# MAN and MOVEMENT:

Principles of Physical Education



HAROLD M. BARROW JANIE P. BROWN

# MAN and MOVEMENT: Principles of Physical Education

#### HAROLD M. BARROW, P.E.D.

Emeritus Professor of Physical Education Wake Forest University Winston-Salem, North Carolina

JANIE P. BROWN, Ed.D.

Professor of Physical Education Elon College Elon College, North Carolina

FOURTH EDITION



Lea & Febiger 600 Washington Square Philadelphia, PA 19106-4198 (215) 922-1330

> Cover photograph: Seal American Association of Physical Education by R. Tait McKenzie. Lloyd P. Jones Gallery, University of Pennsylvania. Photo by Frank Ross.

FIRST EDITION, 1971 Reprinted March, 1973 Reprinted May, 1976 SECOND EDITION, 1977 THIRD EDITION, 1983 FOURTH EDITION, 1988

#### Library of Congress Cataloging-in-Publication Data

Barrow, Harold Marion, 1909-

Man and movement: principles of physical education / Harold M. Barrow, Janie P. Brown.-4th ed.

p. cm.

Includes bibliographies and index.

ISBN 0-8121-1149-4

1. Physical education and training. 2. Human mechanics. 3. Motor learning. 4. Sports—Social aspects. 5. Professionalism in sports. I. Brown, Janie P. II. Title. GV342.B36 1988

613.7'1-dc 19

88-9451

CIP

Copyright © 1988 by Lea & Febiger. Copyright under the International Copyright Union. All Rights Reserved. This book is protected by copyright. No part of it may be reproduced in any manner or by any means without written permission from the publisher.

PRINTED IN THE UNITED STATES OF AMERICA

Print number: 5 4 3 2 1

#### **Preface**

The chief purpose of this fourth edition, as with previous editions, is to introduce the aspiring professional student to the field of physical education and sport and its related areas. Cultural events and elements have a direct impact on society and bring about social changes. In most disciplines, these changes have led to fragmentation and accompanying specialization into subfields. This new edition has been geared to reflect many of these conditions and the ways in which they impact on all disciplines of study and professions.

Since physical education is a profession within the framework of an emerging discipline, it, too, is much more complex than before, because its scope is not only cross-disciplinary but also interdisciplinary. Its principles and generalizations are gleaned from data encompassing wide parameters of human learning and experience. Therefore, an introductory approach must focus attention on basic information from this extensive area as a whole, as well as emphasize the synthesis and integration of individual parts to present a meaningful and coherent picture of "What is this field of physical education?"

The profession recognizes the importance of good leadership, and good leadership starts with the emerging professional having a thorough introduction to the whole field. Therefore, introductory courses should encompass some basic knowledge from the various subdisciplines that make up the field, synthesized into an integrated and meaningful whole that has willed, purposive human movement as its central focus. This "whole" is the profession/discipline of physical education, and it is "an entity"—an indivisible entity—that cannot be separated and presented in a fragmented manner without losing its real essence. In-depth specialization in both the profession and the discipline is necessary; however, this must not come too early in the professional preparation program, but should follow a basic orientation to the whole field. Consequently, all major facets are briefly presented to reveal not only their individual significance, but also their inter-relationships with each other and their relationship to the total field. We recognize that specialization into subdisciplines is inevitable and ultimately necessary in a pluralistic world. That, however, is the function of more advanced courses using highly specialized textbooks.

The title of the book, "Man and Movement," has been retained in this edition. We emphasize that the word "man" is a direct translation from the Latin word "homo," meaning the human species today and its close ancestors of the past. Viewed in this light then, the word refers to both male and female and should not be viewed as sexist. Moreover, the first edition (1971) was honored by Pi Lambda Theta as one of the most outstanding of the 952 books copyrighted in the years 1970 and 1971 and was included in the comprehensive Education Book List. The continued use of this title provides a viable association between the first and fourth editions.

To achieve our goal of introducing the emerging professional student to the whole field of physical education in an integrative manner, the content has been structured on a continuum, with the focus on the student's evolving understanding of the parts. It is divided into seven sections; the first unit is prefatory, placing emphasis on the nature and meaning of physical education as it fits into the matrices of education, culture, and society. The strategy in this unit is to confront the student with the broad concepts that provide the foundations for the profession

viii Preface

and the significance of the discipline. The meaning and nature of the principles and the goals of the physical educator are discussed. Although physical education is not only an education of human movement but also occurs "through" human movement, that MOVEMENT becomes the central focus and overriding theme of the remaining portions of this book. Chapter 4 is an overview of human movement and emphasizes the concept that physical education can make its contribution to society, education, and the individual only through this medium. Therefore the emerging professional student should understand human movement in all of its multifaceted aspects.

The next four sections provide understanding and insight into the following areas: (1) the humanistic foundations, with the emphasis on the history and philosophy to reveal some of the past, understand the present, and project the future; (2) the biological foundations, with a brief overview of anatomy, physiology, biology, human growth and development, health, and fitness to reveal the nature of humankind; (3) the psychosocial foundations, emphasized through sociology, anthropology, and psychology to show human movement in its cultural, social, and psychological dimensions; and (4) human physical performance itself, seen through motor learning, exercise physiology, and biomechanics to reveal the limitations, as well as the potential, of human movement.

These four areas of humanistic and scientific concepts furnish the basis for the unified concept of humankind. They involve not only cognitive and psychomotor behavior, but also affective behavior, with its emphasis on human values. Values are discussed here in some detail because they are generally by-passed in other professional courses. Sport not only involves human movement, it also reflects society's values. Therefore, the role of sport in education and society is presented as revealed in R. Tait McKenzie's "Joy of Effort" and many other of his sculptures pictured throughout these pages.

The last section provides an orientation into the profession. Professionalism becomes a necessary requisite for successful and rewarding experiences. This unit defines the place of a profession in a discipline and deals specifically with the criteria of a profession and the competencies needed by the leadership in that profession. It further deals with the many career opportunities now emerging throughout the profession and discipline.

This publication has offered the co-authors an opportunity once again to interact about the multiple parameters of human movement, but at a new level. (Barrow was the mentor of Brown while she was an undergraduate at Wake Forest University.) This admixture of former and current experiences in professional problems has provided inspiring exchanges and has permitted this book to hold firmly to its theoretical heritage while adding insight into the current practices, thoughts, and research. We both share the legacy of countless professional relationships from which we have received instruction, guidance, support, friendships, and inspiration. We wish to acknowledge our indebtedness not only to those who have been given credit in the references, but to the many others who have influenced our thinking, philosophy and behavior, and have inspired our commitment.

Credit is given to Dr. David Miller, University of North Carolina, Wilmington, for his revision of Chapters 13 and 15, to Dr. Tommy Boone, University of Southern Mississippi, for his assistance with Chapter 16, and to Kyle Wills, Elon College, for the art work. Also, appreciation is expressed to the Lloyd P. Jones Gallery, Gimbel Gymnasium at the University of Pennsylvania, and to photographer, Frank Ross, of Ocean City, New Jersey, for the use of the photographs of the many R. Tait McKenzie sculptures reproduced in these pages and on the front cover.

Winston-Salem, NC Harold M. Barrow Elon College, NC Janie P. Brown

### Contents

#### PART I. INTRODUCTION TO PHYSICAL EDUCATION

Chapter 1.	SOCIETY, EDUCATION, AND PHYSICAL EDUCATION  INTRODUCTION  EDUCATION AND SOCIETY  Perpetuation of Cultural Heritage  Adjustment to Cultural Heritage.  Discovery of New Values  IMPERATIVES FACING EDUCATION AND SOCIETY.  The Search for a Greater Unity in Education	3 3 4 4 5 6 6 6
	Shaping the Future The Rise of a Global Perspective Another Fitness Crusade Impact of the Ecological and Space Curtailment Problems of a Technocratic Society Perpetuation of Democracy Humanism and Physical Education	8 10 11 13 14 15
	A New Ethic of Commitment THE EDUCATION CYCLE. The Product. The Process Evaluation REFERENCES.	18 20 20 20 21 21
Chapter 2.	NATURE AND MEANING OF PHYSICAL EDUCATION INTRODUCTION THE NATURE OF EDUCATION THE NATURE OF PHYSICAL EDUCATION Physical Education as a Body of Knowledge Physical Education as an Academic Discipline Physical Education as a Curriculum Physical Education as a Profession. CONCEPTS BASIC TO THE NATURE AND MEANING OF PHYSICAL EDUCATION The Unitary Aspect of Humankind Permanance of the Nature of Humankind	23 24 24 24 25 27 28 31 31
	Changed Way of Life	32 33 34 36 38

X Contents

	BY ANY OTHER NAME	40
	REFERENCES	40
Chapter 3.	PHYSICAL EDUCATION—PRINCIPLES, AIMS, AND	
	OBJECTIVES	43
	INTRODUCTION	43
	DEFINITIONS	43
	Principles	44
	Goals	44
	Aims	44
	Objectives	45
	SOURCES	45
	FUNCTIONS OF PRINCIPLES	46
	APPLICATION OF PRINCIPLES.	46
	RELATIONSHIP OF PRINCIPLES AND GOALS	47
	AIMS AND OBJECTIVES OF EDUCATION	48
	AIMS AND OBJECTIVES OF PHYSICAL EDUCATION	49
	Categories of Objectives	49
	Psychomotor Domain Including Motor Skills and Fitness	50
	Cognitive Domain	50
	Affective Domain	
		51
	Summary of Domains and Objectives	52
	Specific Objectives	52
	REFERENCES	52
Chapter 4.	PHYSICAL EDUCATION—ITS CENTRAL FOCUS	55
	INTRODUCTION	55
	WHAT IS A SKILL?	55
	SPECIFIC SKILL	56
	VALUE OF SKILL	57
	SUMMARY OF THE NEXT CHAPTERS	58
	REFERENCES	59
PART	Γ II. PHYSICAL EDUCATION—ITS HUMANISTIC FOUNDATION	
Chapter 5.	HISTORICAL INTERPRETATIONS OF PHYSICAL	
-	EDUCATION	63
	INTRODUCTION	63
	IMPORTANCE OF HISTORY	63
	PHYSICAL EDUCATION AMONG PRIMITIVE PEOPLE	64
	PHYSICAL EDUCATION IN ANCIENT NATIONS	65
	PHYSICAL EDUCATION IN GREECE.	66
	PHSYICAL EDUCATION IN ROME.	68
	PHYSICAL EDUCATION DURING THE DARK AGES	70
	PHYSICAL EDUCATION IN THE MIDDLE AGES	70
	Asceticism	70
	Scholasticism	70 71

Contents Xi

	Feudalism and Chivalry	71
	PHYSICAL EDUCATION DURING THE RENAISSANCE	72
	Humanism	72
	Realism	72
	EUROPEAN BACKGROUND FOR MODERN PHYSICAL	
	EDUCATION	73
	Nationalism	73
	Germany	74
	Sweden	75
	Denmark 7	75
	England	76
	•	76
	Colonial Period	76
	Nationalism—1776–1820	76
	The Evolving Systems—1820–1850	77
		78
		78
		81
	A Trilogy of Great Leaders	81
	New Developments in Teacher Education, Health, Recreation,	
		83
		84
		84
	or comment. The comment of the comme	84
		85
		86
		86
		86
		86
		87
		B7
		88
		88
		90
		90
	THOMORE OF THE TOO	91
		93
Chapter 6.	PHYSICAL EDUCATION—ITS PHILOSOPHICAL BASES 9	97
_		97
	COMPONENTS OF PHILOSOPHY 9	99
	Metaphysics 9	99
		99
		99
	Logic	
	Ethics	
	Esthetics	
	TRADITIONAL PHILOSOPHIES	
	IDEALISM 10	

xii Contents

	Idealism in Education	101
	Realism	102
	Realism in Education	103
	Pragmatism	103
	Pragmatism in Education	104
	Existentialism	104
	Existentialism in Education	105
	EDUCATIONAL PHILOSOPHIES.	106
	Progressivism	106
	Perennialism	107
	Essentialism	
		108
	Reconstructionism	108
	Perceptual-Humanistic-Psychological Approach	109
	IMPLICATIONS OF PHILOSOPHY FOR PHYSICAL	
	EDUCATION	110
	REFERENCES	111
-	DELLE BUNGLOLL DRUGLENON MEGGOVENIMANIO	
PA	RT III. PHYSICAL EDUCATION—ITS SCIENTIFIC	
	FOUNDATIONS	
Chapter 7.	BIOLOGICAL BASES OF HUMAN MOVEMENT	
	INTRODUCTION	115
	THE BIOLOGICAL BASIS OF LIFE	116
	BIOLOGICAL WEAKNESSES	117
	Lack of Fitness	117
	Low Skill Levels	118
	Prevalence of Hypokinetic Diseases	118
	Prevalence of Mental Disorders	119
	Malnutrition	119
	REFERENCES	120
Chapter 8.	ANATOMICAL BASES OF HUMAN MOVEMENT	123
	INTRODUCTION	123
	TERMINOLOGY	123
	SKELETON	124
	Axial Skeleton	125
	Appendicular Skeleton	
	JOINT STRUCTURE	
	THE MUSCLES	127
		128
	Upper Limbs	129
	Lower Limbs	132
	THE NERVOUS SYSTEM	133
	HEART-CIRCULATORY-RESPIRATORY SYSTEMS	134
	SUMMARY	134
	REFERENCES	134
Chapter 9.	PHYSIOLOGICAL BASES OF HUMAN MOVEMENT	137
	INTRODUCTION	137

<u></u>	
Contents	XIII

	PHYSIOLOGY OF SKELETAL SYSTEM	138
	The Lever System	138
	PHYSIOLOGY OF THE MUSCULAR SYSTEM	138
	THE NEURAL SYSTEM AND MOVEMENT	141
	BIOCHEMISTRY OF MOVEMENT	142
	REFERENCES	144
PART	IV. PHYSICAL EDUCATION—ITS PSYCHOSOCIAL	
1.1111	FOUNDATIONS	
	1 GENDINIONS	
Chapter 10.	PSYCHOLOGICAL BASES OF HUMAN MOVEMENT	147
	INTRODUCTION	147
	THEORIES OF LEARNING	149
	Connectionist Theories	150
	Cognitive Theories	151
	LEARNING MODELS	153
	LAWS OF LEARNING	153
	PERCEPTUAL-MOTOR LEARNING	155
	CONCEPT DEVELOPMENT THROUGH MOVEMENT	159
	REFERENCES	159
Chapter 11.	SOCIAL BASES OF HUMAN MOVEMENT	163
•	INTRODUCTION	163
	SOCIAL ORGANIZATION	164
	SOCIETY	164
	SOCIALIZATION.	165
	Integration	166
	Competition.	166
	Conflict	166
	Rivalry	167
	Accommodation	167
	Compromise	167
	Subordination	167
	Mediation	167
	Arbitration	
		167
	Toleration	167
	Truce	167
	Cooperation	167
	Assimilation	168
	Sanctions	168
	CULTURE	168
	Forms of Culture	169
	Nonmaterialistic	169
	Materialistic	170
	Cultural Lag	170
	Transmission of Culture	170
	PERSONALITY	171
	SOCIAL GROUPS	172

xiv Contents

Status
Leadership
Social Mobility
Types of Groups
SOCIAL CHANGE
Types of Social Change
SOCIAL VALUES
IMPLICATIONS OF SOCIOLOGY FOR PHYSICAL EDUCATION       177         SOCIALIZATION THROUGH SPORT       178         Role Playing       178         Status       178         Social Stratification       175         Self-image       179         Competition and Cooperation       179         SPORT IN THE SCHOOLS       180         REFERENCES       181     Chapter 12.  ANTHROPOLOGICAL BASES OF HUMAN MOVEMENT  INTRODUCTION  Biological Evolution  Cosmos  PHYSICAL ANTHROPOLOGY  Biological Evolution  Cosmos  187  Early Life on Earth  Mechanics of Biological Evolution  Genetics  Mutation  Biomatical Evolution  Biomatical Evo
SOCIALIZATION THROUGH SPORT
Role Playing
Status
Social Stratification
Self-image
Competition and Cooperation
SPORT IN THE SCHOOLS   180   REFERENCES   181   Chapter 12.   ANTHROPOLOGICAL BASES OF HUMAN MOVEMENT   185   INTRODUCTION   185   PHYSICAL ANTHROPOLOGY   187   Biological Evolution   187   Cosmos   187   Early Life on Earth   188   Mechanics of Biological Evolution   189   Genetics   189   Mutation   189   Natural Selection   190   From Prosimia to Homo Sapiens   190   Crucial Changes During Evolution   191   Language   192   Cooperative Behavior   193   Speciation and Race Development   193   CULTURAL EVOLUTION   193   IMPLICATIONS OF ANTHROPOLOGY FOR THE PHYSICAL
SPORT IN THE SCHOOLS   180   REFERENCES   181   Chapter 12.   ANTHROPOLOGICAL BASES OF HUMAN MOVEMENT   185   INTRODUCTION   185   PHYSICAL ANTHROPOLOGY   187   Biological Evolution   187   Cosmos   187   Early Life on Earth   188   Mechanics of Biological Evolution   189   Genetics   189   Mutation   189   Natural Selection   190   From Prosimia to Homo Sapiens   190   Crucial Changes During Evolution   191   Language   192   Cooperative Behavior   193   Speciation and Race Development   193   CULTURAL EVOLUTION   193   IMPLICATIONS OF ANTHROPOLOGY FOR THE PHYSICAL
Chapter 12.         ANTHROPOLOGICAL BASES OF HUMAN MOVEMENT         185           INTRODUCTION         185           PHYSICAL ANTHROPOLOGY         187           Biological Evolution         187           Cosmos         187           Early Life on Earth         188           Mechanics of Biological Evolution         189           Genetics         189           Mutation         189           Natural Selection         190           From Prosimia to Homo Sapiens         190           Crucial Changes During Evolution         191           Language         192           Cooperative Behavior         192           Speciation and Race Development         193           CULTURAL EVOLUTION         193           IMPLICATIONS OF ANTHROPOLOGY FOR THE PHYSICAL
Chapter 12.         ANTHROPOLOGICAL BASES OF HUMAN MOVEMENT         185           INTRODUCTION         185           PHYSICAL ANTHROPOLOGY         187           Biological Evolution         187           Cosmos         187           Early Life on Earth         188           Mechanics of Biological Evolution         189           Genetics         189           Mutation         189           Natural Selection         190           From Prosimia to Homo Sapiens         190           Crucial Changes During Evolution         191           Language         192           Cooperative Behavior         192           Speciation and Race Development         193           CULTURAL EVOLUTION         193           IMPLICATIONS OF ANTHROPOLOGY FOR THE PHYSICAL
INTRODUCTION 185 PHYSICAL ANTHROPOLOGY 187 Biological Evolution 187 Cosmos 187 Early Life on Earth 188 Mechanics of Biological Evolution 189 Genetics 189 Mutation 189 Natural Selection 190 From Prosimia to Homo Sapiens 190 Crucial Changes During Evolution 191 Language 192 Cooperative Behavior 192 Speciation and Race Development 193 CULTURAL EVOLUTION 193 IMPLICATIONS OF ANTHROPOLOGY FOR THE PHYSICAL
PHYSICAL ANTHROPOLOGY       187         Biological Evolution       187         Cosmos       187         Early Life on Earth       188         Mechanics of Biological Evolution       189         Genetics       189         Mutation       189         Natural Selection       190         From Prosimia to Homo Sapiens       190         Crucial Changes During Evolution       191         Language       192         Cooperative Behavior       192         Speciation and Race Development       193         CULTURAL EVOLUTION       193         IMPLICATIONS OF ANTHROPOLOGY FOR THE PHYSICAL
Biological Evolution       187         Cosmos       187         Early Life on Earth       188         Mechanics of Biological Evolution       189         Genetics       189         Mutation       189         Natural Selection       190         From Prosimia to Homo Sapiens       190         Crucial Changes During Evolution       191         Language       192         Cooperative Behavior       192         Speciation and Race Development       193         CULTURAL EVOLUTION       193         IMPLICATIONS OF ANTHROPOLOGY FOR THE PHYSICAL
Cosmos       187         Early Life on Earth       188         Mechanics of Biological Evolution       189         Genetics       189         Mutation       189         Natural Selection       190         From Prosimia to Homo Sapiens       190         Crucial Changes During Evolution       191         Language       192         Cooperative Behavior       193         Speciation and Race Development       193         CULTURAL EVOLUTION       193         IMPLICATIONS OF ANTHROPOLOGY FOR THE PHYSICAL
Early Life on Earth       188         Mechanics of Biological Evolution       189         Genetics       189         Mutation       189         Natural Selection       190         From Prosimia to Homo Sapiens       190         Crucial Changes During Evolution       191         Language       192         Cooperative Behavior       192         Speciation and Race Development       193         CULTURAL EVOLUTION       193         IMPLICATIONS OF ANTHROPOLOGY FOR THE PHYSICAL
Mechanics of Biological Evolution       189         Genetics       189         Mutation       189         Natural Selection       190         From Prosimia to Homo Sapiens       190         Crucial Changes During Evolution       191         Language       192         Cooperative Behavior       192         Speciation and Race Development       193         CULTURAL EVOLUTION       193         IMPLICATIONS OF ANTHROPOLOGY FOR THE PHYSICAL
Mechanics of Biological Evolution       189         Genetics       189         Mutation       189         Natural Selection       190         From Prosimia to Homo Sapiens       190         Crucial Changes During Evolution       191         Language       192         Cooperative Behavior       192         Speciation and Race Development       193         CULTURAL EVOLUTION       193         IMPLICATIONS OF ANTHROPOLOGY FOR THE PHYSICAL
Mutation
Natural Selection
From Prosimia to Homo Sapiens
From Prosimia to Homo Sapiens
Crucial Changes During Evolution
Language
Speciation and Race Development
Speciation and Race Development
CULTURAL EVOLUTION
IMPLICATIONS OF ANTHROPOLOGY FOR THE PHYSICAL
EDI ICATOR 195
HDC0111010
Implications for Fitness and Exercise
The Alarm Reaction 196
Implications for Social Behavior
Human Sexual Differences
Genetic Basis of Play 198
Genetic Basis of Play
Genetic Basis of Play

Contents XV

# PART V. PHYSICAL EDUCATION—BASES OF HUMAN PHYSICAL PERFORMANCE

Chapter 13.	HEALTH, FITNESS, GROWTH AND HUMAN PERFORMANCE	203
	INTRODUCTION	203
	GROWTH AND DEVELOPMENT	203
	Genetics	204
	Body Types	205
	Posture and Body Mechanics	206
	Growth and Developmental Characteristics	207
	HEALTH	207
	Disintegrating Factors	207
	Emphasis on Cortical Activity	208
	Sedentarianism	208
	Mechanization and Automation of Work, Play, and	
	Industry	208
	Stress and Its Effect	209
	Leisure in Abundance	209
	Joy and Self-expression Have Been Taken from Most Work	210
	High Standards of Living	210
	CARDIOVASCULAR DISEASES	210
	OVERWEIGHT AND OBESITY	211
	FITNESS	212
	Physical Fitness	212
	The Circulorespiratory System	213
	The Circulatory System	213
	The Respiratory System	214
	Exercise Prescription	215
	Step One: Medical Clearance	215
	Step Two: Goal Identification	215
	Step Three: Circulorespiratory Fitness Evaluation	215
	Step Four: Selection of Training Style and Exercise Type	215
	Steps Five, Six, and Seven: Selecting Training Frequency,	
	Intensity, and Duration	215
	Step Eight: Periodic Evaluation	216
	Fitness Programs	216
	REFERENCES	217
Ch 4.4	MOTOR LEARNING AND HUMAN REPRODUCANON	
Chapter 14.	MOTOR LEARNING AND HUMAN PERFORMANCE	219
	INTRODUCTION	219
	MOTOR CONTROL AND THE BASICS OF MOTOR LEARNING	220
	CLASSIFICATION OF SKILLS	222
	FEEDBACK	222
	Mechanism for Feedback	223
	Types of Feedback	224
	Intrinsic Feedback	224
	Extrinsic Feedback	224
	Concurrent Feedback	225
	Terminal Feedback	225

xvi Contents

	Some Implications of Feedback	225
	REINFORCEMENT	226
	MEMORY AND RETENTION	227
	CONDITIONS AFFECTING LEARNING	228
	Goals	228
	Practice	229
	Motivation	230
	Mental Practice	231
	Transfer	232
	The Learning Curve	233
	Whole and Part Learning	234
	Self-analysis	235
	Readiness	235
	Form	236
	SPECIFICITY VS. GENERALITY OF TASKS	236
	REFERENCES	237
Chapter 15.	EXERCISE PHYSIOLOGY AND HUMAN PERFORMANCE	239
	INTRODUCTION	239
	SOURCES OF ENERGY	240
	THE ENERGY PATHWAYS OF EXERCISE	240
	The ATP-PC System	240
	The Oxygen System (Aerobic)	241
	The Lactic Acid System (Anaerobic)	241
	IMPLICATION OF THE ENERGY PATHWAYS	242
	TRAINING EFFECTS OR BENEFITS OF EXERCISE	243
	Benefits of Exercise to the Heart and Circulatory System	243
	Benefits of Exercise to the Respiratory System	244
	Benefits of Exercise to the Muscular System	244
	Benefits to Other Vital Organs and the Nutritive System	245
	REFERENCES	246
Cl. 1 10	BYON WICH ANNOUS OF THE PARTY OF THE	The same and the s
Chapter 16.	BIOMECHANICS OF HUMAN MOVEMENT	249
	INTRODUCTION	249
	CLASSIFICATION OF MOVEMENTS	250
	Supportive Tasks	250
	Equilibrium	250
	Lowered Center of Gravity	251
	Enlarged Base of Support	251
	Body Size and Concentration of Weight	251
	Suspension Tasks	251
	Tasks Involving Motion of the Body and/or Objects	252
	Law of Inertia	252
	Law of Acceleration	253
	Law of Equal and Opposite Force	253
	Principles Relating to Projection	254
	Task Involving Force	255
	SUMMARY OF PRINCIPLES	255
	VALUE OF BIOMECHANICS TO THE PHYSICAL EDUCATOR	255

XVII

	QUANTITATIVE ANALYTICAL BIOMECHANICAL	
	TECHNIQUES	256
	Cinematography	256
	Kinetography	257
	Electromyography	257
	Goniography	257
	QUALITATIVE ANALYTICAL BIOMECHANICAL	
	TECHNIQUES	257
	REFERENCES	258
DADE	NA DINOICAL EDUCATION VALUES AND SDORT	
PAKI	VI. PHYSICAL EDUCATION—VALUES AND SPORT	
Chapter 17.	SOCIOPSYCHOLOGICAL VALUES	261
	INTRODUCTION	261
	VALUELESSNESS AND MEANINGLESSNESS	263
	BIOLOGICAL BASIS OF VALUES	263
	THE NATURE OF VALUES	264
	ETHICAL AND MORAL VALUES	265
	HOW VALUES ARE TRANSMITTED	266
	DEMOCRACY AND VALUES	267
	SELF-ACTUALIZATION AND CONCEPT OF "THE GOOD	
	LIFE"	268
	HOW VALUES GROW AND CHANGE FOR THE INDIVIDUAL	270
	Peck and Havighurst's Socialization Framework	270
	Piaget's System of Rules	271
	Kohlberg's Moral Stages	272
	IMPLICATIONS OF THE VALUE GROWTH FRAMEWORK	272
	ROLE OF EDUCATION IN HUMAN VALUES	274
	PHYSICAL EDUCATION AND VALUE EDUCATION	276
	TEACHING VALUES THROUGH PHYSICAL EDUCATION	278
	Clarification of Objectives	278
	Formal Plan for Teaching	278
	METHODOLOGY AND PROCEDURES OF VALUE TRAINING	279
	Measurement of Value Status and Progress	280
	Adjusting the Learning Climate	281
	REFERENCES	282
Chapter 18.	SPORT IN SOCIETY	285
Chapter 10.	INTRODUCTION	285
	PARADIGMS OF SPORT	287
	Product-oriented Paradigm	288
	Process-oriented Paradigm	288
	Product-Process Paradigm	289
	SPORT IN SOCIETY	289
	Sport in the Schools	290
	The Positive Forces	291
	Negative Aspects of Sport	292
	A NEW FOCUS IN SPORT	294

xviii Contents

	SPORT PROBLEM AREAS	296
	Sport and Sportsmanship	297
	Sport and the Black Athlete	298
	Sport and the Media	299
	Sport and Politics	301
	Sport and Women	302
	Sport and Youth	304
	Sport and Religion	306
	REFERENCES	307
	Tal Eldivolo	
	PART VII. THE PROFESSION	
Chapter 10	PROFESSIONAL COMPETENCE AND PROMOTION OF THE	
Chapter 19.	PROFESSIONPROFESSION	311
	INTRODUCTION	311
	WHAT IS A PROFESSION?	311
	CRITERIA OF A PROFESSION	
	Scientific and Philosophical Bases	
	Specialized Skills	
		314
	Code of Ethics	315
	Extended Period of Preparation	
	Body of Literature and Scholarly Achievements	
	Professional Associations	316
	PROFESSIONAL OPPORTUNITIES	316
	Teaching	317
	Elementary Level	317
	Middle School Level	317
	Secondary Level	318
	Adapted Physical Education	318
	College/University Teaching	318
	Coaching	318
	Sports Management Positions	
	Corporate Fitness/Sports Directors	
	Leisure and Recreation	319
	Sports Medicine	
	Sports and Fitness Clubs	
	Media Positions	320
	Business/Sales Positions	320
	PROFESSIONAL AND PERSONAL COMPETENCE	320
	PRODUCT AND PROCESS	321
	COMPETENCIES	322
	PROFESSIONAL RESPONSIBILITY	322
	PROFESSIONAL ORGANIZATIONS	323
	REFERENCES	325
Index		205
muex		327

## PART I

Introduction to Physical Education



JOY OF EFFORT by R. Tait McKenzie. Lloyd P. Jones Gallery, University of Pennsylvania. Photo by Frank Ross, Ocean City, N.J.