

# CONTENTS

<b>1</b>	<b>Basics, Goals, and Tasks</b>	<b>1</b>	
<b>2</b>	<b>Physical and Mechanical Fundamentals of Boat Propulsion</b>		<b>7</b>
2.1	Displacement	7	
2.2	Stability	7	
2.3	Resistance Factors	8	
2.3.1	Hull Resistance	8	
2.3.2	Skin Resistance	9	
2.3.3	Pitch Resistance	10	
2.3.4	Changes in Resistance with Increasing Speed	11	
2.4	Effect of the Water Depth	11	
2.5	Speed Behaviour during the Stroke	12	
2.5.1	Average Boat Speed	13	
2.5.2	Changes in Speed during the Stroke	13	
2.5.3	Propulsion Variants	17	
2.6	Laws of Leverage	17	
2.6.1	Stationary Observation of Power Transfer	19	
2.6.2	The Action of Power on the Inboard Lever	19	
2.6.3	Dynamic Observation of Power Transmission - Slippage	20	
2.6.4	Negative Slippage	21	
2.6.5	Advantages and Disadvantages of the Wide Blade	21	
2.7	Transmission Ratios	22	
2.8	"Italian" Rigger Layout	24	
2.9	Time Factors in Propulsion	25	
2.9.1	Assessment of the Stroke Frequency	25	
2.9.2	Rhythm Ratio	27	
2.10	Steering	28	
<b>3</b>	<b>Equipment</b>	<b>30</b>	
3.1	Boat Types and Classes	30	
3.2	Boat Construction - Basics	31	
3.2.1	Boat Design Plans	31	
3.2.2	Characteristics of Gigs and Racing Boats	32	
3.2.3	Rib Shapes	33	
3.3	Materials	34	
3.4	Boat Construction Methods	35	
3.4.1	Clinker Construction	53	

- 3.4.2 Shell Construction 36
- 3.5 Boat Weight, Boat Dimensions, Quality Stages 38
- 3.6 Longitudinal Stability 39
- 3.7 The Rowing Work 40
  - 3.7.1 Slideway and Sliding Seat 40
  - 3.7.2 Stretcher 42
  - 3.7.3 Riggers 42
  - 3.7.4 Oarlocks 44
- 3.8 Rudder and Rudder Position 47
- 3.9 Oars and Sculls 48
- 3.10 Ordering of Boats, Oars, and Sculls 52
- 3.11 Rules for Maintenance and Storage of Boats and Equipment 53
- 3.12 Launching Docks 54
- 3.13 Rowing Tanks, Land Rowing Apparatus, Training Areas 54
- 3.14 Motor Boats 55
- 3.15 Boat Transport 55

**4 Rigging 57**

- 4.1 Depth of Immersion and Freeboard 58
- 4.2 Seating Layout 58
- 4.3 Foot Stretcher Adjustment 59
- 4.4 The Height of Work 61
- 4.5 Adjustment of the Transmission Ratio (gearing) 62
- 4.6 Pitch 64
- 4.7 Pendular Measurement of the Oar 65
- 4.8 Rigging of Sculling Boats 65

**5 The Technique of Sculling and Sweep Oar Rowing 67**

- 5.1 The Structure of Oar Movement 68
- 5.2 What is Meant by Rhythm? 69
- 5.3 Technique and Performance 70
- 5.4 The Technique of Sculling 72
  - 5.4.1 Scull Handling 72
  - 5.4.2 Entry/Catch 73
  - 5.4.3 Pull/Drive 74
  - 5.4.4 Extraction of the Blades 77
  - 5.4.5 Slide Forward 78
  - 5.4.6 Holding of Straight Course 79
  - 5.4.7 Principal Criteria of Appropriate Technique 79
- 5.5 The Technique of Sweep or Oar Rowing 80
  - 5.5.1 Oar Handling 80
  - 5.5.2 Pull 81
  - 5.5.3 Some Reference Points on Training in Technique 81
- 5.6 Starting Techniques 82
- 5.7 Technique and Breathing 83
- 5.8 Balance 84

<b>6</b>	<b>Methodology of Training Beginners</b>	<b>86</b>
6.1	Basic Principles	86
6.2	Learning Methods	88
6.3	Learning Stages	90
6.3.1	First Learning Stage	91
6.3.1.1	Familiarization with the Rowing Equipment	91
6.3.1.2	Getting in and out; Preparatory Skills	93
6.3.1.3	Sculling with Squared Blades and Stopping	94
6.3.1.4	Sculling with Turning of the Blade	96
6.3.1.5	Further Boat Maneuvers	99
6.3.2	Second Learning Stage	100
6.3.3	Third Learning Stage	101
6.3.4	Fourth Learning Stage	103
<b>7</b>	<b>Trek Rowing</b>	<b>104</b>
7.1	Touring Competitions	104
7.2	What is the Significance of Trek Rowing?	105
7.3	General Hints on Preparation	106
7.3.1	Choice of Boat	106
7.3.2	Equipment	107
7.4	Immediate Preparation Before the Trek	107
7.4.1	Loading the Boat	108
7.4.2	Organizational Hints	108
7.5	Structuring of Leisure Time	109
<b>8</b>	<b>Rowing Commands</b>	<b>111</b>
<b>9</b>	<b>Cox Training</b>	<b>113</b>
9.1	Basic Training	113
9.2	The Coxswain's Examination	114
9.3	Behaviour in Special Cases	115
9.4	Prerequisites and Responsibilities of Racing Cox	115
<b>10</b>	<b>Extract from the Sporting Boat Regulations</b>	<b>117</b>
<b>11</b>	<b>Training the Racing Oarsmen</b>	<b>119</b>
11.1	Educational Process in Training and Competition	119
11.2	Basic Values of Competitive Performance	125
11.3	Constitution and Age	127
<b>12</b>	<b>Training Load</b>	<b>128</b>
12.1	Degree of Load	129
12.2	Objective Directions of Load	131

12.3	Systematic Increasing of Load	132
12.4	Whole Year Load	134
12.5	Load Rhythm	135
12.5.1	Micro Cycles	135
12.5.2	Meso Cycles	135
12.5.3	Active Recovery	136
12.6	Individual Training	137
12.7	Disturbances in the Development of the Training Condition	138
<b>13</b>	<b>Endurance Training</b>	<b>141</b>
13.1	Physiological Introduction	141
13.1.1	Significance and Limiting Factors of Basic Endurance	142
13.1.2	Significance and Limiting Factors of Speed Endurance	143
13.1.3	Strength Endurance	143
13.2	Aspects of Training Methodology	144
13.3	The Methods of Endurance Training	145
13.3.1	The Continuous Method	147
13.3.2	The Alternating Method	147
13.3.3	The Repetition Method	150
13.3.4	The Interval Method	150
13.3.5	The Control and Competition Method	152
13.4	The Build-up of Endurance Training Within the Annual Cycle	153
13.4.1	Basic Principles	153
13.4.2	Endurance Training in the Preparation Period	154
13.4.3	Endurance Training During Competition Period	156
13.5	Checking Endurance	157
13.5.1	Checking Basic Endurance	158
13.5.2	Control and Judgement of Specific Competitive Endurance	158
13.5.3	Control and Judgement of Speed Endurance	159
<b>14</b>	<b>Speed Training</b>	<b>160</b>
<b>15</b>	<b>Strength Training</b>	<b>162</b>
15.1	Physiological and Anatomical Remarks	162
15.1.2	The Role of Muscle Co-ordination	163
15.1.3	Maximum Strength, Speed Strength, Strength Endurance	164
15.2	Isotonic Strength Training	165
15.3	Principal Exercises for Development of Strength	166
15.3.1	Exercises with the Free Weights	166
15.3.2	Further Strength Exercises with and on Equipment	168
15.3.3	Special Strength Training in the Rowing Boat	169
15.4	Loading in Strength Training	170
15.4.1	Development of Strength Endurance	170
15.4.2	Loads for Accentuated Maximum Strength Development During Strength Endurance Training	171
15.4.3	Maximum Strength Training	171
15.5	Development of Training Principles	172

15.5.1	Warm-up Period	172
15.5.2	Core Period	172
15.6	Judgement of Strength Performance	174
15.7	Frequency of Strength Training	176
15.8	Strength Training for Women	176
<b>16</b>	<b>Supplementary Exercises for Enhancing Flexibility and Agility in Rowing and Strength Training</b>	<b>178</b>
16.1	Gymnastics	179
16.2	Games	179
16.3	Running and Cross-country Skiing	180
16.4	Swimming	180
<b>17</b>	<b>Planning Training</b>	<b>182</b>
17.1	Prerequisites for Planning	182
17.2	Principal Content of Plans	183
17.3	Planning the Entire Training Process	183
17.3.1	Children	184
17.3.2	Youths	184
17.3.3	Juniors	184
17.3.4	High Performance Training	184
17.4	Planning the Year's Training	185
17.5	Tasks and Content of the Individual Periods	185
17.5.1	Preparation Period	185
17.5.1.1	First Section	186
17.5.1.2	Second Section	186
17.5.1.3	Third Section	186
17.5.2	Competition Period (two sections)	187
17.5.3	Holiday (active recovery)	187
17.6	Evaluation Data	188
17.6.1	The Training Record	188
17.6.2	The Sportsman's Diary	188
17.6.3	The Coach's Training Diary	189
<b>18</b>	<b>Training with Children and Youths</b>	<b>190</b>
18.1	Recruitment, Testing, Selection of Talent	190
18.2	Training Load for Youths	192
<b>19</b>	<b>Preparation and Planning for Competition</b>	<b>195</b>
19.1	The Importance of Competition	195
19.2	Load Before Competition	195
19.3	Preparation Immediately Before the Start	197
19.4	Rowing on after Passing the Finishing Line	198

<b>20</b>	<b>Tactics</b>	<b>199</b>
20.1	Offensive or Spring Tactics	200
20.2	Final Spurt Tactics	200
20.3	Alternating Tactics	201
20.4	Time Plan Tactics	201
20.5	Tactical Preparation	202
<b>21</b>	<b>Evaluation of Competitions</b>	<b>204</b>
21.1	Race Factor	204
21.2	Time Relationships	207
21.3	Judgement of Performance Density and Winner's Performance	209
<b>22</b>	<b>Regatta Layouts and Competition Regulations</b>	<b>210</b>
22.1	FISA Competition System	210
22.2	GDR Competition Regulations	213
22.3	Brief History of the Sport of Rowing	216
<b>23</b>	<b>Appendix - Statistics</b>	
23.1	Olympic Regattas	220
23.2	European Championships for Men	223
23.3	European Championships for Women	227
23.4	World Championships	231
<b>24</b>	<b>Bibliography</b>	<b>233</b>