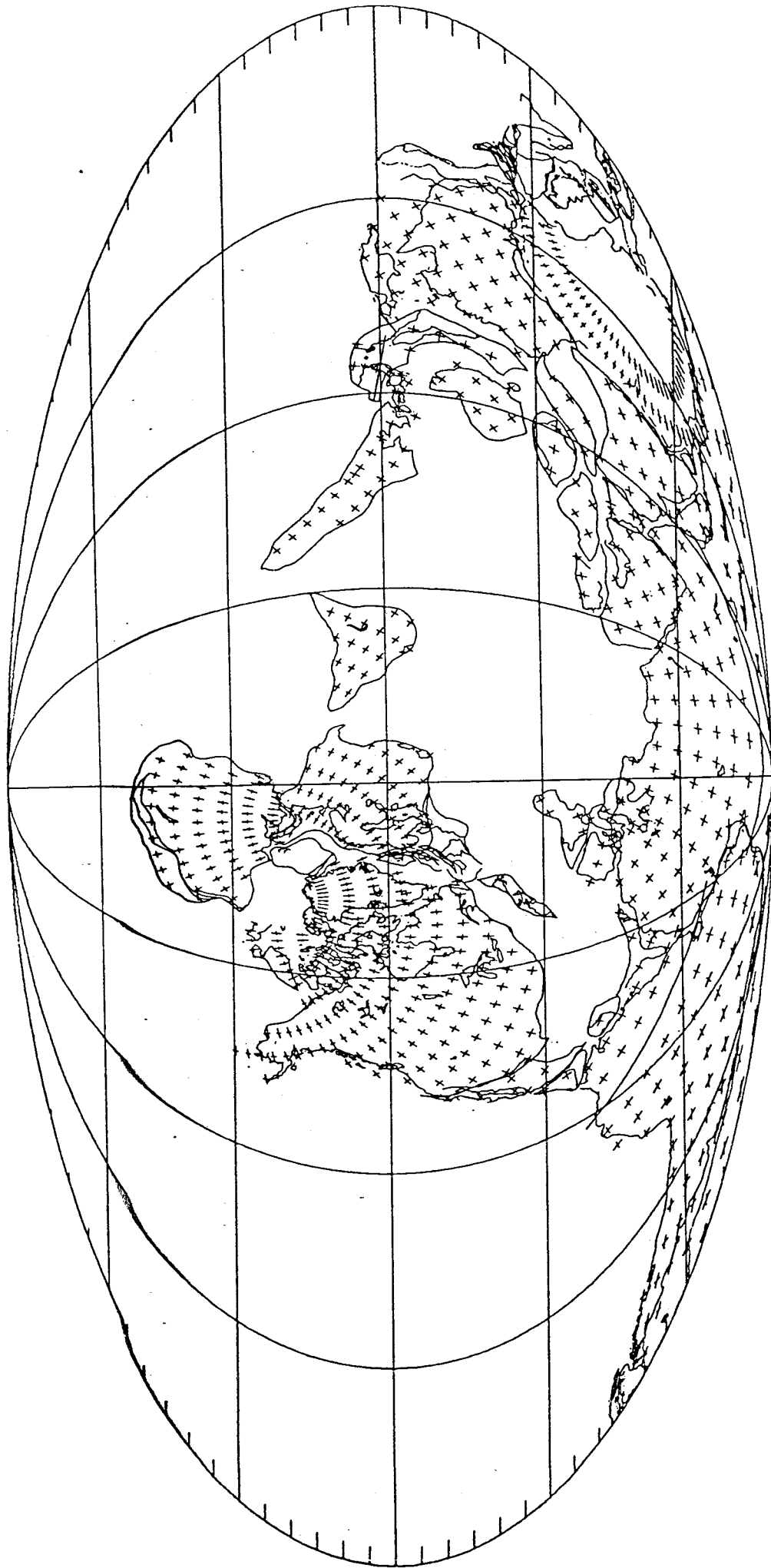
Givetian 377.0 Ma



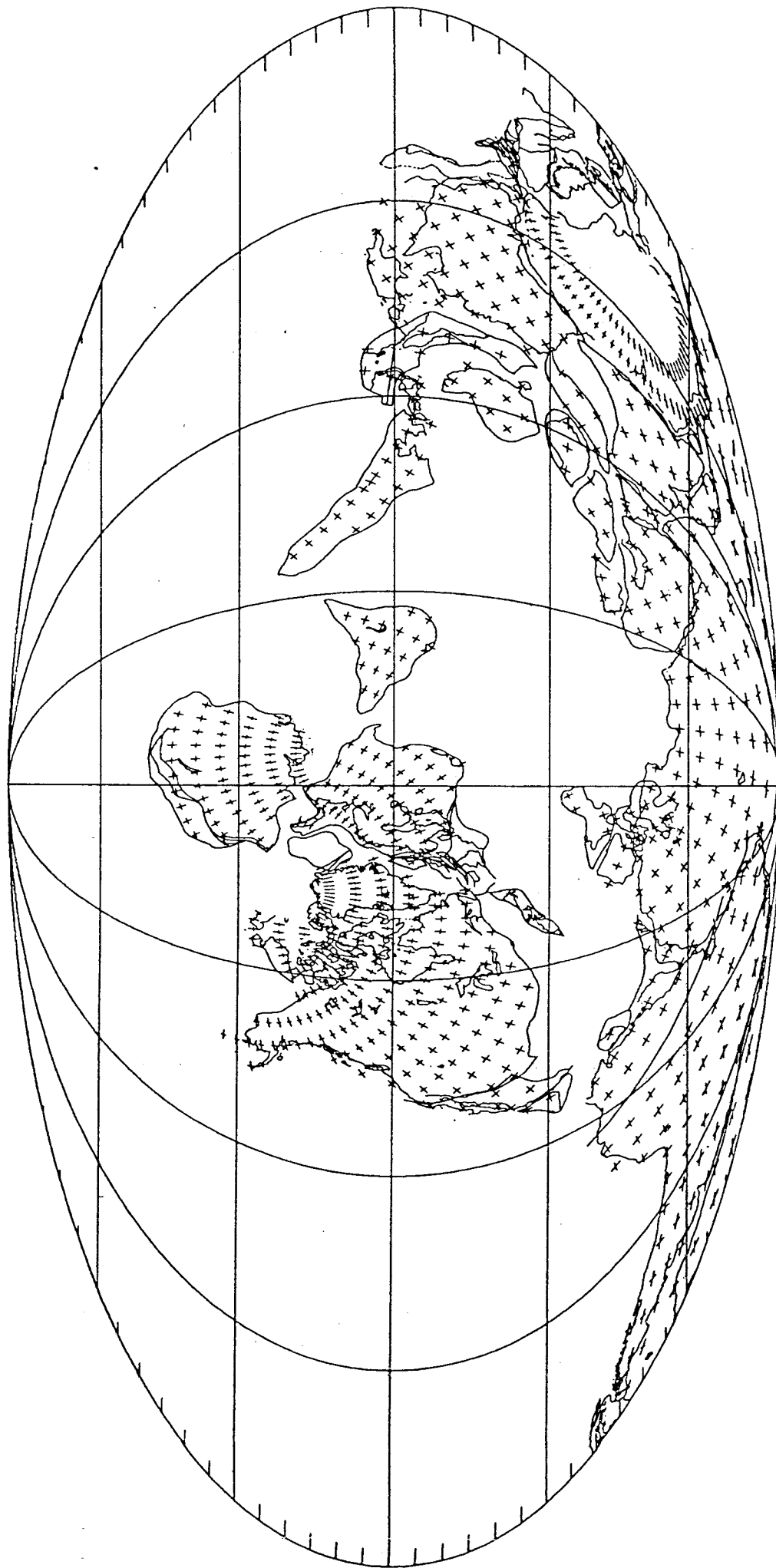
Emsian 390.0 Ma



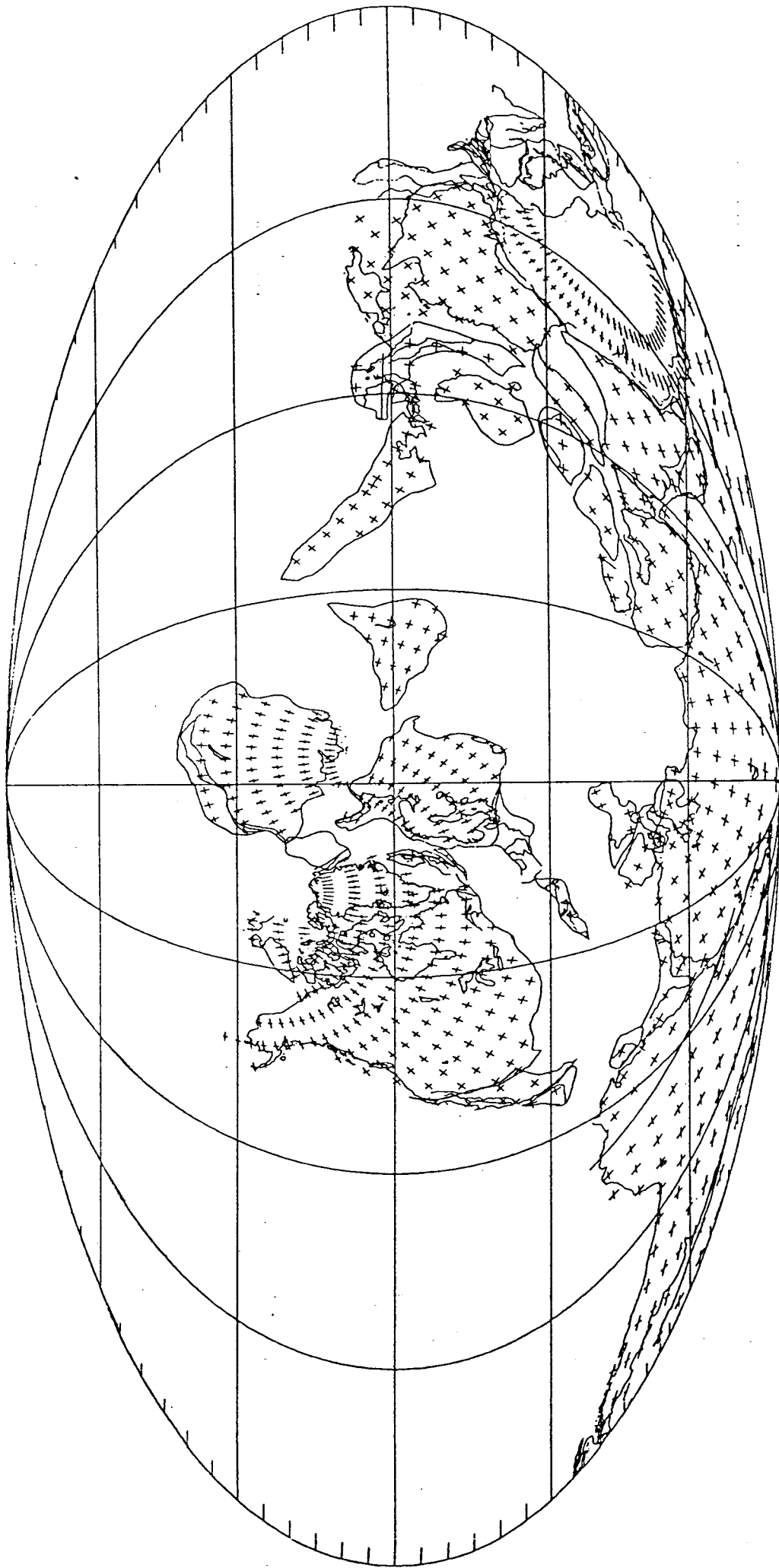
Gedinnian 404.0 Ma



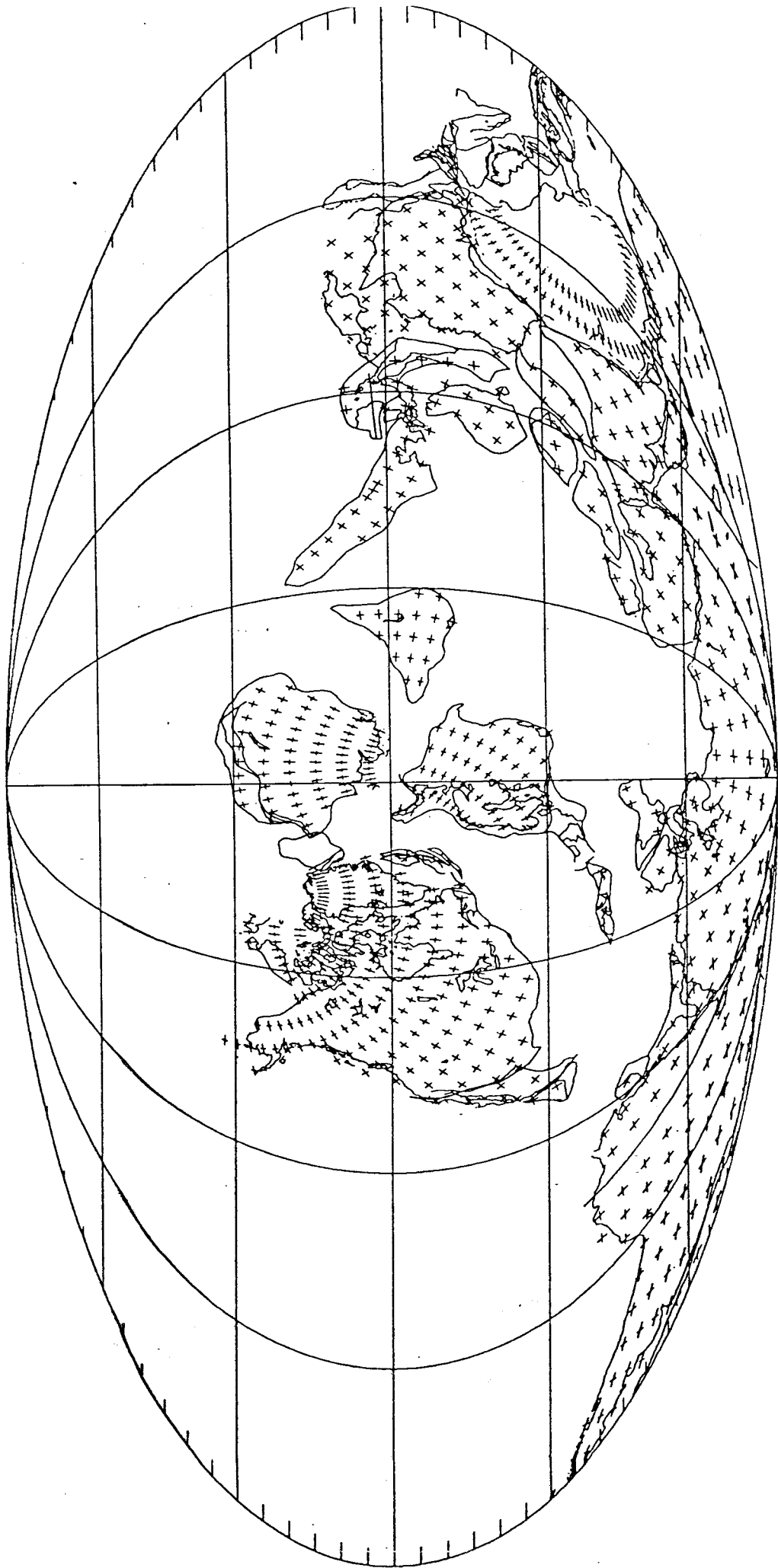
Ludlovian 418.0 Ma



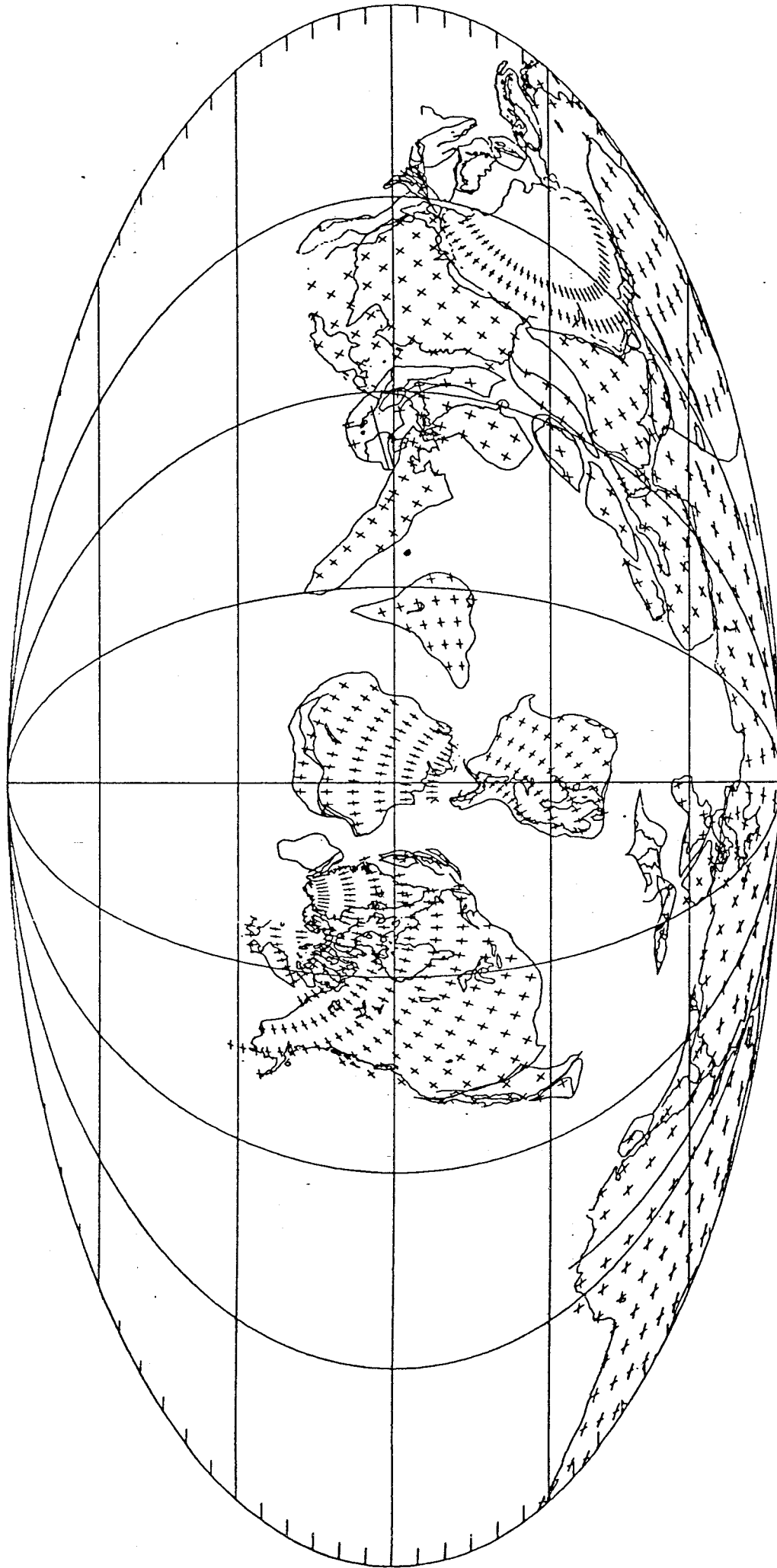
Menloctian 425.0 Ma



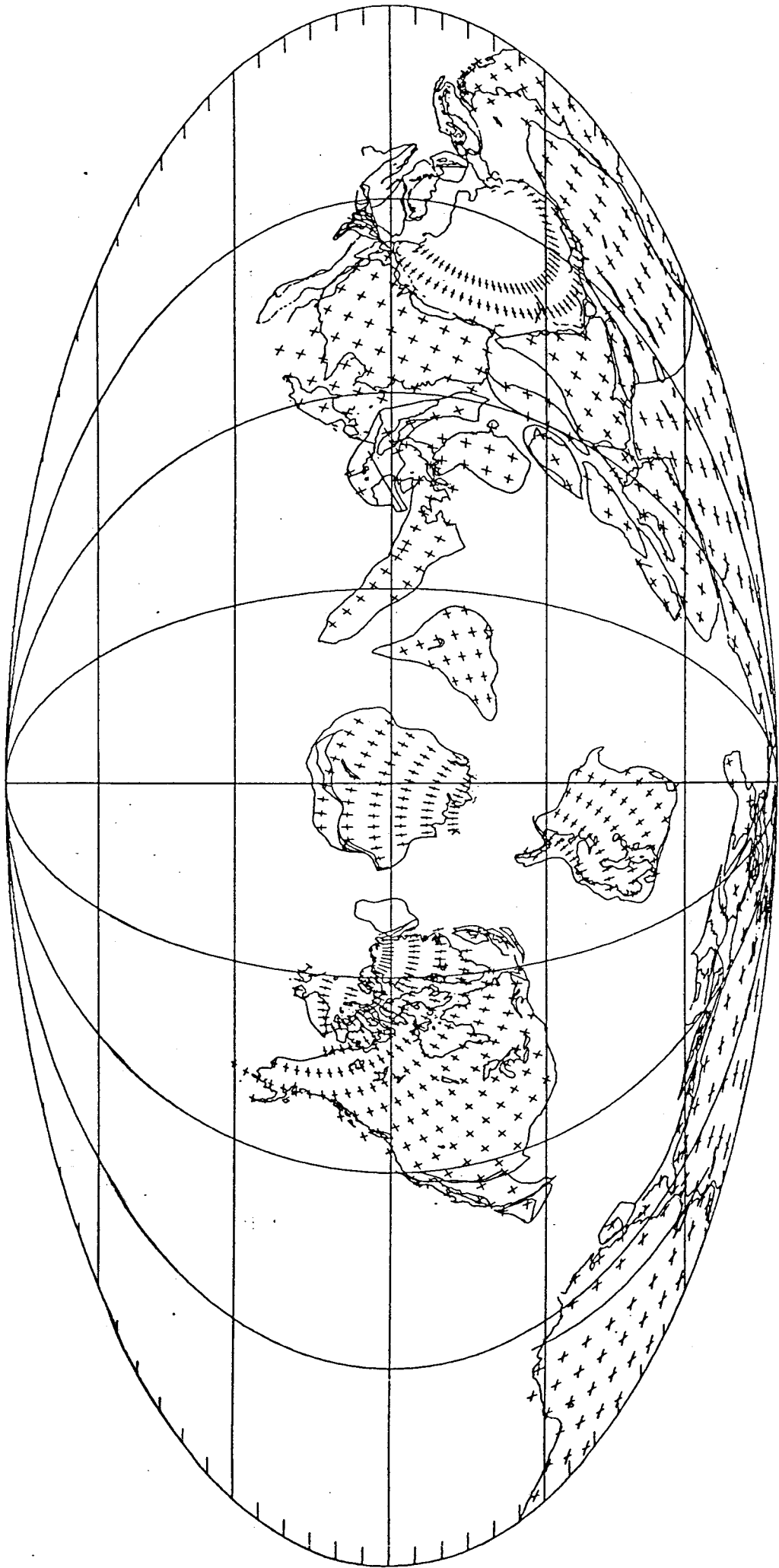
Llandoveryian 433.0 Ma



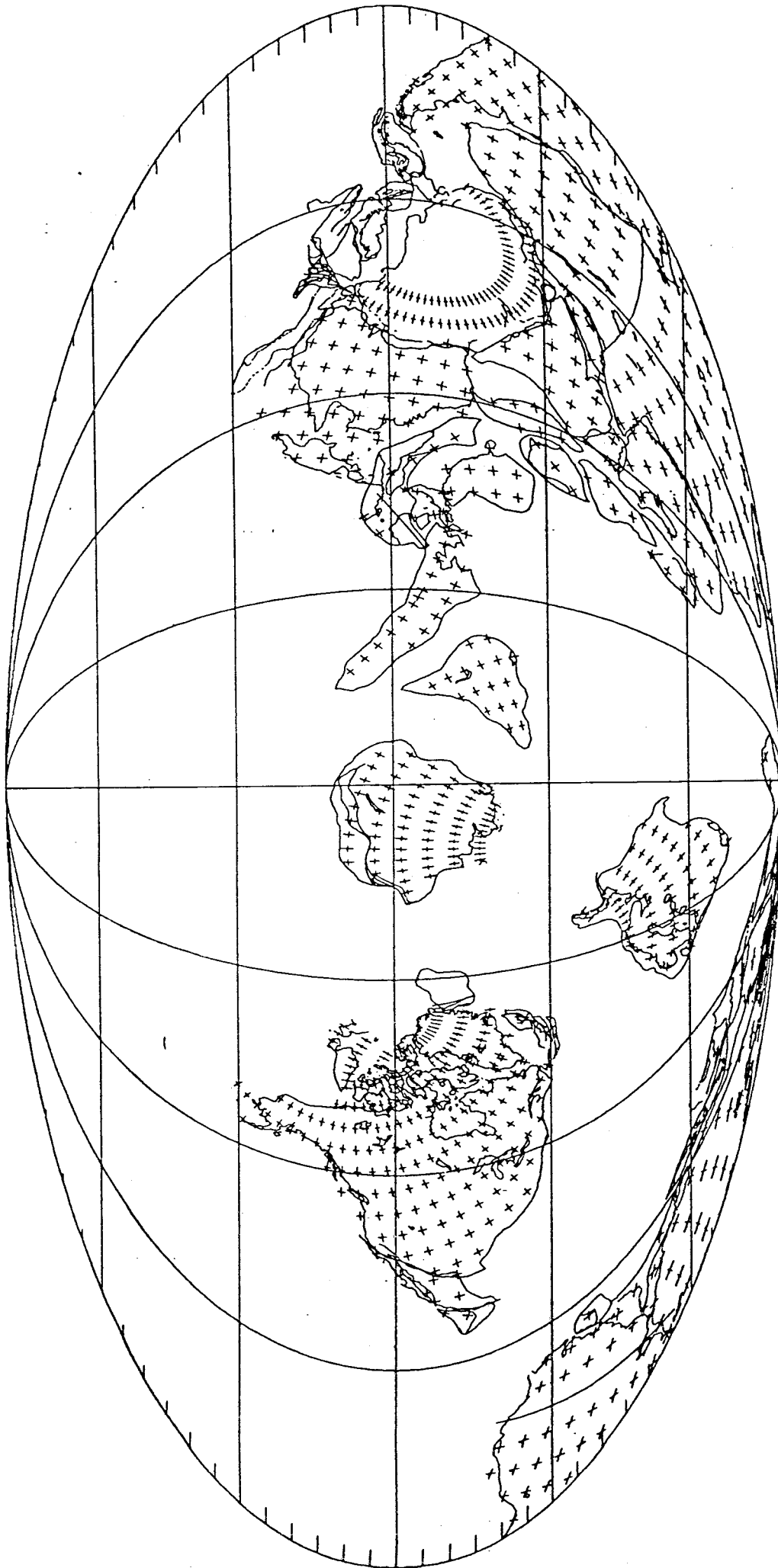
Ashgillian 443.0 Ma



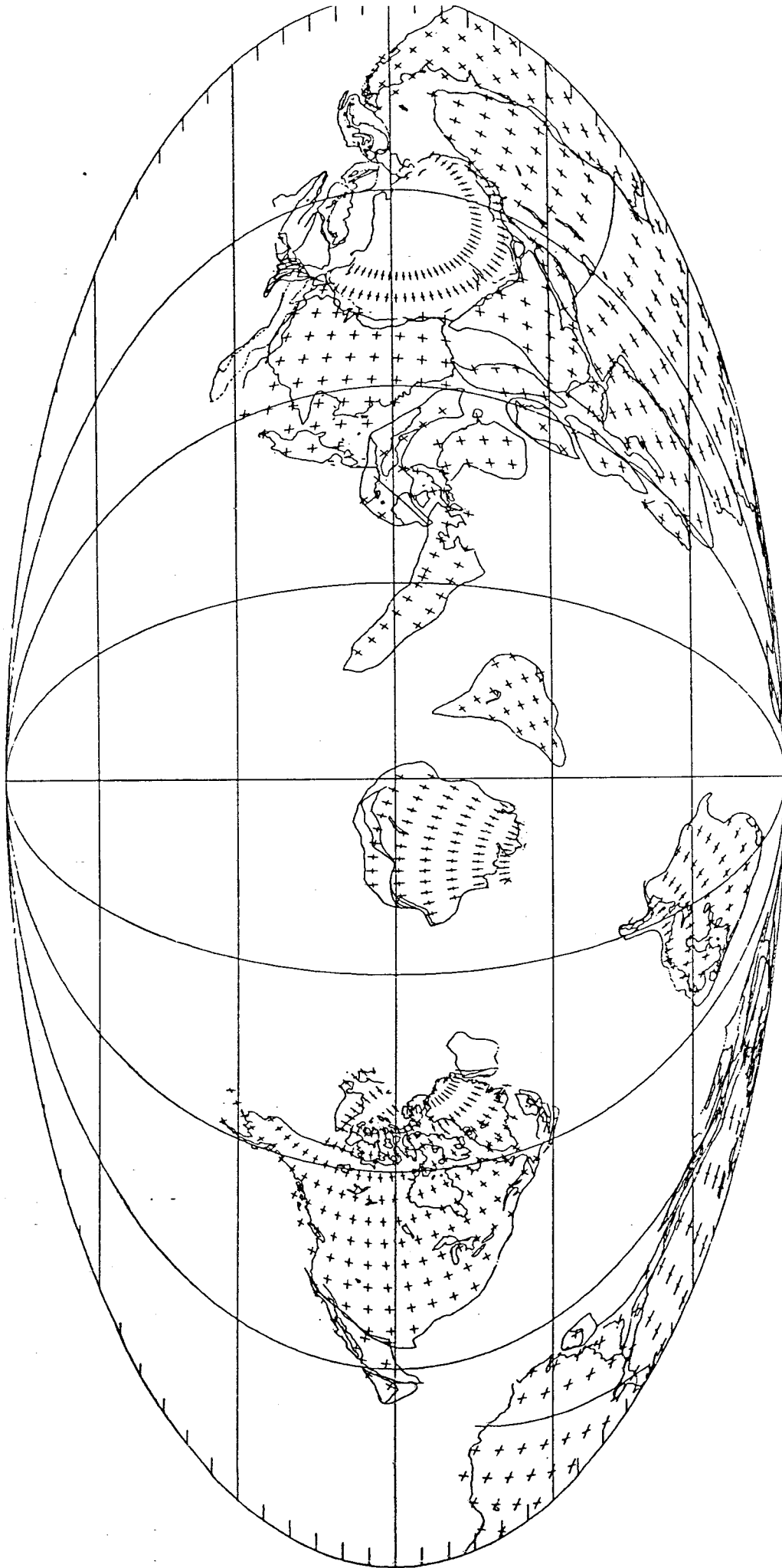
Llandeilo-Caradoc 458.0 Ma



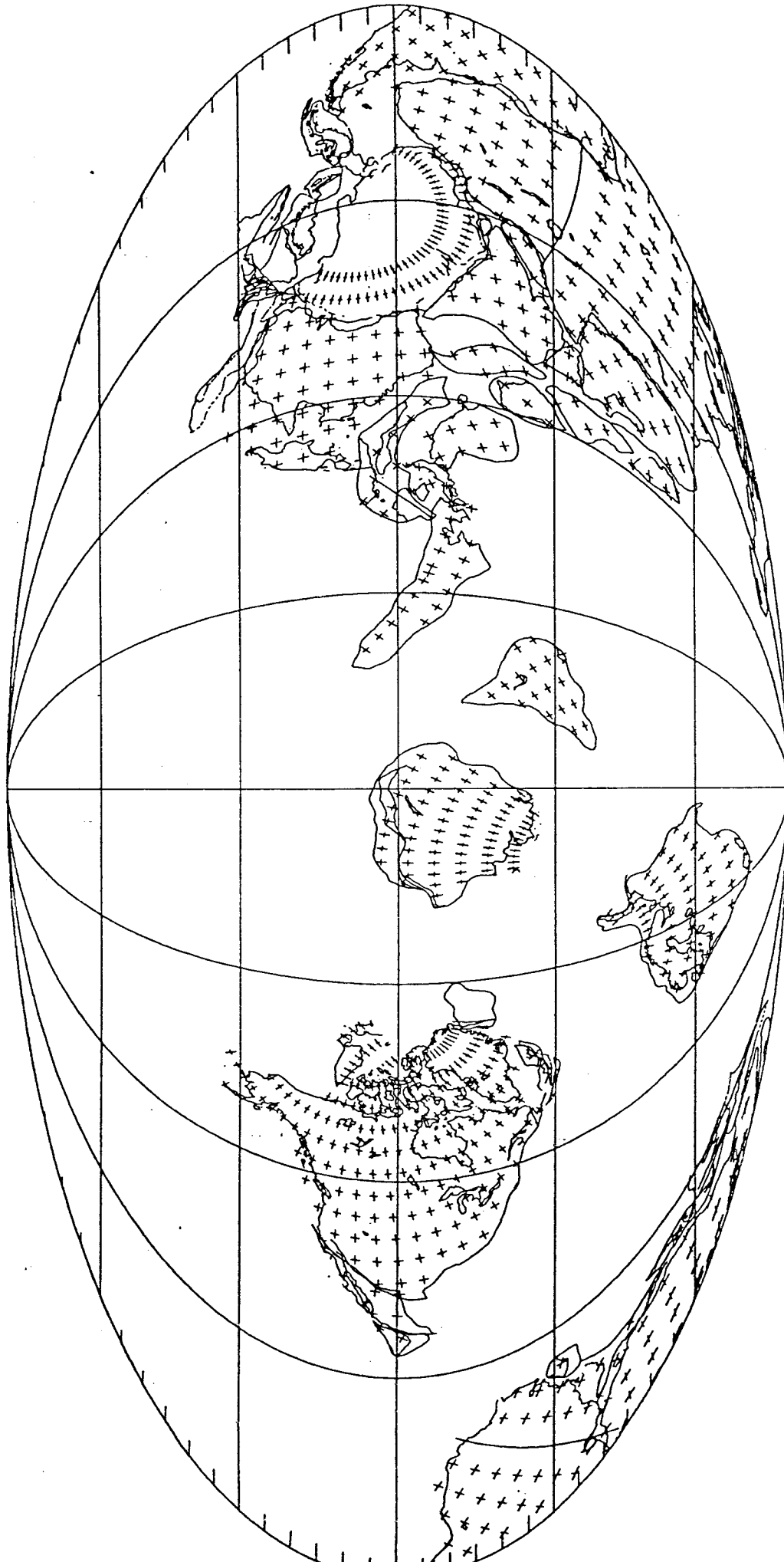
Arenigian 478.0 Ma



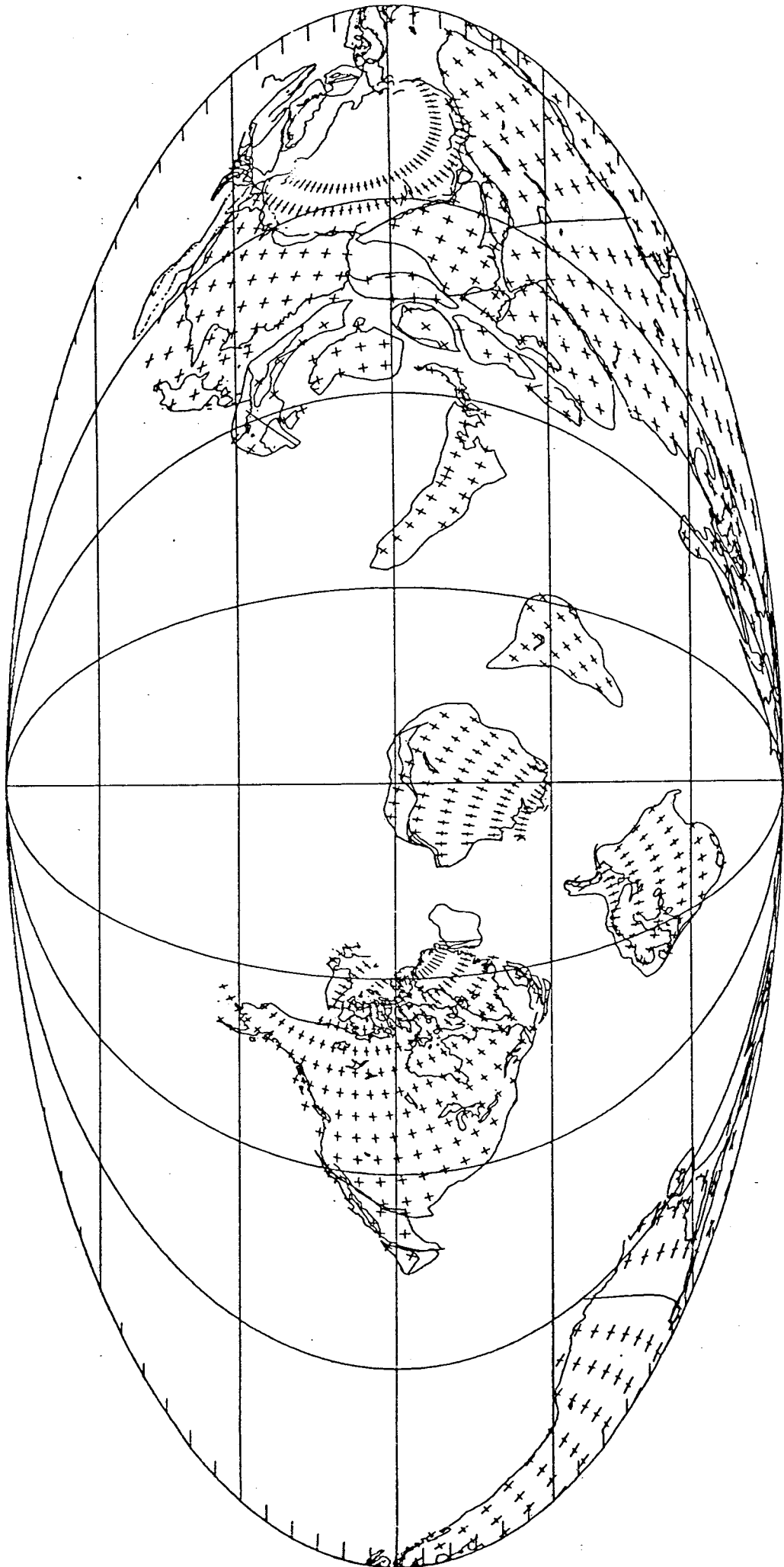
Tremadocian 497.0 Ma



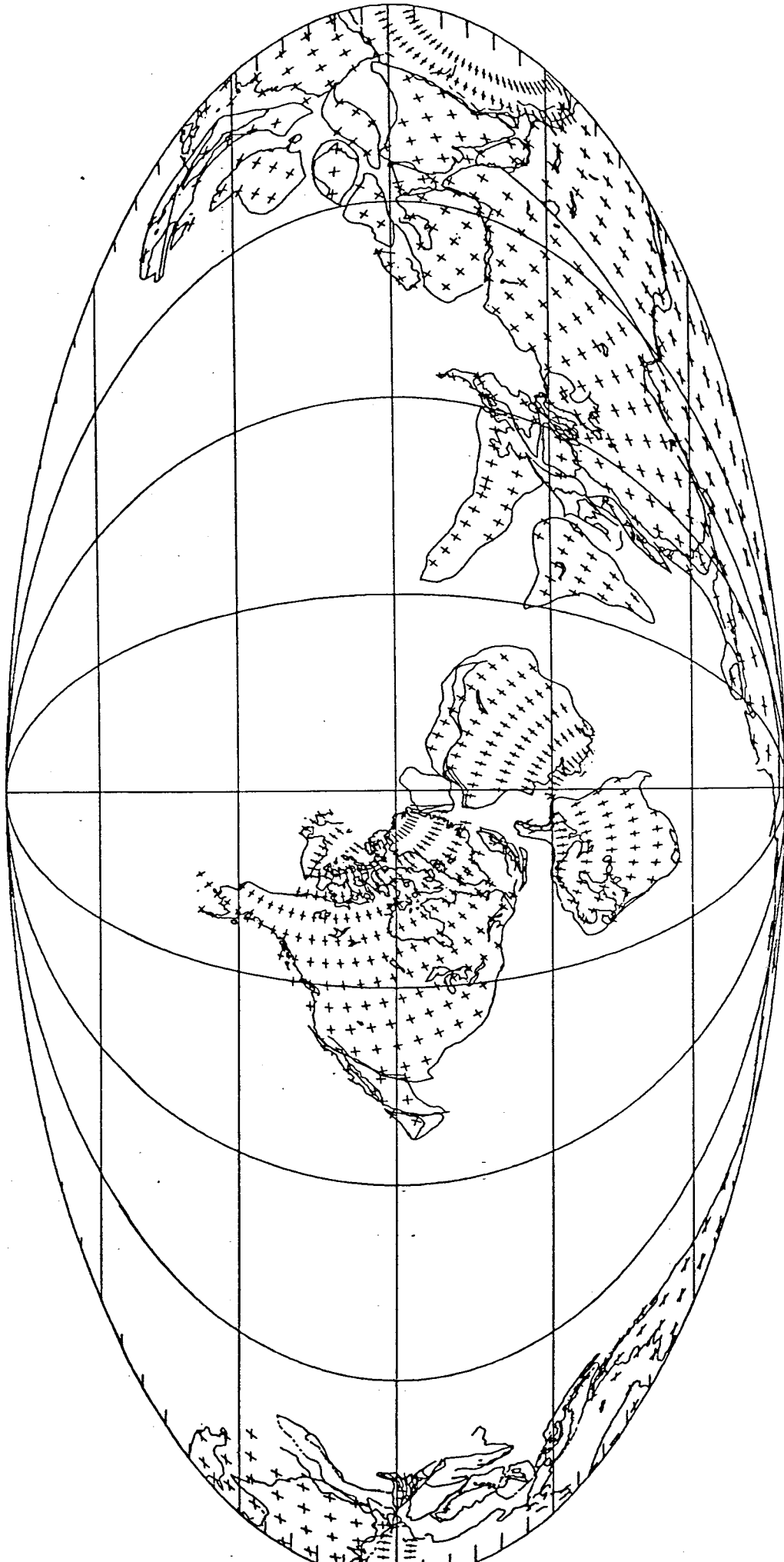
Late Cambrian 514.0 Ma



Middle Cambrian 532.0 Ma



Early Cambrian 555.0 Ma



Tommotian 600.0 Ma