

CONTENTS

INTRODUCTION	17
1 TOPOLOGICAL SPACES	21
1.1 From metric spaces to abstract topological spaces	21
1.1.1 A couple of examples	22
1.1.2 Euclidean space	23
1.1.3 Natural topology on metric space	23
1.1.4 Isometry of metric spaces	24
1.1.5 Abstract topological spaces, topology	25
1.1.6 Examples of topological spaces	25
1.2 Generating of topologies	27
1.2.1 Closed sets	27
1.2.2 Closure operator. Accumulation points	28
1.2.3 Interior, exterior, boundary	28
1.2.4 The lattice of topologies. Ordering	29
1.2.5 Metrization problem	30
1.2.6 Cover, subcover	30
1.2.7 Bases. Countability Axioms	30
1.2.8 Sequences in topological spaces, nets	33
1.3 Continuous maps	33
1.3.1 Continuous maps of topological spaces	34
1.3.2 Homeomorphisms	35
1.3.3 Topological invariants	36
1.4 Constructions of new topological spaces from given spaces	36
1.4.1 Projectively and inductively generated topologies	36
1.4.2 Subspace and product	37
1.4.3 Sum and quotient	38
1.4.4 The quotient topology	39
1.5 Connectedness	40
1.5.1 Path-connected spaces	40
1.5.2 Connected topological spaces	40
1.6 Separation properties	42
1.6.1 The Hausdorff separation axiom	43
1.6.2 Separation by continuous functions	44
1.6.3 Tychonoff spaces	45
1.7 Compactness	46
1.7.1 Compact topological spaces	47
1.7.2 Compactification	48
1.7.3 Local compactness	49
1.7.4 Partition of unity	49
1.7.5 Paracompactness	50

1.8 Metrization of a topological space	51
1.8.1 Metrization Theorems	51
1.8.2 Some properties of metric and metrizable spaces	52
1.8.3 Complete metric spaces	52
1.9 Topological algebraic structures	53
1.9.1 Topological groups	53
1.9.2 Topological vector spaces	55
1.10 Fundamental group	55
1.10.1 Homotopic maps	56
1.10.2 Loops	58
1.10.3 Homotopy of paths and loops	58
1.10.4 Construction of the fundamental group	59
1.11 Topological manifolds	62
1.11.1 Surfaces	62
1.11.2 Hypersurface	65
1.11.3 Topological manifold	65
1.11.4 Charts, atlas	66
1.11.5 The classification of compact connected 2-manifolds	66
2 MANIFOLDS WITH AFFINE CONNECTION	69
2.1 Differentiable manifolds	69
2.1.1 Differentiable structure (complete atlas)	69
2.1.2 Smooth map, diffeomorphism	70
2.1.3 Tangent vector, tangent space, tangent bundle	71
2.1.4 Differential map	72
2.1.5 Curve, tangent vector of a curve	73
2.1.6 Vector field, flow	74
2.1.7 Distributions	76
2.1.8 One-forms	76
2.2 Tensor fields and geometric objects	77
2.2.1 Tensors on a vector space	77
2.2.2 Tensors on manifolds	79
2.2.3 Geometric objects on manifolds	80
2.3 Manifolds with affine connection	82
2.3.1 Affine connections, manifolds with affine connection	82
2.3.2 Covariant differentiation	83
2.3.3 Curvature and Ricci tensor	84
2.3.4 Flat, Ricci flat and equiaffine manifolds	85
2.3.5 Parallel transport of vectors and tensors	86
2.3.6 Geodesics	88
2.3.7 Some remarks on definitions for geodesics	89
2.4 Special coordinate systems and reconstructions	92
2.4.1 Affine coordinates and flat manifolds	92
2.4.2 Geodesic coordinates in a point, Fermi and Riemann coordinates	92
2.4.3 Pre-semigeodesic coordinates	94
2.4.4 Reconstruction of connection	97

2.5 On systems of partial differential equations of Cauchy type	100
2.5.1 Systems of PDEs of Cauchy type in \mathbb{R}^n	100
2.5.2 On mixed systems of PDEs of Cauchy type in \mathbb{R}^n	101
2.5.3 On a mixed linear system of PDEs of Cauchy type in \mathbb{R}^n	102
2.5.4 Mixed PDEs in tensor form	102
2.5.5 On systems of PDEs of Cauchy type in manifolds	102
2.5.6 Application	104
3 RIEMANNIAN AND KÄHLER MANIFOLDS	107
3.1 Riemannian manifolds \mathbb{V}_n, i.e. Riemannian and pseudo-Riemannian manifolds	107
3.1.1 Riemannian metric	107
3.1.2 Length of vector and arc, angle and volume	109
3.1.3 Isometric diffeomorphisms	110
3.1.4 Levi-Civita connection and Riemannian tensor	110
3.1.5 Parallel transport and geodesics	112
3.2 Special Riemannian manifolds	113
3.2.1 Subspaces of Riemannian spaces	113
3.2.2 Sectional curvature and Spaces of constant curvature	114
3.2.3 Einstein spaces	115
3.2.4 Hypersurfaces	116
3.3 Special coordinates in Riemannian spaces	117
3.3.1 Normal coordinates	117
3.3.2 Coordinates generated by a system of orthogonal hypersurfaces	117
3.3.3 Semigeodesic coordinates	118
3.3.4 Reconstruction of the metric in semigeodesic coordinates	120
3.4 Variational properties in Riemannian spaces	122
3.4.1 Variational problem	122
3.4.2 Variational problem of geodesics in Riemannian spaces	123
3.4.3 Generalized variational problem for geodesics	125
3.4.4 Applications of geodesics	126
3.4.5 Isoperimetric extremals of rotation	127
3.4.6 On new equations of isoperimetric extremals of rotation	129
3.4.7 On the existence of isoperimetric extremals of rotation	131
3.5 Kähler manifolds	132
3.5.1 Definition and basic properties of Kähler manifolds	132
3.5.2 Canonical coordinates on Kähler manifolds	133
3.5.3 The operation of conjugation	135
3.5.4 Holomorphic curvature	137
3.5.5 Space of constant holomorphic curvature	137
3.5.6 Analytic vector fields	138
3.6 Equidistant spaces	140
3.6.1 Torse-forming and concircular vector fields	140
3.6.2 On differentiability of functions with special conditions	142
3.6.3 Fundamental equations of concircular vector fields for minimal differentiable conditions	143

3.6.4	A space with affine connection which admits at least two linearly independent concircular vector fields	145
3.6.5	A Riemannian space which admits at least two linearly independent concircular vector fields	147
3.6.6	Concircular and convergent vector fields on compact manifolds with affine connection	149
3.6.7	Applications of the achieved results	149
3.6.8	Equidistant manifolds and special coordinate system	150
3.6.9	Einstein equidistant manifolds and the theory of relativity	151
3.6.10	Equidistant Kähler spaces	153
3.6.11	On Sasaki spaces and equidistant Kähler manifolds	154
3.7	A five-dimensional Riemannian manifold with an irreducible $SO(3)$-structure as a model of statistical manifold	156
3.7.1	Information geometry	156
3.7.2	An abstract statistical manifold	156
3.7.3	An irreducible $SO(3)$ -structure	157
3.7.4	The model of a statistical manifold	158
3.7.5	On a conjugate symmetric statistical manifold	160
3.7.6	On a nearly integrable $SO(3)$ -structure	163
3.8	Traceless decomposition of tensors	166
3.8.1	Introduction	166
3.8.2	On decomposition of tensors on manifolds	166
3.8.3	F -traceless decomposition	171
3.8.4	Quaternionic trace decomposition	176
3.8.5	Generalized decomposition problem for Ricci and Riemannian tensors	178
3.8.6	Traceless decompositon and recurrency	179
4	MAPPINGS AND TRANSFORMATIONS OF MANIFOLDS	181
4.1	Theory of Mappings	181
4.1.1	Introduction to mappings and transformation theory	181
4.1.2	Formalism of a “common coordinate system”	181
4.1.3	Formalism of a “common manifold”	181
4.1.4	Deformation tensor of a mapping	181
4.1.5	On equations of mappings onto Riemannian manifolds	183
4.2	Transformation Lie Groups	184
4.2.1	Introduction	184
4.2.2	Transformation Groups	184
4.2.3	Continuous transformation groups. Lie groups.	185
4.2.4	One-parameter groups of continuous transformations	186
4.2.5	Lie derivative	187
4.3	Affine mappings and transformations	189
4.3.1	Affine mappings of manifolds with affine connection	189
4.3.2	Affine mappings onto Riemannian manifolds	191
4.3.3	Product manifolds and affine mappings	191
4.3.4	Affine motions	192

4.4 Isometric mappings and transformations	193
4.4.1 Fundamental equations of isometric mappings	193
4.4.2 On local isometry of spaces of constant curvature	195
4.4.3 On local isometry of spaces of constant holomorphic curvature	195
4.4.4 Groups of motions	196
4.5 Homothetic mappings and transformations	198
4.5.1 Homothetic mappings	198
4.5.2 Groups of homothetic motions	198
4.5.3 Transformation groups and special mappings	199
4.6 Metric connections, Metrization problem	201
4.6.1 Metrization according to Eisenhart and Veblen	202
4.6.2 Application to the calculus of variations	205
4.6.3 Metrization in dimension two	206
4.6.4 Metrization via holonomy groups and holonomy algebras . . .	212
4.6.5 Decision Algorithm	221
4.6.6 Metrization of connections with regular curvature	223
4.7 Harmonic diffeomorphisms and transformations	229
4.7.1 Harmonic diffeomorphisms	229
4.7.2 Harmonic transformations	230
5 CONFORMAL MAPPINGS AND TRANSFORMATIONS 235	
 5.1 Conformal and isometric mappings	235
5.1.1 Introduction to the theory of conformal and isometric mappings	235
 5.2 Main properties of conformal mappings	237
5.2.1 Fundamental equations of conformal mappings	237
5.2.2 Equivalence classes of conformal mappings	237
 5.3 Some geometric objects under conformal mappings	238
5.3.1 Christoffel symbols under conformal mappings	238
5.3.2 Riemannian and Ricci tensor under conformal mappings	239
5.3.3 Weyl tensor of conformal curvature	239
 5.4 Conformally flat manifolds	240
 5.5 Conformal mappings onto Einstein spaces	242
5.5.1 Linear equations of conformal mappings onto Einstein spaces .	242
5.5.2 On the quantity of the solution's parameters	243
5.5.3 Conformal mappings onto 4-dimensional Einstein spaces . . .	244
5.5.4 Conformal mappings from symmetric spaces onto Einstein spaces	244
5.5.5 Conformal mappings onto Einstein spaces "in the large" . . .	246
 5.6 Concircular mappings	247
5.6.1 Concircular mappings	247
5.6.2 Conformal mappings preserving the Einstein tensor	248
5.6.3 Conformal mappings between Einstein spaces	249
 5.7 Conformal transformations	250
5.7.1 Groups of conformal transformations	250
5.7.2 Criterion of conformal flatness	251
5.7.3 On the lacunarity of the degree of conformal motions	253
5.7.4 Riemannian space of second lacunarity of conformal motions	255

6 GEODESIC MAPPINGS OF MANIFOLDS WITH AFFINE CONNECTION	257
6.1 Geodesic mappings	257
6.1.1 Introduction to geodesic mappings theory	257
6.1.2 Examples of geodesic mappings	258
6.2 Fundamental properties of geodesic mappings	259
6.2.1 Levi-Civita equations of geodesic mappings	259
6.2.2 Equivalence classes of geodesic mappings	262
6.2.3 Thomas projective parameter	263
6.2.4 Manifold with projective connection	264
6.2.5 Riemannian and Ricci tensor under geodesic mappings	265
6.2.6 Weyl tensor of projective curvature	266
6.2.7 Geodesic mappings of equiaffine manifolds	267
6.3 Projectively flat manifolds	269
6.3.1 Geodesic mappings of projectively flat manifolds	269
6.3.2 Characterization of projectively flat manifolds	270
6.4 Projective transformations	272
7 GEODESIC MAPPINGS ONTO RIEMANNIAN MANIFOLDS	275
7.1 Fundamental equations of GM: $\mathbb{A}_n \rightarrow \bar{\mathbb{V}}_n$	275
7.1.1 Levi-Civita equations of geodesic mappings	275
7.1.2 Cauchy type equations of GM of \mathbb{A}_n onto $\bar{\mathbb{V}}_n$	276
7.1.3 On the mobility degree with respect to geodesic mappings	277
7.2 Linear equations of the theory of geodesic mappings	280
7.2.1 Mikeš-Berezovski equations of geodesic mappings	280
7.2.2 Linear equations of geodesic mappings $\mathbb{A}_n \rightarrow \bar{\mathbb{V}}_n$	282
7.2.3 Geodesic mappings $\mathbb{P}_n \rightarrow \bar{\mathbb{V}}_n$ for $\mathbb{P}_n \in C^2$ and $\bar{\mathbb{V}}_n \in C^1$	283
7.2.4 Example	285
7.3 Geodesic mappings of special manifolds	286
7.3.1 Geodesic mappings of semisymmetric manifolds	286
7.3.2 Geodesic mappings of generalized recurrent manifolds	292
8 GEODESIC MAPPINGS BETWEEN RIEMANNIAN MANIFOLDS	297
8.1 General results on geodesic mappings between \mathbb{V}_n	297
8.1.1 Levi-Civita and Sinyukov equations of geodesic mappings	297
8.1.2 Sinyukov Γ -transformations of geodesic mappings	298
8.2 Classical examples of geodesic mappings	299
8.2.1 Lagrange and Beltrami projections	299
8.2.2 Dimension two	299
8.2.3 Levi-Civita metrics	300
8.3 Geodesic mappings and equidistant spaces	301
8.4 Manifolds $\mathbb{V}_n(B)$	303
8.4.1 Geodesic mappings of $\mathbb{V}_n(B)$ spaces	303
8.4.2 Properties of the spaces $\mathbb{V}_n(B)$	305

8.4.3	Projective transformations and manifolds $\mathbb{V}_n(B)$	306
8.4.4	Geodesically complete manifolds $\mathbb{V}_n(B)$	308
8.5	GM and its field of symmetric linear endomorphisms	311
8.5.1	Geodesic mappings in terms of linear algebra	311
8.5.2	GM of complete noncompact Riemannian manifolds	315
9	GEODESIC MAPPINGS	
OF SPECIAL RIEMANNIAN MANIFOLDS		317
9.1	Geodesic mappings of spaces of constant curvature	317
9.1.1	Spaces of constant curvature	317
9.1.2	Geodesic mappings of spaces of constant curvature	318
9.2	Geodesic mappings of Einstein spaces	320
9.2.1	Einstein spaces are closed under geodesic mappings	320
9.2.2	Einstein spaces admit projective transformations	320
9.2.3	Metrics of Einstein manifolds admitting geodesic mappings	321
9.2.4	Local structure Theorem	323
9.2.5	Geodesic mappings of four-dimensional Einstein spaces	326
9.2.6	Petrov's conjecture on geodesic mappings of Einstein spaces	327
9.3	Geodesic mappings of pseudo-symmetric manifolds	328
9.3.1	T -pseudo-symmetric manifolds	328
9.3.2	Geodesic mappings of c_i - and c_{ij} -pseudosymmetric \mathbb{V}_n	330
9.3.3	Geodesic mappings of T -pseudosymmetric manifolds	332
9.4	Generalized symmetric, recurrent and semisymmetric \mathbb{V}_n	335
9.4.1	GM of semisymmetric spaces and their generalizations	336
9.4.2	Geodesic mappings of spaces with harmonic curvature	338
9.5	Geodesic mappings of Kähler manifolds	340
9.5.1	Introduction	340
9.5.2	GM of \mathbb{K}_n which preserve the structure tensor	340
9.5.3	Geodesic mappings onto Kähler manifolds	341
9.5.4	Geodesic mappings between Kähler manifolds	342
10	GLOBAL GEODESIC MAPPINGS AND DEFORMATIONS	345
10.1	On the theory of geodesic mappings of Riemannian manifolds "in the large"	345
10.1.1	GM between Riemannian manifolds of different dimensions	346
10.1.2	Geodesic immersions	348
10.1.3	Geodesic submersions	348
10.2	Projective transformations and deformation of surfaces	350
10.2.1	Global projective transformation of n -sphere	350
10.2.2	Surface of revolution	353
10.2.3	On global geodesic mappings of ellipsoids	356
10.2.4	Compact orientable spaces L_n	360
10.2.5	Global geodesic mappings \mathbb{V}_n onto $\bar{\mathbb{V}}_n$ with boundary	360
10.2.6	GM and principal orthonormal basis	361
10.3	On geodesic mappings with certain initial conditions	362
10.3.1	On geodesic mappings with certain initial conditions	362

10.3.2	The first quadratic integral of a geodesic	364
10.3.3	On first quadratic integral of geodesics with initial conditions	365
10.4	Geodesic deformations of hypersurfaces in Riemannian spaces	366
10.4.1	Infinitesimal deformations of Riemannian spaces	366
10.4.2	Geodesic deformations and geodesic maps	368
10.4.3	Geodesic deformations of subspaces of Riemannian spaces . .	369
10.4.4	Basic equations of geodesic deformations of hypersurfaces . .	369
10.4.5	A system of equations of Cauchy type for geodesic deformations of a hypersurface	371
11	APPLICATIONS OF GEODESIC MAPPINGS	375
11.1	Applications of geodesic mappings to general relativity	375
11.1.1	Agreement on terminology	375
11.1.2	Killing-Yano tensors	375
11.1.3	Geodesic mappings and integrals of the Killing-Yano equations	376
11.1.4	Closed conformal Killing-Yano tensors	376
11.1.5	Conformal Killing-Yano tensors	378
11.1.6	The pre-Maxwell equations	379
11.1.7	Operators of symmetries of Dirac equations	380
11.2	Three invariant classes of the Einstein equations and geodesic mappings	381
11.2.1	The Einstein equations	381
11.2.2	Invariantly defined seven classes of the Einstein equations . .	381
11.2.3	Einstein like manifolds of Killing type	381
11.2.4	Einstein like manifolds of Codazzi type	382
11.2.5	The class of Einstein like manifolds of Sinyukov type	383
12	F-PLANAR MAPPINGS AND TRANSFORMATIONS	385
12.1	On F-planar mappings of spaces with affine connections	385
12.1.1	Definitions of F -planar curves and F -planar mappings	385
12.1.2	Preliminary lemmas of linear and bilinear forms and operators	387
12.1.3	F -planar mappings which preserve F -structures	390
12.1.4	F -planar mappings which do not preserve F -structures	391
12.1.5	F -planar mappings for dimension $n = 2$	392
12.1.6	F -planar mappings with covariantly constant structure	392
12.2	F-planar mappings onto Riemannian manifolds	394
12.2.1	Fundamental equations of F -planar mappings onto \mathbb{V}_n	394
12.2.2	Equations of F -planar mappings in Cauchy form	394
12.2.3	Special F -planar mappings onto Riemannian manifolds	398
12.2.4	Fundamental equations of F_1 -planar mappings	399
12.2.5	Fundamental linear equations of F_2 -planar mappings	402
12.2.6	Generating F -planar mappings	404
12.3	Infinitesimal F-planar transformations	405
12.3.1	Definition of infinitesimal F -planar transformations	405
12.3.2	Basic equations of infinitesimal F -planar transformations . .	405

12.4 F-planar transformations	408
12.5 On F_2^ε-planar mappings of Riemannian manifolds	412
12.5.1 PQ^ε -projective Riemannian manifolds	412
12.5.2 Simplification of conditions (12.72) for $\varepsilon \neq 0$	413
12.5.3 F_2^ε -projective mapping with $\varepsilon \neq 0$	413
12.5.4 F_2^ε -planar mappings with the $\bar{g} = k \cdot g$ condition	415
13 HOLOMORPHICALLY PROJECTIVE MAPPINGS OF KÄHLER MANIFOLDS	417
13.1 Fundamental properties of HP mappings	418
13.1.1 Definition of holomorphically projective mappings	418
13.1.2 Equivalence classes of holomorphically projective mappings .	420
13.1.3 Some geometric objects under HPM	420
13.1.4 Holomorphically projectively flat Kähler manifolds	421
13.2 Fundamental theorems of the theory of HP mappings	424
13.2.1 Linear fundamental equations of the theory of HPM	424
13.2.2 The first quadratic integral of geodesics and HP mappings .	425
13.2.3 Fundamental equations of HPM in Cauchy form	426
13.2.4 Integrability conditions of fundamental equations of HPM .	428
13.2.5 Reduction of fundamental equations of HP mappings	429
13.2.6 HP mappings of generalized recurrent Kähler manifolds .	430
13.2.7 HP mappings with certain initial conditions	431
13.3 Manifolds $\mathbb{K}_n[B]$	432
13.3.1 Holomorphically projective mappings of $\mathbb{K}_n[B]$ spaces	432
13.3.2 Properties of the spaces $\mathbb{K}_n[B]$	434
13.3.3 On the degree of mobility of \mathbb{K}_n relative to HPM	434
13.3.4 HP transformations and manifolds $\mathbb{K}_n[B]$	435
13.3.5 K -concircular vector fields and HPM	437
13.3.6 Holomorphically complete manifolds $\mathbb{K}_n[B]$	437
13.4 HPM of special Kähler manifolds	439
13.4.1 HPM of T-k-pseudosymmetric Kähler manifolds	439
13.4.2 HPM of Einstein spaces and of their generalizations	441
13.4.3 Spaces that locally do not admit nontrivial HPM	442
13.5 HP mappings of parabolic Kähler spaces $\mathbb{K}_n^{o(m)}$	443
13.5.1 HP mappings theory for $\mathbb{K}_n^{o(m)} \rightarrow \bar{\mathbb{K}}_n^{o(\bar{m})}$	443
13.5.2 HP mappings of parabolic Kähler space of class C^2	446
13.5.3 HP mappings $\mathbb{K}_n^{o(m)} \rightarrow \bar{\mathbb{K}}_n^{o(\bar{m})}$ for $\mathbb{K}_n^{o(m)} \in C^r$ and $\bar{\mathbb{K}}_n^{o(\bar{m})} \in C^2$.	447
13.5.4 Holomorphically projective flat parabolic Kähler spaces . . .	449
13.5.5 On isometries between holomorphically-projective flat $\mathbb{K}_n^{o(m)}$.	450
13.5.6 HP mappings of holomorphically-projective flat $\mathbb{K}_n^{o(m)}$	451
13.5.7 Metric of holomorphically-projective flat $\mathbb{K}_n^{o(m)}$	452

14 ALMOST GEODESIC MAPPINGS	455
14.1 Almost geodesic mappings	455
14.1.1 Almost geodesic curves	455
14.1.2 Almost geodesic mappings, basic definitions	457
14.1.3 On a classification of almost geodesic mappings	459
14.1.4 On a completeness classification of almost geodesic mappings	461
14.2 Almost geodesic mappings of type π_1	463
14.2.1 Canonical almost geodesic mappings $\tilde{\pi}_1$	463
14.2.2 Properties of the fundamental equations of $\tilde{\pi}_1$	464
14.2.3 Canonical almost geodesic mappings $\tilde{\pi}_1$ onto Riemannian spaces	466
14.2.4 Ricci-symmetric and generalized Ricci-symmetric spaces . . .	469
14.2.5 AG mappings $\tilde{\pi}_1$ onto generalized Ricci-symmetric manifolds	470
14.3 π_1 mappings preserving n-orthogonal hypersurfaces	473
14.3.1 Mappings of \mathbb{V}_n preserving a system n -orthogonal hypersurfaces	473
14.3.2 Special almost geodesic mappings of the type π_1	474
14.4 On special almost geodesic mappings of type π_1 of \mathbb{A}_n	477
14.4.1 Almost geodesic mappings π_1^*	477
14.4.2 An invariant object of mappings π_1^*	478
14.4.3 Mappings π_1^* of affine and projective-euclidean spaces	479
14.4.4 Examples of almost geodesic mappings π_1^*	480
15 RIEMANN-FINSLER SPACES	481
15.1 Riemann-Finsler spaces	481
15.1.1 Douglas spaces, Previous results	485
15.1.2 Douglas spaces	486
15.1.3 A generalization of Douglas spaces	492
15.2 Riemann-Finsler spaces with h-curvature tensor	493
15.2.1 Projective invariants	493
15.2.2 Q^3 -invariants	495
15.2.3 Behaviour of the Weyl tensor in Douglas spaces	496
15.2.4 On the rectifiability condition of a second ordinary differential equation	497
15.3 Riemann-Finsler spaces with h-curvature (Berwald curvature) tensor dependent on position alone	499
15.4 Projective changes between Riemann-Finsler spaces with (α, β)-metric	502
15.4.1 Preliminaries	502
15.4.2 The two-dimensional case	506
15.5 Geodesic mappings of weakly Berwald spaces and Berwald spaces onto Riemannian spaces (\mathbb{V}_n)	509
15.5.1 Geodesic mappings of weakly Berwald spaces onto \mathbb{V}_n	509
15.5.2 Geodesic mappings of Berwald spaces onto \mathbb{V}_n	510
15.5.3 Riemannian metrics having common geodesics with a Berwald metric	511

BIBLIOGRAPHY	513
Monographs and surveys	513
T h e s e s	519
P a p e r s	521
SUBJECT INDEX	547
NAME INDEX	557
AUTHORS	565