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REGIONAL ANATOMY

IN ITS RELATION TO

MEDICINE AND SURGERY.

BY

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ILLUSTRATED FROM PHOTOGRAPHS TAKEN BY THE AUTHOR OF HIS OWN DISSECTIONS, EXPRESSLY DESIGNED AND PREPARED FOR THIS WORK, AND COLORED BY HIM AFTER NATURE.

"L'anatomie n'est pas telle qu'on l'enseigne dans les écoles."—Bichat.

IN TWO VOLUMES.

VOL. I.

THIRD EDITION.

(Ninth Thousand.)

JEFFERSON

PHILADELPHIA.

PUBLISHED BY THE EDITOR.

1880.
TO THE MEMORY

OF MY FATHER,

JOHN H. B. McCLELLAN, M.D.,

AND OF MY GRANDFATHER,

GEORGE McCLELLAN, M.D.
PREFACE TO THE SECOND EDITION.

That five thousand copies of Regional Anatomy have already been disposed of in America and England, and that the text is in progress of translation into French and German, are gratifying proofs of its favorable reception by the profession.

In venturing to present a second edition the author takes occasion to acknowledge the many kindly notices and reviews which have been bestowed upon his work.

The text has been thoroughly revised, and the reproduction of the illustrations from the original stones has received unremitting care from the lithographers, whose experience has enabled them to overcome some of the difficulties of producing the desired colors on the steam press, so that it is believed in this respect their work will be found to excel that of the first edition.

The stones from which the illustrations of the brain are now presented have mostly been re-drawn from the original photographs.

No one can more fully realize the shortcomings of the work than does the author, who assures his readers that he will at all times be grateful for any suggestions which may occur to them as likely to render his effort more complete and thereby assist him in his chief aim, the advancement of the knowledge of anatomy.

Broad and Spruce Streets,
Philadelphia, May, 1894.
There has been a great deal said of the importance of anatomical knowledge, which is universally conceded to be the foundation of the study of medicine.

As a teacher of anatomy, I have used all my influence to impress this on the minds of students, assuring them that the best book on anatomy is, and always will be, the body itself.

In the curricula of the colleges and universities this is emphasized by a compulsory course in the dissecting-room, and each candidate for a degree is obliged to dissect three parts—the head, and the extremities, with contiguous portions of the trunk—at least once. From the knowledge gained by these dissections, and from lectures and textbooks, a student is supposed to acquire the information necessary to enable him to work intelligently and beneficially in his profession. He is expected to learn anatomy from his three parts.

Considering the facts that the first part is generally wasted in acquiring the methods of using the instruments; that all the parts are seldom carefully injected with proper preservative; that the student rarely has the opportunity of seeing the viscera of the cranium, thorax, and abdomen in situ, much less of examining them and noting their size or structure and their relative positions to one another and to the cavities which contain them; and that often the value of the opportunity is not estimated until it is lost, it cannot be a matter of wonder that students look upon anatomy as one of their chief difficulties, and that only a few continue its study after graduation. There are many practical obstacles in the way of obtaining better and more abundant material for such research; but, after some years' experience, I am forced to acknowledge that, even if these obstacles were overcome, the distaste for the actual labor of dissecting, which, besides being exacting, is associated with much that is revolting, and even hazardous to health, would deter many students from gaining that practical knowledge from personal observation which would enable them to recognize the different tissues by the sense of touch as well as by the sense of sight.

In a crowded lecture-room only those who are very near can see the demonstrations so as really to profit by them. Extempore drawings are of great value in awakening and retaining the interest of students, whose memories are often overtasked, and have an advantage over the most carefully prepared diagrams, models, or preparations; but there
cannot be any means of illustration equal to the real thing in teaching, and the best substitute is that which aims at producing the most realistic impressions. Such illustrations have been attempted in the plates for the present work.

Regional Anatomy, or the anatomy of the different regions of the body individually considered, in the relations of their parts to one another, as they are naturally found, is really the most direct method of studying the subject. It is also the most useful form of anatomical research, and, although it may at first sight seem more difficult because it presents a complex in the place of a simple object, such as was demonstrated in the old method of considering the bones, the ligaments, the muscles, the vessels, and the nerves as so many distinct structures, the greater interest soon growing from the evidence of its practical usefulness fully compensates for the effort required.

The interest which my classes have shown in this treatment of anatomy has led me to undertake this work. It is largely the result of information acquired by dissecting, and of clinical observations in hospital and private practice. In its preparation I have consulted such ancient and modern books on anatomy as I could obtain, and have gleaned from them much information which suggested many of the dissections showing relations of structures. No quotation from or direct reference to these works, however, is introduced in the text, which has also, for the sake of clearness, been kept free from notes.

Assuming some previous knowledge of the bones on the part of the reader, I have exercised the privilege of adopting such modifications in the nomenclature as may render certain parts more easily comprehended, but have retained such names and terms as have an historic association, believing that they add to the interest and fasten themselves on the memory, rather than detract from the mastery of so difficult a study. It is to be regretted that anatomy loses much in consequence of the want of a definite nomenclature. The suggestions of modern writers as to technical terms, if accompanied by a corresponding clearness of description, might be of benefit to the student; but, while not underrating the importance of scientific exactness of expression, I am of the opinion that the ordinary student’s attention soon wears of technicality, whether written or spoken, and I have therefore made use of such terms in my text as experience has shown to be most easily understood and remembered. Anatomy, to be of use, must be made a practical and not a theoretical study. It is difficult enough pro re nata, and, if hard, need not be dry.

Should the present book fulfil its mission, it will be by presenting the matter in a new form, which it is hoped will prove interesting and useful, alike to the practitioner and to the student who intends to practise. The plates are expressly prepared to illustrate and verify the descriptions, and are as faithful representations of the dissections as they could be made. It should be borne in mind, however, that no true picture of the actual subject will have the distinct demarcation and clearness of a diagram, any more than the representation of a natural landscape indicates mountains, rivers, and boundary lines with the exactness of a map. Diagrams will therefore always be useful to the student in showing him what he ought to see, but such illustrations as are here attempted
should be valuable in enabling him to recognize things as they actually are. These representations are intended to meet the need both of the beginner in dissecting, who is appalled by the want of correspondence between that which he actually sees and that which he has been led to expect by diagrams or description, and of those whose time is too gravely occupied by the pressure of professional duties to warrant their dissecting for themselves. Accuracy has been the chief object, and I have relied upon the unfailing precision of the camera to present the true relations of the parts, which were in each case left in situ, only the adipose and connective tissues being removed, to give distinct impressions. Much thought, time, and expense have been given to the photographic details, such as the arrangement of the light to modify the shadows, the exposure and development of the negatives, and the subsequent printing and toning of the pictures to get the desired effect for the application of the water-colors. The coloring of the originals from which the plates were made on stone, under my personal supervision, was a study from nature, with perhaps some excess of tint or shade, as might be expected where the paints were mixed and applied with more enthusiasm than artistic skill.

The dissections, in all about three hundred, were invariably the work of my own scalpel, and were all done upon subjects selected as best showing the normal relations of the parts, without pathological change, while such facts as seem valuable regarding the condition or modes of preparation are mentioned in the description of every plate. Each figure is also accompanied by a separate and complete explanatory table,—every number being placed in regular order, so that any object may be readily found.

To Messrs. Lippincott Company, the publishers, my thanks are due for the warmth with which they have entered into my undertaking, for the strong sympathy and interest they have shown in my work, and for the care which they have taken to present the text to the reader in a clear and attractive form.

To Messrs. Armstrong & Co., of Boston, I am indebted for their painstaking fac-simile reproductions of my systematized views of dissections, which preserve the photographic accuracy and the realistic effect of the coloring of the originals, and which not only ought to render this an acceptable text-book, but should also awaken a keener interest in the study of Regional Anatomy.

GEORGE McCLELLAN.

PHILADELPHIA, October, 1890.
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N.B.—The platysma muscles have been removed from their attachment at the outer corners of the mouth, where they form the laughing muscles of Santorini. The vessels and nerves have also been removed, as they are shown in other plates, in order to give a clearer idea of the interdependence of the facial muscles.

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Dissection of a child, three weeks after birth, showing especially the relations of the thymus gland and the supra-renal capsules.

Figure 4.
Photograph of a preparation (in the author's cabinet), showing a remarkable disposition of the heart and independent origins of all the great vessels from the root of the aorta.
N.B.—This specimen was removed from the body of a young man, aged twenty-seven years, who died from phthisis. There is no arch to the aorta, and the position of the heart, when discovered, was vertical within the thorax, as shown in the figure. There is only one auricle and one ventricle. No other abnormality of the arteries was found in the body.

PLATE 27.
Topographical survey of the front of the body of a well-developed adult male, with especial reference to the accuracy of the relations of the thoracic and abdominal viscera to the external surface coverings.

PLATE 28.
Front view of a natural (ligamentous) skeleton of a European male, aged thirty-eight years, showing the landmarks with their relations to the surface covering.

PLATE 29.
The anterior wall of the thorax and upper part of the abdomen removed, to show the relations of the heart, lungs, diaphragm, liver, stomach, and spleen to the ribs and their sternal cartilages. The lungs are inflated (as in full inspiration), to indicate the so-called area of the heart's dulness. (From a male subject, about forty years old, with normal condition of the organs.)
N.B.—The subject upon which this dissection was made presented the rare anomaly of a distinct eighth true rib on either side. This is well shown in the plate.

PLATE 30.
The lungs inflated, so as to demonstrate the approximation of their edges over the heart, as in full inspiration.
N.B.—This and the succeeding plates (31, 32, and 33) were taken from a male subject, about thirty-two years of age, who died from choking. The lungs were absolutely healthy. The pleura were removed in the dissection.

PLATE 31.
The relations of the lungs, in moderate distention, to the pericardium, as in ordinary breathing. Also the great vessels and nerves at the root of the neck. The sternum and costal cartilages are removed.
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PLATE 32.
The relations of the lungs, partially distended (as in tranquil respiration), to the pericardium. Also the vessels and nerves at the root of the neck.

PLATE 33.
The relations of the lungs, when completely collapsed, to the heart. Also the deeper relations of the vessels and nerves at the root of the neck. The pericardium is removed, and the ribs sawn through at their middle, to give a better view into the cavity of the thorax. The clavicles also are removed.

PLATE 34.
Preparation to show the relations of the heart within the pericardium.
N.B.—The ribs are cut away, so as to give an unrestricted view.

PLATE 35.
Preparation to show the relations of the heart and the great vessels at the root of the neck. The pericardium is opened and held aside.

PLATE 36.
Dissection of the pneumogastric nerve on the left side, and its relations to the phrenic and sympathetic nerves. (From a female, aged thirty-seven years.)

PLATE 37.
The posterior mediastinum, exposed on the right side by removing the ribs near their angles and drawing forward the heart and lungs, to demonstrate the entrance of the vena azygos major into the superior vena cava, and the distribution of the right pneumogastric and phrenic nerves.

PLATE 38.
The posterior mediastinum and its contents, as seen on removal of the dorsal vertebrae (from the second to the ninth) with portions of their contiguous ribs. The lungs are expanded, so as to show their proper relations posteriorly.

PLATE 39.
View of the thoracic organs from behind, the dorsal vertebrae (from the second to the tenth) with portions of their contiguous ribs removed. The lungs are displaced, to show the relations of the heart.

PLATE 40.
The normal position and relations of the thoracic aorta, seen from behind, the lungs being removed, to show their roots.

PLATE 41.
Figure 1.
The thorax of a young female, with the second, third, fourth, fifth, and sixth ribs removed on the left side, and the left lung drawn aside, to show the relations of the root of the lung and the apex of the heart to the diaphragm.

Figure 2.
Transverse section through the thorax of an adult male, on a level with the lower borders of the third ribs anteriorly and through the body of the eighth dorsal vertebra posteriorly, seen from below.
PLATE 42.
Dissection of the vascular system in a child eight months old, showing the principal arteries and veins in their proper relations and positions.

PLATE 43.
Figure 1.
The front view of the heart removed from the body, with the roots of the great vessels arising from the aorta.

Figure 2.
Section of the right auricle and ventricle, to show the interior of their cavities.

Figure 3.
The posterior view of the heart in relation to the thoracic aorta.

Figure 4.
The posterior walls of the left auricle and ventricle removed, to show the interior of their cavities.

PLATE 44.
Figure 1.
Dissection of the anterior thoracic region, showing the superficial fascia and mammary glands on the left side and the great pectoral muscle on the right. The arms are drawn upward and outward, to bring the axillary borders into prominence and expose their relations to the vessels and lymphatic glands; of importance in operations upon the breast. (From a female, aged twenty-four years.)

Figure 2.
Dissection of the muscles of the shoulder and axilla on the right side. The lymphatic glands and vessels are superposed upon the photograph (from notes of many observations), to show their proper relations.

PLATE 45.
Figure 1.
Dissection of the right axillary space and inner side of the arm, to show the relations of the vessels and nerves.

Figure 2.
Deep dissection of the right axilla and inner side of the arm. The deltoid and pectoralis major and minor muscles are detached and reflected, to show the intricate relations of the brachial plexus of nerves to the artery and veins.

PLATE 46.
Figure 1.
The anterior view of the right elbow and forearm of an adult male, with the superficial fascia carefully removed, to show the relations of the superficial veins and nerves.

Figure 2.
Deeper dissection of same arm as Figure 1. The bicipital fascia and the superficial flexor muscles are removed, while most of the superficial veins are retained, to preserve their relations.

PLATE 47.
Figure 1.
The radial border of the forearm and elbow, showing the relations of the superficial veins—the superficial fascia being carefully removed—to the muscles and tendons.
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Figure 2.
The anterior view of the left elbow, to show particularly the bicipital fascia in relation to the superficial veins and the deep vessels and nerves.

Figure 3.
Dissection of the veins on the back of the hand and forearm, with their relations to the underlying tendons and nerves.

PLATE 48.

Figure 1.
Dissection of the palm of the right hand, showing the superficial layer of the palmar fascia.

Figure 2.
Dissection of the palm of the right hand. The superficial layer of the palmar fascia is hooked aside, to show the deep layer of the fascia and the superficial palmar arterial arch.

Figure 3.
Dissection of the palm of the right hand, showing the position of the superficial arterial arch and the relations of its digital branches to the nerves and flexor tendons.

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Dissection of the palm of the right hand. The tendons are cut away, to show the deep palmar arterial arch and its relations, etc.

PLATE 49.

Figure 1.
Dissection of the muscles of the right forearm and hand in pronation, to show the relations of the extensor tendons of the thumb to the radial artery.

Figure 2.
Dissection of the muscles and tendons of the back of the right forearm and hand in extension.

Figure 3.
Dissection of the tendons of the back of the left hand, showing the relations of the nerves and arteries.

PLATE 50.

Figure 1.
The relations of the structures involved in the operation of trephining the skull, as in a case of cortical epilepsy. The disk of bone has been removed and the pia mater partially detached, to expose the convolutions on the right hemisphere, supposed to include the centre of the movements of the hand, and especially of the thumb.

Figure 2.
Amputation at the left shoulder-joint by the oval-flap method (of Larrey), showing the relations of the parts exactly as they appear after the completion of the operation.

PLATE 51.

Figure 1.
Amputation through the middle of the left arm by the antero-posterior oval-flap method, showing the proper relations of the vessels and nerves to the humerus, in a well-developed man, aged forty-eight years.
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**Figure 2.**
Amputation at the left elbow-joint by the antero-posterior flap method (of Dupuytren), showing the relations of the severed structures immediately after the completion of the operation. The olecranon process of the ulna is retained, to preserve the function of extension of the triceps muscle.

**Figure 3.**
Amputation through the middle of the left forearm by the antero-posterior oval-flap method, showing the relations of the severed structures on completion of the operation.

**PLATE 52.**

**Figure 1.**
The second phalangeal joint of the middle finger of the left hand laid open by an oval incision, as for the anterior flap of an amputation at this joint, to show the relations of the bone surfaces and the adjacent vessels.

**Figure 2.**
The metacarpo-phalangeal joint of the middle finger of the left hand opened, as in the first stage of an amputation (by the lateral-flap method) of the finger, to show the appearance of the ends of the bones at this joint. The position of the joint, on the dorsal surface, before the incisions were made, can be judged by comparison with the adjacent fingers.

**Figure 3.**
Amputation at the carpo-metacarpal joint of the thumb of the left hand (by the flap method), showing the relative positions of the structures severed in the operation.

**Figure 4.**
The wrist-joint of the right hand laid open by an oval incision, as for the dorsal flap in amputation at this joint, showing especially the appearance of the articulation between the lower end of the radius and the semilunar and scaphoid bones.

**Figure 5.**
Vertical section through the articulations at the wrist-joint of the right hand, to show the synovial membranes and the cancellous structure and arrangement of the carpal bones.

**Figure 6.**
The left elbow-joint laid open posteriorly, as in the process of resection or excision of this articulation, to show the relations of the opposing bones and the adjacent structures.

**PLATE 53.**

**Figure 1.**
Topographical survey of the right side of the head, face, and neck, with especial adaptation to cranio-cerebral study, the localization of the areas of distribution of the sensory nerves, and spots where electrical stimulation produces reflex contractions of some of the muscles in these regions. Also the landmarks for the operations of tracheotomy and of laryngotomy.

**Figure 2.**
The left hand in the position of pronation, showing a topographical survey of the areas of distribution of the sensory nerves on the back of the hand and fingers, and spots where electrical stimulation produces reflex contraction of some of the muscles.

**Figure 3.**
The right hand in the position of supination, showing a topographical survey of the areas of distribution of the sensory nerves on the palm of the hand and anterior surface of the fingers, and spots where some of the muscles may be caused to contract by electrical stimulation. Also the surface-markings on the palm of the hand in relation to the arterial arches.