

	Title Page, Contributors, Preface	
1	The earth in the planetary system	1
1.1	Origin of the earth in the solar system (H. WÄNKE)	1
1.2	The motion of the earth (E. GROTEN)	9
1.2.0	Abbreviations, notation and units	9
1.2.1	Introduction	12
1.2.2	Units and definitions	12
1.2.3	Orbital motion of the earth	15
1.2.4	Primary parameters of the earth's rotational motion in space	18
1.2.5	Forced nutation	19
1.2.6	The rotation of the earth	25
1.2.7	Tidal dissipation	41
1.2.8	The Celestial Ephemeris Pole	42
1.2.9	Bibliography for 1.2	44
2	Properties of the solid earth	47
2.1	Seismicity and the interior of the earth	47
2.1.1	Seismicity (G. SCHNEIDER)	47
2.1.1.0	List of symbols	47
2.1.1.1	Introduction	47
2.1.1.2	Geometric and dynamic source parameters	48
2.1.1.3	Radiation pattern and source mechanisms	50
2.1.1.4	Seismic source spectrum and magnitude	50
2.1.1.5	The spatial distribution of earthquake foci	55
2.1.1.6	Seismic return period and earthquake statistics	57
2.1.1.7	Macroseismic effects	57
2.1.1.8	Earthquake prediction	59
2.1.1.9	References for 2.1.1	59
2.1.2	Seismic waves and free oscillations (G. MÜLLER, W. ZÜRN)	61
2.1.2.0	List of symbols and abbreviations	61
2.1.2.1	Body waves	62
2.1.2.2	Surface waves	71
2.1.2.3	Free oscillations	76
2.1.2.4	References for 2.1.2	82

2.1.3	Structure, elastic and rheological properties and density of the earth's interior (A.M. DZIEWONSKI, D.L. ANDERSON)	84
2.1.3.0	List of symbols	84
2.1.3.1	The Gross Earth Data Set	85
2.1.3.2	The earth model	85
2.1.3.3	References for 2.1.3	96
2.1.4	Structure of the earth's crust and upper mantle (C. PRODEHL)	97
2.1.4.1	Introduction	97
2.1.4.2	Procedure of interpretation	97
2.1.4.3	Main features of continental and oceanic crustal structure	100
2.1.4.4	Presentation of individual results	110
2.1.4.5	Main features of the structure of the lower lithosphere and asthenosphere	170
2.1.4.7	References for 2.1.4	194
2.2	Heat flow and temperature distribution in the earth's interior	207
2.2.1	Oceanic and continental heat-flow data	207
2.2.1.1	Oceanic heat flow data (R. VON HERZEN)	207
2.2.1.1.1	Introduction	207
2.2.1.1.2	Western and South Pacific	208
2.2.1.1.3	Northeast and Central Pacific	211
2.2.1.1.4	East Pacific	215
2.2.1.1.5	North Atlantic	221
2.2.1.1.6	South Atlantic	228
2.2.1.1.7	Indian Ocean	230
2.2.1.1.8	Marginal Seas	232
2.2.1.1.9	References for 2.2.1.1	240
2.2.1.2	Continental heat flow data (See Vol. 2B)	
2.2.2	Radioactive heat production in the continental crust (L. RYBACH)	242
2.2.3	Temperature profiles in the earth's interior (See Vol. 2B)	
2.2.4	Heat transport in the earth's interior (See Vol. 2B)	
2.3	Electrical properties of the earth's interior (See Vol. 2B)	
2.4	Composition of the earth's interior (I. JACKSON)	248
2.4.1	List of symbols and abbreviations	248
2.4.2	Introduction	248
2.4.3	The crust	248
2.4.4	The upper mantle	250
2.4.5	The transition zone	252
2.4.6	The lower mantle	254
2.4.7	The core	256
2.4.8	References for 2.4	257

2.5	Tides of the earth	259
2.5.0	List of symbols and abbreviations for 2.5.1 and 2.5.2	259
2.5.1	Tidal forcing field (H. WILHELM, W. ZÜRN)	261
2.5.1.1	Introduction	261
2.5.1.2	Expansion in spherical harmonics	262
2.5.1.3	Equatorial and ecliptical coordinates	265
2.5.1.4	Components	266
2.5.1.5	Astronomical variables. Time	267
2.5.1.6	Harmonic development	268
2.5.1.7	References for 2.5.1	279
2.5.2	Tides of the solid earth (W. ZÜRN, H. WILHELM)	280
2.5.2.1	Introduction	280
2.5.2.2	Body tides	280
2.5.2.3	Observations	283
2.5.2.4	Load tides	285
2.5.2.5	Systematic effects	291
2.5.2.6	Local elastic inhomogeneities	296
2.5.2.7	Meteorological effects	297
2.5.2.8	References for 2.5.2	298
2.5.3	Tidal friction and dynamics of the earth-moon-system (P. BROSCHE, J. SÜNDERMANN)	299
2.5.3.0	List of symbols and abbreviations	299
2.5.3.1	The principle	300
2.5.3.2	Observations	300
2.5.3.3	Balances of energy and angular momentum	304
2.5.3.4	Long time integration	308
2.5.3.5	Bibliography for 2.5.3	310
3	Gravity field and figure of the earth (H.-G. KAHLE)	311
3.1	Gravity potential of the earth	311
3.2	Fundamental notions of gravimetry	315
3.3	Gravimetric measuring techniques	317
3.4	Reference ellipsoid and geoid	332
3.5	Satellite geodesy and the earth's gravitational potential V	339
3.6	References for 3	351
4	Magnetic field of the earth (See Vol. 2B)	
5	Transport of masses in the earth's interior	357
5.1	Relief of the earth's surface and of the sea floor (See Vol. 2B)	
5.2	Recent crustal movements (H. MÄLZER)	357
5.2.0	List of symbols	357
5.2.1	Introduction	358
5.2.2	Measurements of deformation within plate interiors and near active plate boundaries	358

5.2.3	Measurements on a global scale	368
5.2.4	References for 5.2	374
5.3	Theories and hypotheses of global tectonics (See Vol. 2B)	
5.4	Motions in the earth's core and core-mantle coupling (F.H. BUSSE)	377
6	Planetology of terrestrial planets (R. MEISSNER, P. JANLE)	379
6.0	List of symbols and abbreviations	379
6.1	Introduction	380
6.2	Short description of the terrestrial planetary bodies	380
6.3	Absolute age determinations	383
6.4	Relative age determination	385
6.5	Geological - geophysical interpretation of surface structures	389
6.6	Gravity studies from orbiters and density models of lithospheres	392
6.7	Additional studies from orbiter, fly-by, and descend missions	399
6.8	Lunar seismology	400
6.9	Planetary magnetic fields and remanent magnetization	407
6.10	Electrical conductivity, heat flow and estimates on the lunar temperature	408
6.11	Physical conditions of the interior of planets	409
6.12	The evolution of terrestrial planets	412
6.13	References	413
	Subject index for volumes 1A, 1B and 2A, 2B (see Vol. 2B)	