ES 10 Jan 22 and 24 J. Bartolome
Topic: Cosmology and Earth History

1. Application of systems and hierarchy theory to the topic
2. Origins of the universe, the big bang
3. Origin of chemical elements
4. Origin of solar system and planets
5. Comparative planetary science, unique characteristics of the earth's physical systems
6. Internal structure of the earth
7. Continental drift and plate tectonics

Figures: 2.1 Schlesinger (elemental abundance in solar system); 2.3 Schlesinger (characteristics of inner planets); 2.2 Allaby (earth's plates)

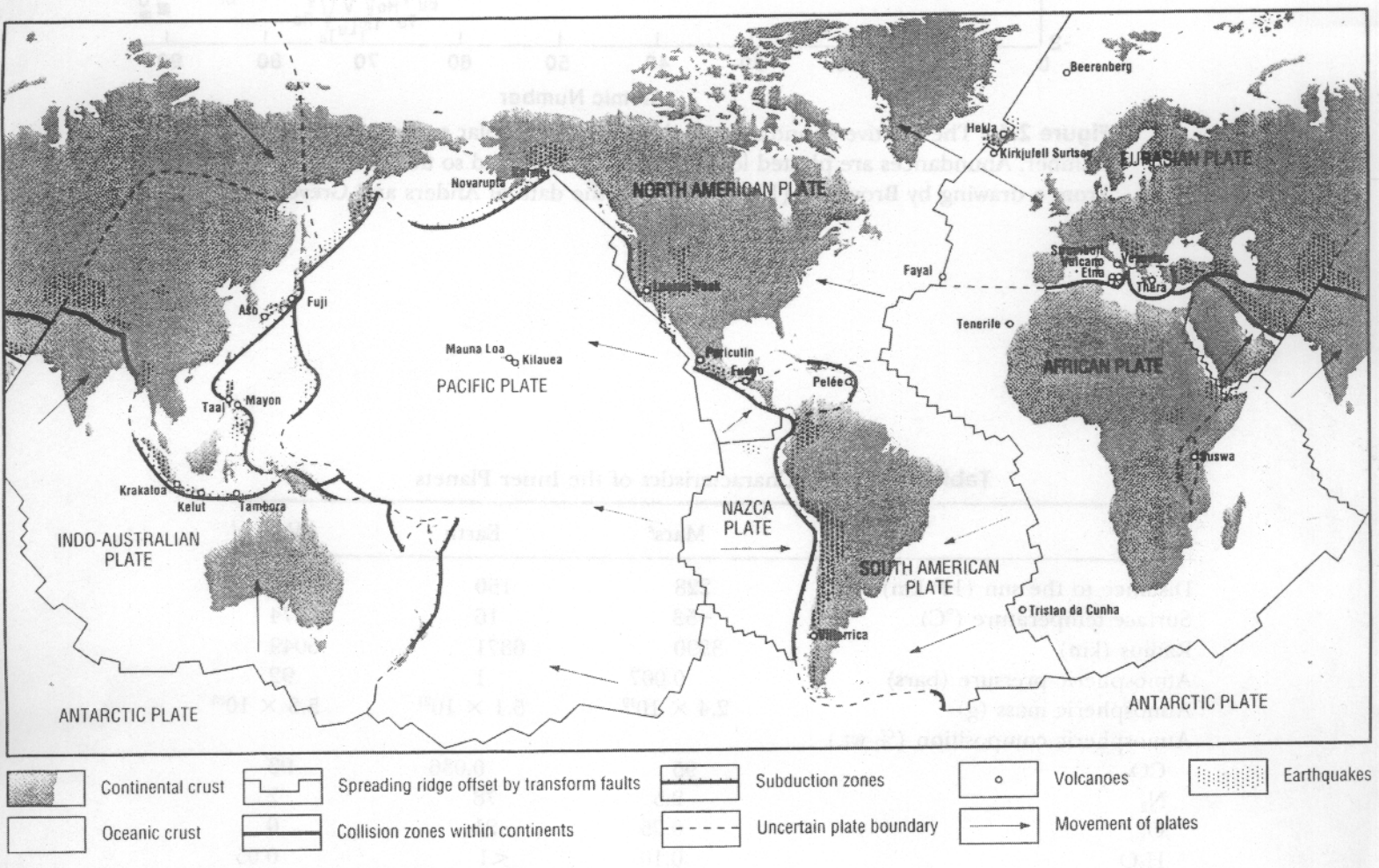

Figure 2.2 ***Plate structure of the Earth and seismically active zones***

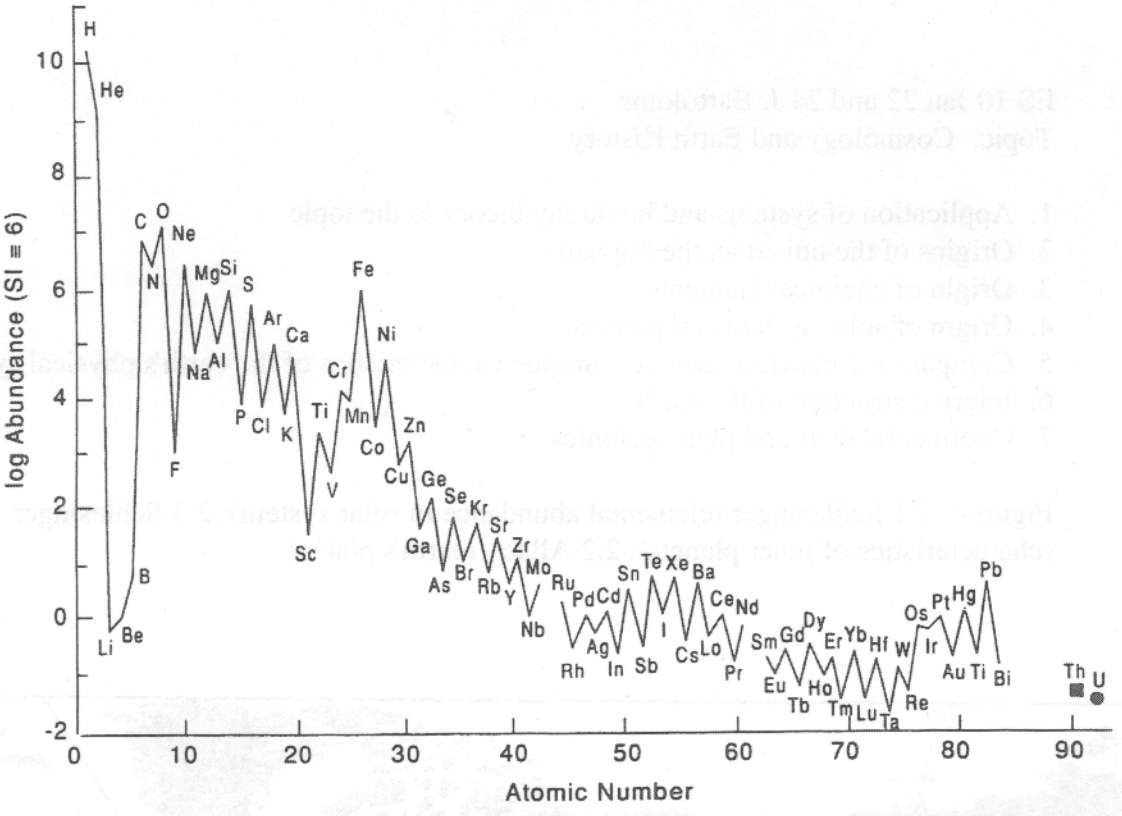

Figure 2.1 The relative abundance of elements in the solar system as a function of atomic number. Abundances are plotted logarithmically and scaled so that silicon (Si) = 1,000,000. From a drawing by Brownlee (1992) based on the data of Anders and Grevesse (1989).

Table 2.3 Some Characteristics of the Inner Planets

	Mars[a]	Earth	Venus[b]
Distance to the sun (10^6 km)	228	150	108
Surface temperature (°C)	−53	16	474
Radius (km)	3390	6371	6049
Atmospheric pressure (bars)	0.007	1	92
Atmospheric mass (g)	2.4×10^{19}	5.1×10^{21}	5.3×10^{23}
Atmospheric composition (% wt.)			
CO_2	95	0.036	98
N_2	2.5	78	2
O_2	0.25	21	0
H_2O	0.10	<1	0.05

[a] From Owen and Biemann (1976).
[b] From Nozette and Lewis (1982).