A STEREOSCOPIC ATLAS of HUMAN ANATOMY

DAVID L. BASSETT, M.D.

SECTION IV

THE THORAX

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A STEREOSCOPIC ATLAS

of

HUMAN ANATOMY

by

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SECTION IV

THE THORAX

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On the face of each Reel are two arrows — pointing to a "V," or a "P." These markings allow orientation of the Reel so the first picture will start in proper sequence.

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"P" — For use in a Projector, insert Reel (printing towards you) with the "P" at 12 o'clock.

FOREWORD

Everyone concerned with human anatomy has frequent occasion to refresh his mind on one or another aspect of the subject, but it is not often that he can view the appropriate dissection at a moment's notice. The present atlas makes this possible to a greater degree, and in a more pleasing form, than anything of its kind thus far devised. Here the student or the clinician can review a single dissection, a series of steps in a carefully planned exploratory sequence, the delicate internal architecture of a bone, or an illusive fiber tract, all in full perspective and in the coloring of well-preserved laboratory material.

Adequate labeling is provided in sketches based on tracings of the original photographs, but the views themselves are not marred by pins, numbers or guide lines. It was the purpose to prepare for each view such a careful and informative dissection as a skilled prosector of the old school might have been proud to demonstrate, and then to spare no pains in bringing each structure into full illumination and clear perspective. The success with which these objectives have been attained gives the atlas its unique value.

The excellence of the views in their finished form is due, first of all, to Dr. Bassett's care in selecting and preserving the original material and to his well-planned and skillful dissections, but in no less degree to the work of William B. Gruber who has combined unusual ability and extensive experience in scientific color photography to produce stereoscopic pictures almost completely free of shadows and reflections, with beautiful depth perspective and extraordinary illumination of deep-lying structures, recesses and foramina. One of the two colored views of each dissection was enlarged and traced to scale. The tracings were then given adequate shading and a full set of labels which make it possible to identify all the major structures seen in the colored views.

In preparing the several sequences, the same subject was used so far as possible for all successive dissections in each series. This gives the individual runs a unity that otherwise they might lack and permits sufficient overlaps to provide an adequate orientation in passing from one view to the next. Where unexpected anomalies were encountered, or alternative dissections were called for, supplementary views are intercalated.

The atlas has a further advantage in being based entirely on new material, thus avoiding many of the errors which invariably creep into printed volumes. Labeling, of course, may involve a certain amount of interpretation and, within limits, even dissections sometimes betray the influence of preconceived ideas, but here every effort has been made to show natural relations exactly as they were found in the parts dissected. Unusual

procedures and special techniques are resorted to only when they clearly add to the adequacy of the presentation. The professional anatomist will find in these views many of the satisfactions of a fresh dissection of his own, but with each step preserved at the point of its greatest perfection and not lost in the preparation of deeper structures. The surgeon and internist should find the compactness of form, easy accessibility and clarity of detail a real convenience when a quick review of topographical relations is desired. For the student the views will serve not only as an atlas but as an indication of what he himself might hope to accomplish in his own dissections.

Most teachers of anatomy agree that there is no adequate substitute for actual dissection, nor for the detailed descriptions in the standard texts, but few teachers and fewer students fail to appreciate the value of plates and even diagrams as aids in fixing anatomical relationships in the mind. These views will serve that purpose admirably, but they will go beyond the usual mnemonic devices in providing a realistic picture that can not be achieved by two-dimensional drawings or diagrams. Moreover, unlike diagrams, the views do not call for reinterpretation. Beginning students will probably find it expedient to use the individual reels one at a time, studying the views at home, or taking them to the laboratory where they can serve the purpose of well-planned prosections or be used for comparison with dissections currently in progress. They may then be kept as convenient and immediately available records or reminders of the ground that has been covered. If desired, they may be regrouped to meet the immediate needs of the user, for which purpose the very complete index will be found helpful.

For further details the reader must be referred to the atlas itself. It may be noted in passing, however, that there is enough plasticity in its organization to permit the addition or substitution of new views when they become available. As it stands the atlas may be commended to students, teachers and practitioners as a concise, accurate and graphic survey of human anatomy, skillfully executed and artistically presented.

C. H. DANFORTH.

PREFATORY NOTE

Since A Stereoscopic Atlas of Human Anatomy is an undertaking of considerable magnitude and obviously cannot be completed in a short time, it has seemed advisable to publish the several sections of the work as they are finished. This, of necessity, will require some repetition in the explanatory remarks for each section as it appears. As stated in the preface to Section I, The Atlas is organized by regions of the body (with the exception of Section I, The Central Nervous System) and the structures, insofar as they can be explored by dissection, are presented in stereoscopic, Kodachrome photographs. Sections dealing with the abdomen, pelvis, lower extremity and back are in preparation and will be published in the order mentioned. The present Section covers the thorax and, incidentally, includes some consideration of the shoulder girdle, back and neck.

The line drawings have been prepared for the purpose of labeling structures visible in the dissections. A scale is included in each case to provide a measure for individual structures as well as for the entire field of view. Measurements were made in the foreground of each dissection. Obviously the scale does not apply with absolute accuracy to objects in the background, modified in proportion, as they are, by the effect of perspective.

The N.A. terminology, adopted by the Sixth International Congress of Anatomists meeting in Paris in 1955, is used in this Section and will be employed hereafter. This system, which represents a moderate revision of the B.N.A., is a definite improvement over the older terminology and yet there remain a few discrepancies which require qualification. Specific terminological problems are considered in the Introduction to each Section. In instances where the N.A. fails to provide a needed term a suitable English name has been introduced. The viewer will have little difficulty, it is hoped, in understanding the Latin forms and the meaning of other terms employed.

To prevent discoloration of the tissues by diffusion of blood pigments the blood was washed out of the vessels with saline solution prior to embalming each specimen. However, no attempt was made to duplicate the colors of tissues as they appear in the living state, although brain and connective tissues retain much of their original hue. Fixation of the specimens

by perfusion with Jores' fluid and later preservation by further steps in Jores' method has aided in maintaining good color contrasts.

Most arteries were filled with natural latex colored red, or, in some cases, their outer surfaces were colored in similar tones. Veins were filled with blue latex, usually by retrograde injection. In parts where valves were present the complete injection of veins was sometimes impossible. In such instances the outer surfaces of the vessels were colored blue. Lymphatic vessels were not injected or tinted artificially but can be recognized by their amber color. All specimens have been preserved in a fluid which contains a small amount of glycerin. At the time of photography the excess moisture was permitted to dry, sometimes giving rise to a slightly glossy or waxy appearance of the surfaces which in no way affects the specimen itself. All of the views are of actual human tissues, not of models.

DAVID L. BASSETT, M.D.

November, 1957.

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The author wishes to express his sincere gratitude to those who have contributed much of their time and skill in helping to solve the problems encountered in the preparation of this section of the Atlas.

It is a special privilege to thank Mr. William B. Gruber whose accomplishments are responsible for the form in which the photographs appear. His expert knowledge of stereoscopic photography and his boundless enthusiasm continue to be a real inspiration. Dr. C. H. Danforth has given valuable counsel in matters of terminology and, in this connection, has corrected the manuscript with meticulous care. Dr. Donald J. Gray has been of much help in settling terminological problems. Dr. W. W. Greulich, as executive head of the Department of Anatomy, has cooperated heartily in the furtherance of the work.

Mrs. Lorene Sigal has prepared the line drawings for Section IV, a task which has required great skill and patience.

Dr. Charles Duisenberg and Dr. Sydney F. Thomas have generously provided several radiographs. Mr. Frank Barrett prepared the radiograph of injected coronary vessels (119-7).

Drs. Burt L. Davis, Robert L. Dennis and Robert D. Dunn have rendered valuable assistance on several occasions.

Mr. William L. Butler has made many excellent suggestions with regard to the format and organization of the Atlas.

The author is especially indebted to Sawyer's Inc., the publishers. They have provided an excellent medium for the presentation of this Atlas. Moreover, their understanding and cooperation has been abundantly evident in every phase of the task.

INTRODUCTION TO SECTION IV

The views which comprise this section visualize the thoracic wall, the thoracic viscera and, to some extent, the structures of the back. Neighboring parts of the neck, the upper limb and the abdominal wall have been included where necessary in the presentation. A more comprehensive study of the back is the subject of a separate section of the Atlas.

As has been customary in previous sections, the osteological material is presented first. Radiographs have not been grouped together as has been done previously, but have instead been dispersed in appropriate locations among views of related subjects.

The sequence of dissections is initiated with the exploration of the anterior and lateral parts of the chest wall, including the breast. Following this are several views of the thoracic viscera *in situ* and a serial dissection of the heart *in situ*. Detailed views of dissections of isolated hearts appear next in order. The lungs are then illustrated, first as isolated whole organs, and then in a series of dissections of the bronchial and vascular structures of the various lobes *in situ*.

The mediastinum and its contents, exclusive of the pericardium and heart, are the subjects of the subsequent group of dissections. Views of the mediastinum also logically extend to such paravertebral structures as the sympathetic trunks, the azygos and hemiazygos veins, the intercostal arteries and regional lymphatic structures. Dissections of the diaphragm are pictured next in order.

The thorax is approached from a posterior direction in the concluding series of dissections. Illustrative views of dorsal musculature, vertebral articulations, spinal cord and the origins of spinal nerves in the thoracic region are included. Views of the pleura and the relations of the thoracic viscera as seen from the posterior aspect complete the section.

The N.A. terminology, which appears in this Atlas for the first time with the publication of this section, is an improvement over the older B.N.A. in many respects. Of particular note here is the inclusion of detailed terms to describe the segmental bronchi and vessels within the lungs. The author has taken the liberty of including several terms in their Latin form which were omitted from the N.A. (i.e., fascia infraspinata, n. subcostalis, trigonum deltoideopectorale). Exception has also been taken to the fact that the anterior and posterior cusps of the tricuspid valve have been listed in the N.A. as ventral and dorsal cusps.

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