ORAL ANATOMY

SICHER

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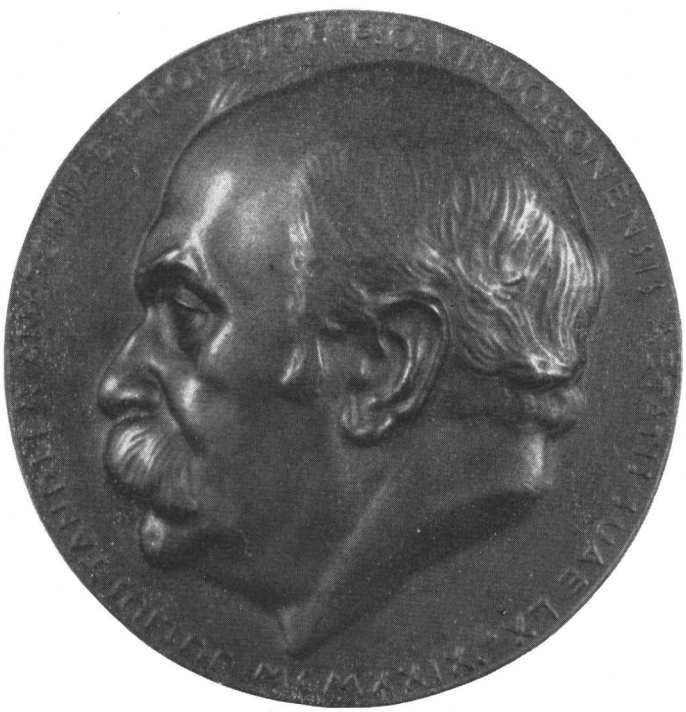

JULIUS TANDLER (1869-1936)

To the Memory of
JULIUS TANDLER

PREFACE AND POSTSCRIPT

One of the most difficult problems in teaching anatomy, or any of the other basic sciences, in a dental school is that of correlation. Most students never become aware of the applicability of theory to practice. This failure is due in some degree to the arrangement of the schedule. When the student is taught anatomy he cannot apply his knowledge because he has as yet to learn the fields in which, as the teacher insists, anatomic knowledge is indispensable. When, two years later, the student starts his clinical education, he cannot apply anatomic knowledge because he has retained at the very best a few fragments of memorized chapters. Time is running out and a review of anatomic details in a course of applied anatomy is almost impossible. As a consequence, clinical teaching and learning are more and more mechanized and the student arrives at the conclusion that he can become a successful dentist without much knowledge in basic sciences. The incoming freshman succumbs only too easily to the whispered temptation not to take the basic science courses too seriously, and a vicious circle has been closed.

This book tries to bridge the gap between theory and practice and to prove that anatomic understanding does not only facilitate clinical work but that it also allows for the substitution of a rigid clinical technique by an adaptable and therefore potentially progressive action.

The *Oral Anatomy* is not intended to replace but to supplement textbooks on dental anatomy or textbooks on human anatomy. The latter are written primarily for the use in medical schools and the chapters on the regions of head and neck, that are the domaine of dentist and oral surgeon, are at the same time too broad and not deep enough. In addition, applied anatomy for the dentist and oral surgeon can hardly be touched, even if applied anatomy is given some space.

Though it is impossible and not even desirable to avoid practical remarks in the descriptive chapters, applied anatomy is dealt with in a separate, second part of the book. Here the principle of arrangement is the clinic and not the regional division of the human body.

In many chapters the boundaries of pure anatomy have been transgressed where for instance surgical technique is touched upon to show that it can be developed as a logical consequence of anatomic study.

I have omitted references to the innumerable original papers and to the many textbooks that are the fountain of our anatomic and clinical knowledge. A list of references could only contain selections and I think that each teacher would prefer to assign reading material that he personally thinks instructive. If the omission of references seems unfair to all those whose labor went into the writing of this book, it deprives at the same time the author of the quotation of his own works, a habit in which authors so often and so deeply indulge.

The *Oral Anatomy* is intended to replace selected chapters of a textbook of anatomy in the freshman course, but also to accompany the student through his clinical years and to serve as a basic introduction to many practical courses.

This book is based on a German text that was written in collaboration with my teacher and friend, Dr. Julius Tandler. For almost thirty years his Department of Anatomy in the Vienna University was a center for the study of applied anatomy. Surgeons, internists, gynecologists, urologists, neurosurgeons, otologists and laryngologists, and dentists and oral surgeons were steady and welcome visitors who asked for advice and, in asking, stimulated new research. For all I received in almost thirty years of helping to forge the links between anatomy and clinic, the dedication of this book to the memory of Julius Tandler is only a small token of gratitude.

H. S.

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The illustrations for the *Oral Anatomy* are in part photographs, in part original drawings. The photography was in the hands of my trusted friend, M. P. Orlopp. The majority of the drawings are the work of Miss Elizabeth Story, Assistant Curator of the Division of Anatomy in the Chicago Natural History Museum, three paintings were done by Mrs. E. Orban, and two drawings I owe to Dr. E. L. Du Brul, of the College of Dentistry, University of Illinois. To all of them I want to express my sincere thanks.

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CONTENTS

PART ONE

DESCRIPTIVE ANATOMY

CHAPTER 1

CHAPTER 2

CHAPTER 3

CHAPTER 4

CHAPTER 5

CHAPTER 6

CHAPTER 7

PART TWO

REGIONAL AND APPLIED ANATOMY

CHAPTER 8

CHAPTER 9

CHAPTER 10

CHAPTER 11

CHAPTER 12

CHAPTER 13

CHAPTER 14

CHAPTER 15

LIST OF ILLUSTRATIONS IN COLOR

ORAL ANATOMY

Part One
DESCRIPTIVE ANATOMY

Chapter 1

THE SKULL

INTRODUCTION

Phylogenetically the skeleton of the head can be traced back to primarily independent parts. The first, neurocranium, protects the brain and forms capsules for the organs of seeing, hearing, and smell. The second, splanchnocranium, surrounds the cranial parts of the respiratory and digestive tracts. In higher animals this division can be only diagrammatic because these two parts fuse in a static and functional sense into one unit. Moreover, the nasal cavity has become, in higher vertebrates, not only an organ of smell, but also the beginning of the respiratory tract after its separation from the primitive oral cavity. What one calls in man and mammals the facial skeleton is not identical with the splanchnocranium.

Primarily, the neurocranium forms the posterior and dorsal, the splanchnocranium, the anterior and ventral parts of the skull, just as, in the trunk, the spinal cord, even in higher mammals, is situated dorsally and the viscera ventrally to the axial skeleton. The ever greater expansion of the brain is responsible for a change in the relation of neurocranium and splanchnocranium in the course of evolution, so that the splanchnocranium is more and more overgrown by the neurocranium. In man, finally, the neurocranium alone forms the cranial end of the body (Fig. 1).

The final and decisive changes in the skull of man are related to the acquisition of the upright posture which necessitated a strong curvature of the skull around an axis passing through the two acoustic organs. These final changes can still be seen by comparing the most highly developed apes with the lowest types of man and by following through to recent man. This phase in evolution did not merely bring about a change in the position of the two parts of the skull and a gradual enlargement of brain and, therefore, brain capsule, but also a gradual decrease in size of the facial skeleton mostly as a result of reduction of the masticatory apparatus.

It is interesting to note that, in this respect, phylogenetic and ontogenetic changes are not parallel. The primitive races of man, Pithecanthropus of Java and Sinanthropus of China, possessed a powerful and protruding masticatory skeleton which was gradually reduced in relative size in the Neanderthal man and his successors. On the other hand, the human newborn infant is characterized by the enormous preponderance of the neurocranium over the splanchnocranium which is almost concealed below the bulging forehead.