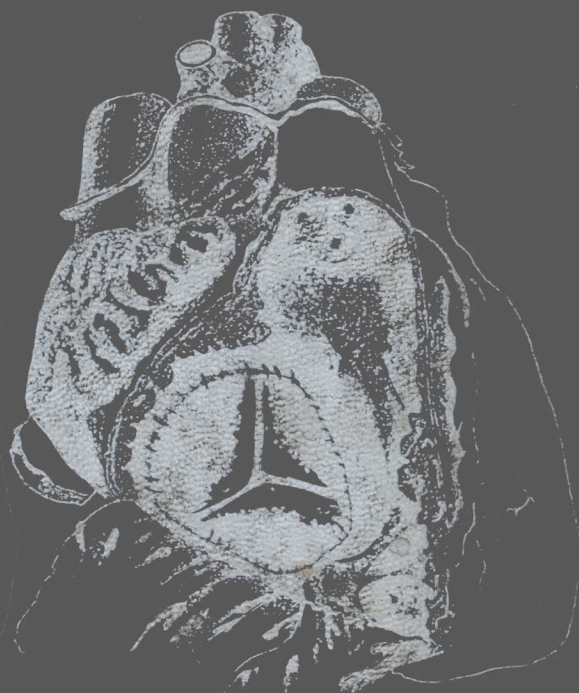


volume 1

textbook of clinical anatomy

N.J. GROBLER



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Volume 1

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INTRODUCTION

Progress usually leads to change. Never before has progress in the science and practice of medicine made more vital demands on a working knowledge of the structure of the living human body than now. The impact of the great strides in medical knowledge has led to widespread curricular revisions and progressive reappraisal of the habitual teaching of gross anatomy in order to meet the demands of the progressing clinical disciplines.

Anatomy introduces and prepares the student to deal with the patient of today and tomorrow and it is an established tenet of medical education that anatomy forms the foundation of clinical medicine, however, since the knowledge of such a vast amount of factual data must be acquired during such a short period, the dedicated teacher in human anatomy today is faced with two important questions viz. firstly, *how much*, relative to other demanding disciplines and secondly, in *what form* should human anatomy be taught. However, in face of the rapid advances the structure of the human body remains the same and it is a universal consensus that without structure, no function is possible; it thus follows that the science and practice of medicine are unlikely to be served by teaching less anatomical structure. On the other hand, systematic organization of a mass of material forms an impeccable aid to the learning and comprehension of a subject as human anatomy. It follows therefore, that advances in the efficiency of presentation of the voluminous anatomical factual data, may promote clarity of communication, interest and apprehension to secure a working knowledge of and an appreciation for the structure of the human body.

Furthermore, it has been proved that nothing stimulates the dedicated medical student more than to correlate the anatomical facts with a judicious application to the patient — since, all disease is the outcome of some disorder or other in the normal functioning of — structure whether gross, microscopic or molecular. Furthermore since so many clinical problems require a sound anatomical knowledge for their solution it has been found and underlined by clinicians that the anatomy habitually taught is too detailed, ill-related and too far removed from the anatomy one needs to know in clinical practice. It has therefore been attempted to bridge this unfortunate hiatus by a discrete introduction of a text which integrates the preclinical laboratory science of anatomy with the clinical disciplines.

The text presents by means of a consistent methodical approach the structure of the human body systematically described, simplified, illustrated, related and correlated with clinical medicine. Those anatomical features which are of particular importance in *all*

branches of medicine, are emphasized and the significance or influence of anatomical knowledge on medical practice, is outlined and illustrated throughout the text. To make the study of the structure of the human body and the relationship of its constituent parts to each other more meaningful and rewarding, some of the most common disturbances, derangement or impairment of each structure or part, are briefly described, and since operative techniques are based on a sound knowledge of anatomical structure, reference has been made throughout the text, where felt necessary to the most common operations some of which are briefly described so that the reader, whether preclinical or postgraduate, can build or revise the picture of the structures and their relationships.

Believing that a picture is sometimes worth a thousand words many illustrations have been included designed to illustrate and illuminate the text. Since certain aspects of normal anatomical structures and the various disturbances or malformations which are described, are comprehensible only when there is a background of knowledge in histology and or embryology, constant reference is made to histology and a brief description of the development is included at various places in the text. The most common congenital anomalies, deformities, variations and impairment of almost every structure or part of the human body, are briefly described and references are included for further study if necessary. Since every physician should be able to interpret normal radiographs, radiological interpretation and evaluation of the various parts of the body have been emphasized and illustrated. Anatomy is a new language for the student and most anatomical terms have Greek or Latin roots and consequently convey very definite meanings. Therefore, the word roots, prefixes and suffixes derived from Greek and Latin are explained and most of the unfamiliar words are translated or defined with a view to clearness and completeness of understanding, and since it is agreed that each language group may use the vernacular as it deems proper, many names or expressions have been replaced by direct English translation.

This textbook of clinical anatomy is a direct outcome of experience gained in clinical medicine and lectures in anatomy to preclinical and postgraduate students.

The text has been divided into two volumes: volume 1: 'The thorax, abdomen, and pelvis'; and volume 2: 'The extremities, back, head and neck'.

This subdivision was intended to serve the following purposes: (a) to prevent a single volume from assuming too large a proportion, so that it can be used readily, (b) to allow for the acquisition of only one volume for those who are interested only in a certain part, eg., the extremities or the abdomen, and (c) to allow the beginner to acquire an early sound basis for study of other preclinical and clinical subjects: by beginning with the thorax followed by the abdomen and pelvis, the student is quickly introduced to the organs of respiration and circulation and the digestive and urinary systems all of which receive early attention in most physiology courses either preclinical or postgraduate; moreover it results in an early acquaintance with the peripheral and autonomic nervous systems.

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N. Grobler

Plate I

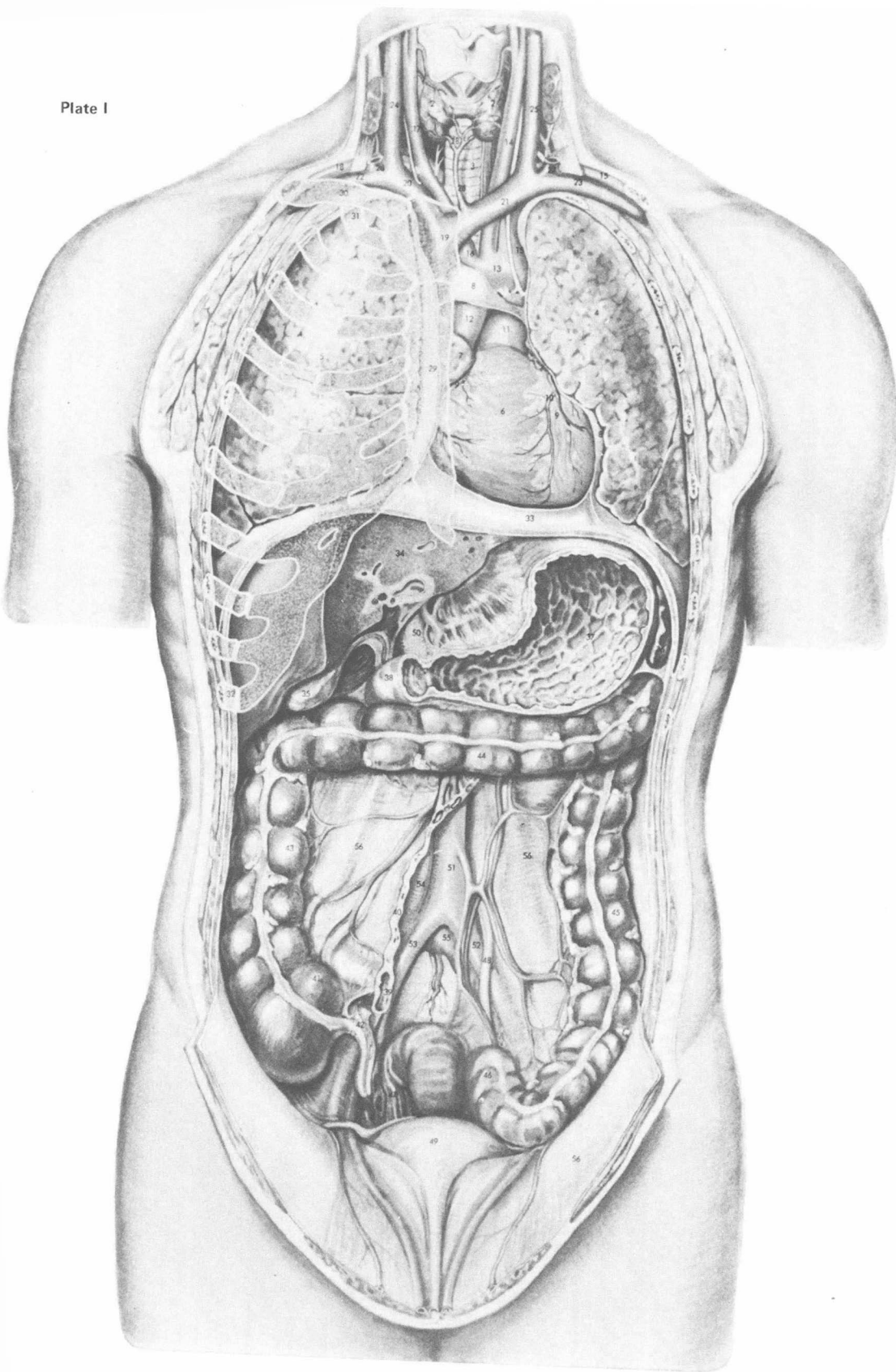


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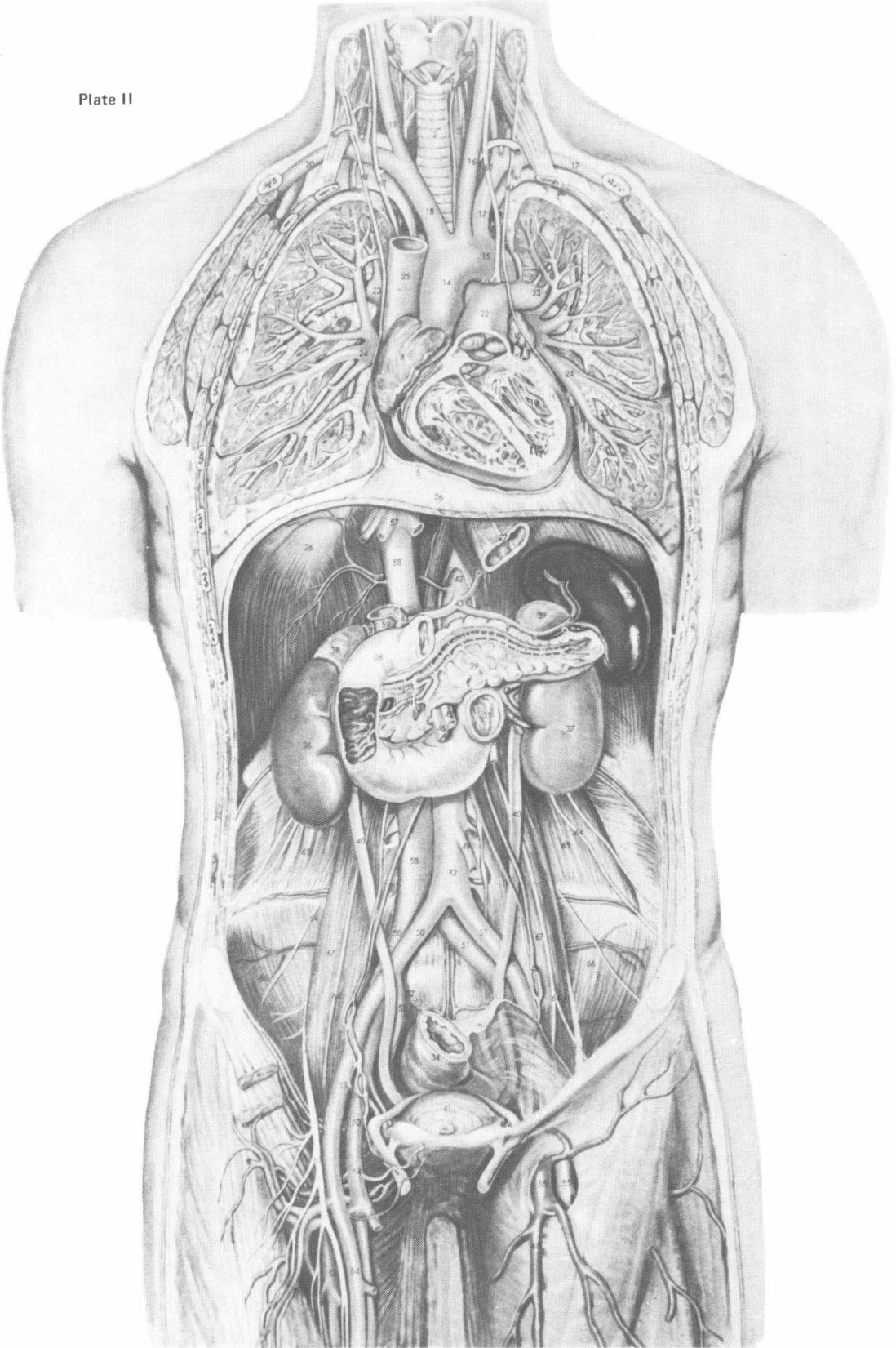


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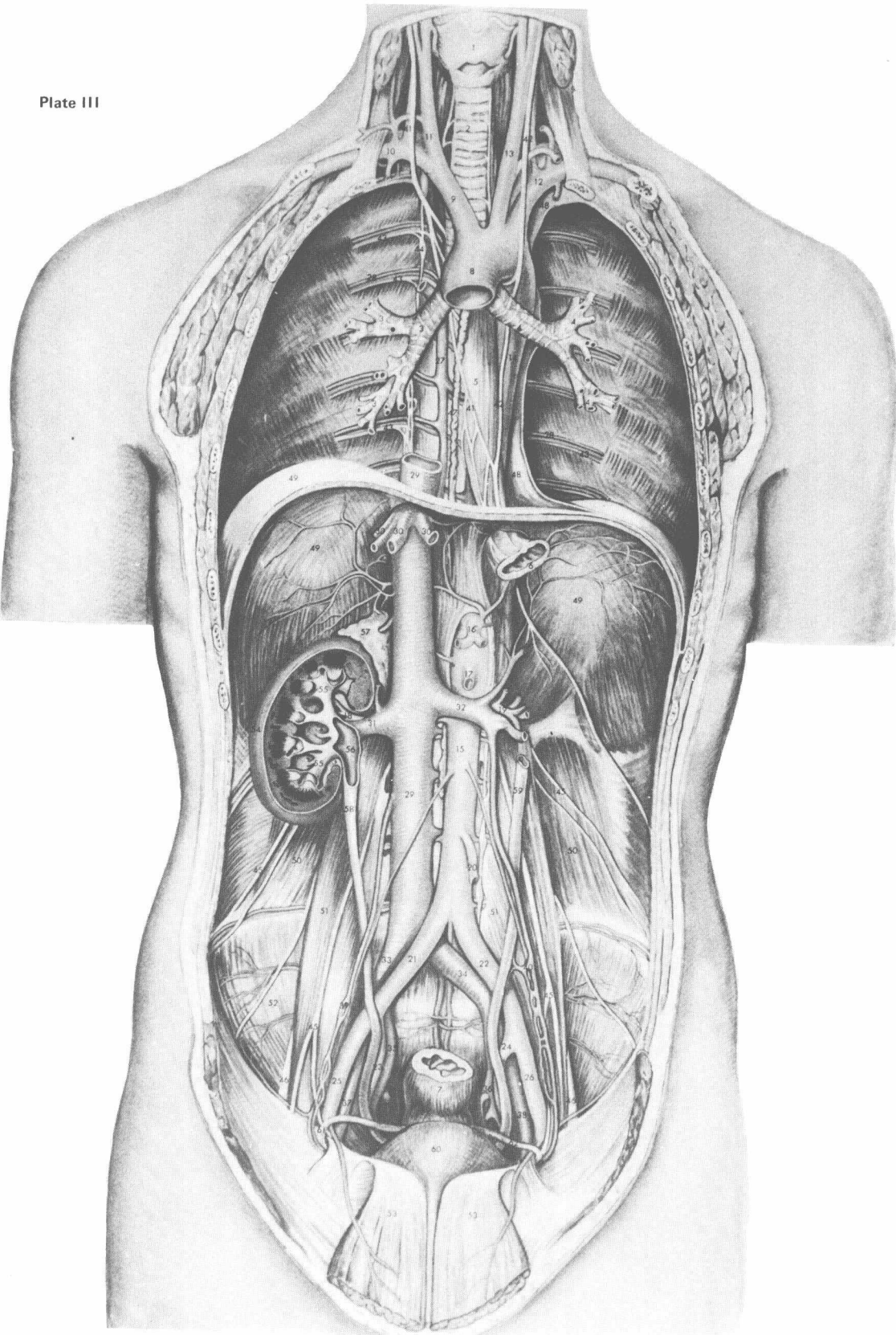
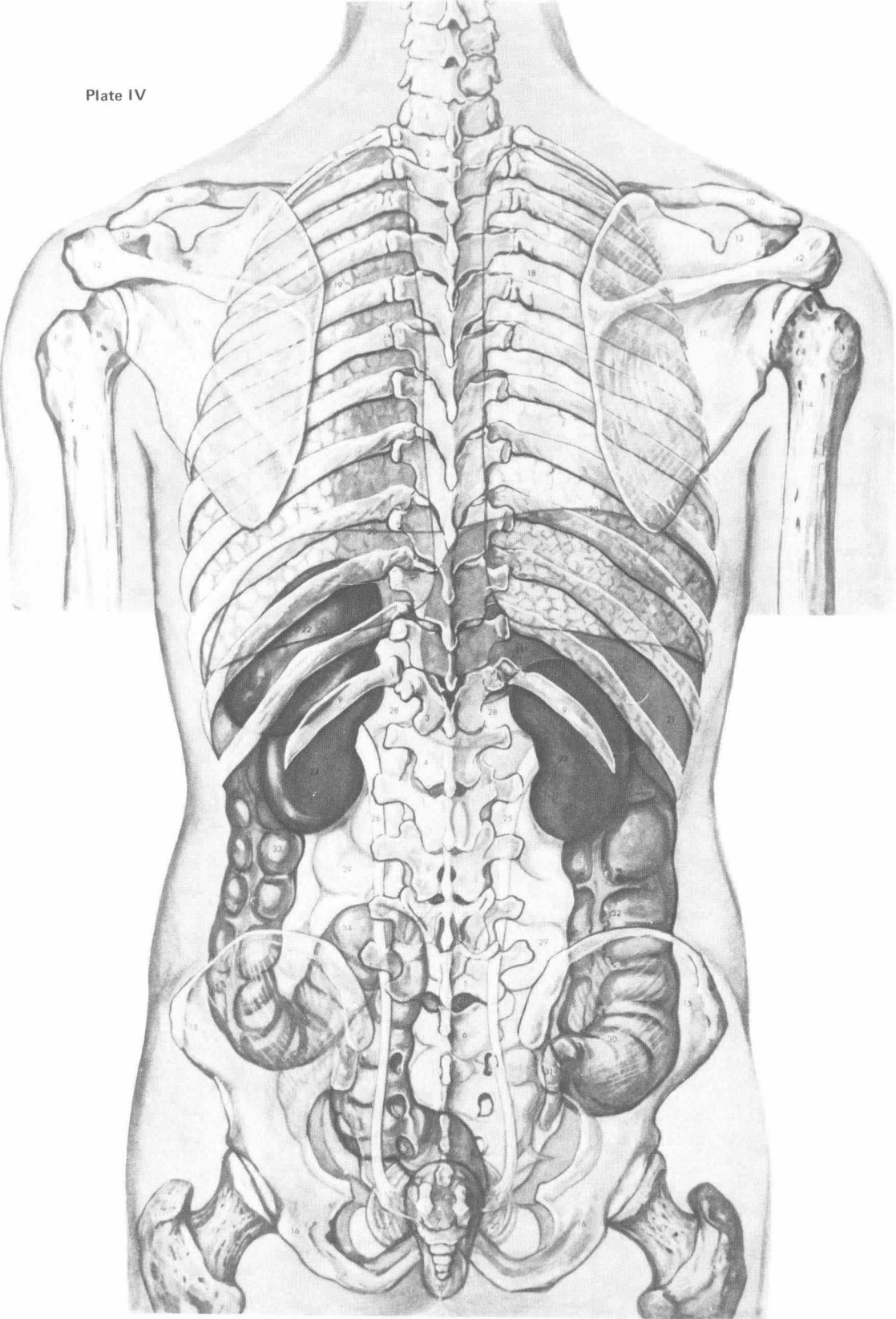


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THORAX

For purposes of description, the thorax, which is the region between the neck and the abdomen, can be divided into:

I. The thoracic wall and II. The thoracic cavity with its contents.

THE THORACIC WALL

The thoracic wall is formed by:

an osseocartilaginous framework or skeleton:

anteriorly: one sternum, 12 pairs of ribs and costal cartilages (fig. 1)

posteriorly: 12 thoracic vertebrae with the intervertebral discs and the posterior parts of the ribs (fig. 2).

musculomembranous parts (fig. 3):

the suprapleural membrane superiorly

the diaphragm inferiorly

the intercostal muscles and the fascia endothoracica;

the parietal pleura, which forms the innermost lining of the thoracic wall (see p. 50)

– is covered: on the outside by skin, fascia and muscles

– provides attachment for muscles of the chest, the upperlimb, the abdomen and the back

– serves as the expansile but rigid walls of a bellows-like chamber, the interior capacity of which is alternately enlarged and reduced

– contains and protects the main organs of respiration and circulation, i.e. the lungs and heart with the great vessels leaving and entering

– assists in supporting the abdominal viscera

– allows structures to enter and to leave the thoracic cavity.

The shape of the framework, forming the thoracic wall, is conical, narrow above and broad below. It is flattened from before-backwards, longer behind than in front. The transverse diameter of the ADULT chest is about $\frac{1}{4}$ greater than the anteroposterior dimension, its greatest width being at the 9th rib. In the infant, and young child, the anteroposterior and transverse diameters are about equal.

The thoracic vertebrae cause an indentation of the thoracic cavity from behind, giving it a kidney-bean appearance on cross section.

Like any other part of the skeleton, the thorax displays variation in dimensions and proportions which are partly individual and also limited to age, sex and race e.g. in the female, the capacity is usually less, the sternum relatively shorter, the thoracic inlet more oblique and the upper ribs are more movable than in males.

For *clinical purposes* the following regions can be distinguished (fig. 4): I. the thoracic inlet region (apertura thoracica superior); II. the sternal region; III. the costal region; IV. the thoracic outlet region (apertura thoracica inferior); V. the mammary region.