

Contents

	Introduction	
	P. GIESE, C. PRODEHL, and A. STEIN	1
1	Main Geologic Features of the Federal Republic of Germany	
	V. JACOBSPATHEN	3
2	Contributions by Other Geophysical Methods	
	A. HAHN	19
2.1	Investigation of Seismic Noise in the Federal Republic of Germany	
	M. STEINWACHS	21
2.2	Magnetics	
	A. HAHN	23
2.3	Geoelectric Ultra-Deep Sounding	
	E.K. BLOHM and H. FLATHE	26
2.4	Geothermic Investigations	
	R. HÄNEL	32
2.5	Compressional and Shear Wave Velocities as a Function of Temperature in Rocks at High Pressure	
	K. FIELITZ	40
2.6	Some Petrophysical Aspects of Deep Structure	
	A. SCHULT	45
2.7	Gravity	
	S. PLAUMANN	49
3	Basic Data of the Deep-Seismic Sounding Observations	
	P. GIESE and C. PRODEHL	53
3.1	Shotpoint Data of Quarry Blasts 1958-1972	
	A. STEIN and H. SCHRÖDER	54
3.2	Seismic Signals from Quarry Blasts	
	H. BURKHARDT and R. VEES	62
3.3	Description of Profiles	
	P. GIESE, E. HINZ, C. PRODEHL, H. SCHRÖDER, and A. STEIN	73
3.4	Presentation of Record Sections	
	P. GIESE, C. PRODEHL, H. SCHRÖDER, and A. STEIN	113

3.5	Standard Equipment for Deep-Seismic Sounding H. BERCKHEMER	115
3.6	Seismic Long-Distance Observations of Quarry Blasts - Test Measurements in Western Germany H. BURKHARDT, B. BUTTKUS, F. KELLER, and R. VEES	119
3.7	Cooperation in Deep-Seismic Sounding between the Geophysical Institutes, the Geological Surveys, and the Oil Industry H. CLOSS, G. DOHR, and H. MENZEL	127
4	Problems of Evaluation of Seismic-Refracton Data for Crustal and Upper-Mantle Studies P. GIESE and C. PRODEHL	129
4.1	General Remarks on Travel Time Data and Principles of Correlation P. GIESE	130
4.2	Problems and Tasks of Data Generalization P. GIESE	137
4.3	Depth Calculation P. GIESE	146
4.4	A Seismic-Ray Tracing Method for Two-Dimensional Inhomogeneous Media H. GEBRANDE	162
4.5	Calculation of Travel Times and Ray Paths for Lateral Inhomogeneous Media M. WILL	168
4.6	Inversion of Seismic Records with the Aid of Synthetic Seismograms G. MÜLLER and K. FUCHS	178
4.7	Some Notes on Theoretical Travel Time and Amplitude Curves U. VETTER and R. MEISSNER	189
5	Main Features of Crustal Structure in Western Germany P. GIESE	195
5.1	Models of Crustal Structure and Main Wave Groups P. GIESE	196
5.2	Results of the Generalized Interpretation of the Deep-Seismic Sounding Data P. GIESE	201
5.3	An Updated Time-Term Interpretation of P_n -Data from Quarry Blasts and Explosions in Western Germany D. BAMFORD	215
5.4	The Basic Features of Crustal Structure in Relation to the Main Geological Units P. GIESE	221

6	Interpretation of Regional Seismic Data P. GIESE	243
6.1	An Interpretation of Wide-Angle Measurements in the Rhenish Massif R. MEISSNER, H. BARTELTSEN, A. GLOCKE, and W. KAMINSKI	245
6.2	Near-Vertical Reflections Recorded at the Wide-Angle Profile in the Rhenish Massif A. GLOCKE and R. MEISSNER	252
6.3	Results of a Seismic-Refraction Profile from the Hoher Meissner to the North German Plain E. HINZ, W. KAMINSKI, and A. STEIN	257
6.4	Seismic-Refraction Measurements along Two Crossing Profiles in Northern Germany and Their Interpretation by a Ray-Tracing Method K. GRUBBE	268
6.5	Seismic Results from Southwestern Germany D. EMTER	283
6.6	Results of Seismic Investigations in the Ries Crater Area (Southern Germany) G. ANGENHEISTER and J. POHL	290
6.7	Results from Deep-Seismic Sounding in the Rhine-Main Area R. MEISSNER, H. BERCKHEMER, and A. GLOCKE ...	303
6.8	Explosion-Seismology Research in the Central and Southern Rhine Graben - A Case History C. PRODEHL, J. ANSORGE, J.B. EDEL, D. EMTER, K. FUCHS, S. MUELLER, and E. PETERSCHMITT ...	313
6.9	P-Wave Velocities in the Northern Calcareous Alps Derived from Observations of Explosions in the Eschenlohe Quarry G. SCHELIGA	329
6.10	Results of a Combined Evaluation of Longitu- dinal and Transverse Waves on a Seismic Pro- file along the Northern Margin of the Alps J. ZSCHAU and K. KOSCHYK	332
6.11	Crustal Structure in Southeastern Bavaria Derived from Seismic-Refraction Measurements by Ray-Tracing Methods H. MILLER and H. GEBRANDE	339
7	Main Features of Crustal Structure in the Alps P. GIESE and C. PRODEHL	347
8	Some Aspects of Comparing Seismic and Gravi- metric Results from Selected Areas R. MEISSNER	377
8.1	Comparison of Wide-Angle Measurements in the USSR and the Federal Republic of Germany R. MEISSNER	380

8.2	Comparison of Seismic-Refracton Studies in Central Europe and the Western United States C. PRODEHL	385
8.3	Investigations on Isostatic Balance in Differ- ent Parts of Eurasia Based on Seismic and Gravity Data R. MEISSNER and U. VETTER	396
9	Acknowledgments	401
10	References	403
	Subject Index	421
	Geographical and Geological Index	425
	Appendix: Record Sections	429
	Three Maps (Inside Front Cover)	