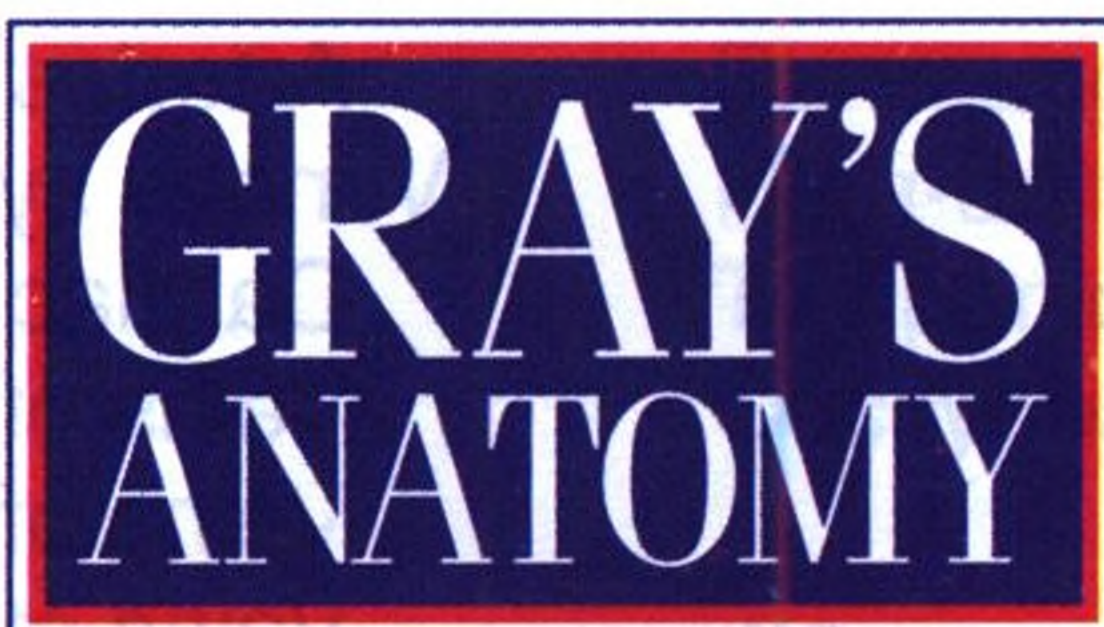




CONTENTS

PREFACE ix

CONTRIBUTORS xi

HISTORICAL ACCOUNT xv

Biography of Henry Gray xv
Brief history of *Gray's Anatomy* xvii

1 INTRODUCTION TO HUMAN ANATOMY 1

Edited by Lawrence H. Bannister

What is anatomy? 2
Origin of life on Earth 3
Evolution of life on Earth 3
Primate and human evolution 7
Anatomical nomenclature 13

2 CELLS AND TISSUES 17

Edited by Lawrence H. Bannister

Cell structure 21
Cytoplasm 23
Cytoskeleton 36
Nucleus 46
Reproduction of cells 56
Tissues 67
Epithelium 67
Unilaminar epithelia 67
Multilaminar epithelia 71
Glands 73
Connective tissues 75

3 EMBRYOLOGY AND DEVELOPMENT 91

Edited by Patricia Collins

Developmental biology 102
Early human development 121
Development of individual systems 173
Respiratory and gastrointestinal systems 174
Urinary and reproductive systems 199
Nervous system and special sense organs 217
Musculoskeletal system 264
Cardiovascular system 298
Prenatal growth in form and size 328

4 NEONATAL ANATOMY AND GROWTH 343

Edited by Patricia Collins

Neonatal anatomy 344
Individual systems in the neonate 346
Growth 365

5 INTEGUMENTAL SYSTEM 375

Edited by Lawrence H. Bannister

Skin 376
Introduction 376
Epidermis 381
Dermis 395
Nerves 399
Blood vessels 398
Age-related changes 411
Repair 412
Breasts (mammary) 417
Female breasts 418
Male breasts 424

6 SKELETAL SYSTEM 425

Edited by Roger W. Soames

Morphology of the human skeleton 426
Skeletal connective tissues 443
The scope of arthrology 484
Axial skeleton 510
Vertebral column 511
Ribs 539
Thorax 545
Skull 547
Appendicular skeleton 613
Upper limb 615
Wrist and hand 646
Lower limb 662
Ankle and foot 712

7 MUSCLE 737

Edited by Stanley Salmons

Introduction 738
Brief survey of the major types of muscle 738
Skeletal muscle 738
Cardiac muscle 764
Smooth muscle 771
Attachments of skeletal muscles 781
Form and function in skeletal muscles 783
Form and fibre architecture 783
Functional implications of form 783
Muscles and movement 785
Muscles and fasciae of the head 789
Craniofacial muscles 789
Masticatory muscles 799
Anterolateral muscles and fasciae of the neck 802
Superficial and lateral cervical muscles 804
Suprahyoid muscles 806
Infrahyoid muscles 807

Anterior vertebral muscles 807
Lateral vertebral muscles 808
Muscles and fasciae of the trunk 809
 Deep muscles of the back 809
 Suboccipital muscles 813
 Muscles of the thorax 813
 Muscles of the abdomen 819
 Muscles and fasciae of the pelvis 829
 Muscles and fasciae of the perineum 832
Muscles and fasciae of the upper limb 835
 Muscles connecting the upper limb with the vertebral column 835
 Muscles connecting the upper limb with the thoracic wall 838
 Muscles of the scapula 840
 Muscles of the upper arm 842
 Muscles of the forearm 844
 Muscles of the hand 858
Muscle and fasciae of the lower limb 868
 Muscles of the iliac region 868
 Muscles of the thigh and gluteal region 870
 Muscles of the leg 881
 Muscles of the foot 889

8
NERVOUS SYSTEM 901

Edited by Martin M. Berry, Susan M. Standring,
Lawrence H. Bannister

Introduction to the nervous system 902
Cytology of the nervous system 921
Regional organization of the central nervous system 974
 Spinal medulla or cord 975
 Rhombencephalon 1011
 Mesencephalon 1066
 Diencephalon 1079
 Telencephalon 1107
 Basal nuclei 1186
 Fluid compartments and fluid balance in the central nervous system 1202
Peripheral nervous system 1224
 Cranial nerves 1225
 Spinal nerves 1258
 Autonomic nervous system 1292
Peripheral apparatus of the special senses 1312
 Gustatory apparatus 1312
 Olfactory apparatus 1315
 Peripheral visual apparatus 1321
 Accessory visual apparatus 1353
 Auditory and vestibular apparatus 1367

9
HAEMOLYMPHOID SYSTEM 1399

Edited by Lawrence H. Bannister

Haemal cells and tissue 1400
Haemopoiesis 1407
Lymphoid cells and tissues 1417
 Lymphocytes 1417
 Thymus 1423
 Lymph nodes 1431
 Spleen 1437
 Mucosa-associated lymphoid tissue 1442

10
CARDIOVASCULAR SYSTEM 1451

Edited by Giorgio Gabella

Blood vessels 1452
Thoracic cavity and heart 1470
Arterial system 1504
 Aorta 1505
 Carotid system of arteries 1513
 Subclavian system of arteries 1529
 Arteries of the trunk 1545

Arteries of the lower limbs 1564
Venous system 1574
 Cardiac veins 1575
 Veins of the head and neck 1576
 Veins of the upper limbs 1589
 Veins of the thorax 1591
 Veins of the lower limbs 1595
 Veins of the abdomen and pelvis 1598
Lymphatic system 1605

11
RESPIRATORY SYSTEM 1627

Edited by Lawrence H. Bannister

Introduction 1628
Nose and paranasal sinuses 1631
Larynx 1637
Trachea and bronchi 1653
Lungs 1657
Pleurae 1662
Mediastinum 1676

12
ALIMENTARY SYSTEM 1683

Edited by Lawrence H. Bannister

Introduction 1684
Oral cavity and related structure 1686
 Palate 1688
 Salivary glands 1691
 Teeth 1699
 Tongue 1721
 Pharynx 1725
Abdomen 1733
 Peritoneum 1734
Oesophagus to anus 1746
 Introduction 1746
 Enteric nervous system 1749
 Oesophagus 1751
 Stomach 1753
 Small intestine 1763
 Large intestine 1774
 Gastro-entero-pancreatic endocrine system 1787
 Hernia 1788
 Pancreas 1790
 Liver 1795
 Liver transplantation 1808
 Biliary ducts and gallbladder 1809

13
URINARY SYSTEM 1813

Edited by Mary Dyson

Kidneys 1815
 Renal microstructure 1819
 Juxtaglomerular apparatus 1824
 Renal vessels and nerves 1826
 Renal blood vessels 1826
 Upper urinary tract 1827
Ureters 1828
Kidney transplantation 1834
Urinary bladder 1837
Male urethra 1842
Female urethra 1843

14
REPRODUCTIVE SYSTEM 1847

Edited by Lawrence H. Bannister and Mary Dyson

Reproductive organs of the male 1848
 Testes and epididymes 1848
 Ductus deferens (vas deferens) 1855
 Spermatic cord 1856

Scrotum 1856
Penis 1857
Prostate 1859
Reproductive organs of the female 1861
Ovaries 1861
Uterine tubes 1867
Uterus 1869
Vagina 1875
Female external organs 1876

15
ENDOCRINE SYSTEM 1881
Edited by Mary Dyson

Adenohypophysis 1883
Neurohypophysis 1886
Pineal gland 1888
Thyroid gland 1891
Parathyroid glands 1897
Chromaffin system 1898
Diffuse neuroendocrine system 1898
Suprarenal (adrenal) glands 1900

Paraganglia 1905
Para-aortic bodies 1906
Tympanic body 1906
Coccygeal body 1906

16
SURFACE ANATOMY 1909
Edited by Harold Ellis and Julian E. Dussek

Head 1911
Neck 1914
Thorax 1915
Abdomen 1918
Perineum 1920
Back 1921
Upper limb 1923
Lower limb 1929

BIBLIOGRAPHY 1937

INDEX