

CONTENTS

	PAGE
FOREWORD	iii
BY SIR FREDERICK BANTING	
CHAPTER I	
INTRODUCTORY CONSIDERATIONS	1
BY GARFIELD G. DUNCAN	
Metabolism	1
Basal Metabolism	2
Conditions Which Alter the Basal Metabolic Rate	11
CHAPTER II	
CARBOHYDRATE METABOLISM	19
BY C. N. H. LONG	
Carbohydrates of Biological Importance	19
Digestion of Carbohydrates	19
Absorption of Carbohydrates	21
Carbohydrates of the Blood and the Blood Glucose	24
The Glucose Tolerance Curve	25
Glucose in Other Body Fluids	27
Glucose Content of the Tissues	28
The Glycosurias	28
The Intermediary Metabolism of Glucose	31
Carbohydrate Metabolism in the Tissues	39
The Formation of Fat from Carbohydrate	51
The Endocrine Control of Metabolism	55
CHAPTER III	
PROTEIN METABOLISM	73
BY ABRAHAM WHITE	
Experimental Methods	73
Protein Requirement	79
Digestion of Protein	86
Absorption of Products of Protein Digestion	89
Fate of Absorbed Amino Acids	90
Catabolism of Amino Acids	96
Sulfur Metabolism	106
Metabolism of Phenylalanine and Tyrosine	114
Metabolism of Tryptophane	120
Metabolism of Arginine	123
Metabolism of Histidine	126
Metabolism of Lysine	129
Some Aspects of Glycine Metabolism	130

CHAPTER IV		PAGE
LIPID METABOLISM	.....	137
BY ABRAHAM WHITE		
Introduction	.....	137
Digestion of Lipids	.....	140
Absorption of Products of Lipid Digestion	.....	142
The Nature and Transport of Blood Lipids	.....	145
Fate of Absorbed Lipids	.....	148
Sterols: Nature and Metabolism	.....	167
CHAPTER V		
MINERAL METABOLISM	.....	174
BY ABRAHAM CANTAROW		
Calcium and Phosphorus	.....	174
Functions	.....	174
Requirements	.....	176
Absorption	.....	178
Excretion	.....	179
Blood Calcium	.....	180
Phosphatase Activity	.....	182
Hypercalcemia	.....	184
Hypocalcemia	.....	186
Inorganic Phosphorus in Blood	.....	187
Calcium and Phosphorus in Other Body Fluids	.....	188
Hyperparathyroidism	.....	189
Hypoparathyroidism and Tetany	.....	202
Vitamin D	.....	212
Mineral Metabolism and Teeth	.....	217
Pathological Calcification	.....	218
Magnesium Metabolism	.....	221
Functions	.....	221
Absorption, Excretion, Requirement	.....	222
Blood Magnesium	.....	222
Iron Metabolism	.....	223
Requirement, Absorption, Excretion	.....	223
Blood Iron	.....	224
Intermediary Metabolism and Storage	.....	225
Abnormal Iron Metabolism	.....	226
Iodine Metabolism	.....	226
Normal Iron Metabolism	.....	227
Abnormal Iodine Metabolism	.....	231
Simple Goiter	.....	233
Hypothyroidism (Cretinism; Myxedema)	.....	234
Hyperthyroidism	.....	239
Exophthalmic Goiter (Toxic Goiter; Graves' Disease)	.....	240
Toxic Nodular Goiter (Toxic Adenoma)	.....	247
Iodine Metabolism in Other Diseases	.....	248
Sodium, Chloride and Potassium Metabolism	.....	248
Addison's Disease	.....	252

PAGE

Acute Adrenocortical Insufficiency	263
Adrenocortical Hyperfunction	263
Dehydration	264
Familial Periodic Paralysis	265
Miscellaneous	268

CHAPTER VI

WATER BALANCE IN HEALTH AND IN DISEASE	270
--	-----

BY JOHN P. PETERS

Physiologic Considerations	270
Functional Divisions of Body Fluids	271
The Acid-Base Patterns of the Body Fluids	278
Regulation of Water Balance, Electrolyte and Acid-Base Equilibrium by the Kidney	285
Clinical Disorders of Water Metabolism and Acid-Base Equilibrium	309
Edema	309
The Influence of the Endocrine Glands on Water Metabolism and Acid-Base Balance	313
Excessive Sweating	317
Pulmonary Diseases Accompanied by Salt Depletion	317
Lobar Pneumonia	317
Pulmonary Emphysema	318
Tuberculosis and Other Chronic Conditions of the Lungs	318
The Nature of "Shock" and Its Effect on Water Distribution	319
The Effects of Diseases and Disorders of the Gastrointestinal Tract on Water Metabolism and Acid-Base Balance	321
Disturbances of Acid-Base Equilibrium and of Water and Salt Metabolism in Heart Failure	327
Disturbances of Water and Salt Metabolism and Acid-Base Balance in Nephritis and Other Diseases of the Kidneys and Urinary Tract	329

CHAPTER VII

NUTRITIONAL AND METABOLIC ASPECTS OF DISORDERS OF THE BLOOD	351
---	-----

BY LEANDRO M. TOCANTINS

Anemias	351
Classification of Anemias	353
Treatment of the Anemias	357
Polycythemia	358
Disorders of Leukocytes	358
Leukopenias	359
Leukemias	359
Disorders of Bleeding	360
Hemophilia	364
Thrombopenia	364

CHAPTER VIII	PAGE
VITAMINS AND AVITAMINOSES	366
BY TOM D. SPIES AND HUGH R. BUTT	
Introduction	366
Vitamin E	367
Chemistry, Physiology, Pathology	368
Clinical Use	369
Requirements and Sources	370
Vitamin K	371
Hemorrhagic Diathesis in Patients Who Have Jaundice and Certain Intestinal Disorders and in the Newborn Infant	371
Chemistry	371
Physiology	373
Effect of Deficiency of Vitamin K	374
Toxicity	377
Human Requirements	378
Assay Methods and Unitage	378
Methods of Measuring Deficiency of Prothrombin	379
Diagnosis	381
Treatment	384
Vitamin A	388
Night Blindness, Keratomalacia, Xerophthalmia	388
Chemistry	388
Physiology	390
Pathology	394
Methods of Measuring Deficiency of Vitamin A	397
Diagnosis	398
Treatment	399
Deficiency of Vitamin D (Rickets)	400
Chemistry	401
Physiology	402
The Human Requirement	404
Sources	405
Etiology of Rickets	408
Pathology of Deficiency of Vitamin D	409
Pathology of Hypervitaminosis D	411
Diagnosis of Deficiency of Vitamin D	411
The Prevention and Treatment of Deficiency of Vitamin D ..	415
Toxic Effects of Vitamin D	418
Thiamine Deficiency	419
Biochemistry and Physiology	420
Pathology	423
Symptomatology	427
Diagnosis	429
Course and Prognosis	430
Treatment with Thiamine	430
Nicotinic Acid Amide Deficiency (Pellagra)	432
Pathological Physiology	432
General Clinical Considerations	436

	PAGE
Diagnosis	439
Treatment with Nicotinic Acid	443
Riboflavin Deficiency	449
Biochemistry and Physiology	450
General Clinical Considerations	453
Diagnosis	457
Mode of Administration of Riboflavin	458
Ascorbic Acid Deficiency	459
Biochemistry	461
Pathological Physiology	461
Symptomatology	463
Diagnosis	466
Treatment with Ascorbic Acid	466
Clinically Less Well-known Vitamins	468
Pyridoxine (Vitamin B ₆)	469
Adenylic Acid	470
Pantothenic Acid	471
Inositol	473
Biotin	473
Choline	475
"Extrinsic Factor"	475
The Human Diet and Mixed Deficiency Diseases	478
Primary Etiology	479
Secondary Etiology	481
Clinical Features, Diagnosis	483
The Treatment of Dietary Deficiency Diseases	490
General Management	491
Dietotherapy	492
Yeast, Liver Extract, Wheat Germ, and Rice Polishings as Special Therapeutic Agents	494
The Proper Use of Vitamins in Mixtures	499
Summary of Treatment	499
Recapitulation	500
 CHAPTER IX	
UNDERNUTRITION	503
BY L. H. NEWBURGH	
General Considerations	503
Energy Requirements	504
Treatment	507
 CHAPTER X	
OBESITY	513
BY FRANK A. EVANS	
Definition	513
Classification	513
Incidence	515
Menace to Good Health	519

	PAGE
Nature and Causes	522
Physiological Considerations	529
Treatment	561
Increased Energy Output	561
Decreased Energy Intake	566
Signs, Symptoms and Results of Treatment	578
Cooperation	587
 CHAPTER XI	
XANTHOMATOSES, GLYCOGEN DISEASE, AND DISTURBANCES OF INTER-MEDIARY METABOLISM	592
BY EDWARD MASON	
Xanthomatoses (Lipoidoses)	592
Glycogen Disease	597
Disturbances of Intermediary Metabolism	600
 CHAPTER XII	
GOUT	609
BY WALTER BAUER AND FRIEDRICH KLEMPERER	
Definition	609
Purine Metabolism	610
Etiology	617
Pathology	620
Clinical Manifestations and Course	631
Premonitory Symptoms	633
Precipitating Factors	636
Diagnosis	638
Complications	646
Treatment	647
Acute Attack	647
Interval Treatment	648
Prognosis	650
Summary	650
 CHAPTER XIII	
HYPERINSULINISM	655
BY GARFIELD G. DUNCAN	
Causes of Spontaneous Hypoglycemia	655
Hyperinsulinism	656
Functional Hyperinsulinism	668
The Consideration of Other Causes of Spontaneous Hypoglycemia	669
Treatment of Hyperinsulinism	673

CONTENTS

xv

CHAPTER XIV

DIABETES INSIPIDUS	678
--------------------------	-----

BY GARFIELD G. DUNCAN

Pathogenesis	678
Types of Diabetes Insipidus	680
Symptomatology	681
Laboratory Findings, Prognosis	682
Diagnosis	684
Treatment	684

CHAPTER XV

MELITURIA	690
-----------------	-----

BY ABRAHAM CANTAROW

Normal Urine Sugar	690
Renal Threshold	690
Melituria	692
Glycosuria	693
Levulosuria	696
Pentosuria	697
Lactosuria, Galactosuria	698

CHAPTER XVI

DIABETES MELLITUS	700
-------------------------	-----

BY GARFIELD G. DUNCAN

Introduction	700
Etiology (C. N. H. Long)	711
Symptomatology	722
Physical Findings	724
Pathology	725
Diagnosis	734
Differential Diagnosis	745
Prognosis	749
Prevention	749
Treatment	751
Diet	752
Insulin	766
Complications of Insulin Therapy—Hypoglycemia	776
Exercise	787
General Care	788
Miscellaneous Factors in the Treatment of Diabetes	789
Complications	791
Degenerative Changes	791
Arteriosclerosis	791
Gangrene	795
Care of the Feet	801
Ocular Complications	807
Diabetic Peripheral Neuritis	809
Ketosis (Diabetic Coma)	811

	PAGE
Acute Infections	827
Tuberculosis	831
Cancer, Syphilis, Skin Disorders	835
Disturbances in Sexual Characteristics Complicating Diabetes	841
Diseases of the Liver	844
Cholecystitis and Cholelithiasis in Diabetes	844
Surgery and Diabetes Mellitus	845
Diseases of the Thyroid Gland	851
Insulin-refractory and Insulin-resistant Cases	853
Pernicious Anemia	856
Infections of the Urinary Tract	856
Hemochromatosis (Bronze Diabetes)	857
Diabetes Mellitus and Pregnancy (G. G. Duncan and F. Fetter) ..	862
Consideration of the Diabetic Mother	862
The Diagnosis of Diabetes in the Pregnant Woman	864
The Effect of Pregnancy on the Diabetes	864
Management of the Pregnant Diabetic Patient	865
Termination of Pregnancy	866
Treatment of the Diabetic Patient During Labor and Pregnancy	868
Consideration of the Fetus and Neonatal Infant of the Diabetic Mother	869
Diabetes in Childhood and Adolescence (Tracy D. Cuttle)	874
Incidence	875
Etiology	877
Symptoms	880
Diagnosis	880
Treatment	882
Complications of Insulin Treatment in Children and Adolescents	893
Pathology	906
Progress of the Diabetic Child	909
Prognosis	913
APPENDIX	917
BY GARFIELD G. DUNCAN	
Composition of Foods (Alphabetically Arranged)	917
Heights and Weights of Children Between One and Four Years of Age (Without Clothes)	935
Height-Weight-Age Tables	936
Heights and Weights of 136,504 Women Fifteen or More Years of Age (Without Clothes)	938
Heights and Weights of 221,819 Men Fifteen or More Years of Age (Without Clothes)	939
Determination of Basal Energy Requirements	940
INDEX	941