

**HUTCHINSON'S PHYSIOLOGICAL
SERIES. LESSONS IN
PHYSIOLOGY AND HYGIENE: IN
TWO BOOKS. FIRST BOOK FOR
ELEMENTARY GRADES, PP. 1-221**

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J.C. HUTCHISON'S PHYSIOLOGICAL SERIES

LESSONS
IN
PHYSIOLOGY AND HYGIENE
IN TWO BOOKS

FIRST BOOK
FOR ELEMENTARY GRADES

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Preface

THIS work has been designed for use in Intermediate and Grammar Schools for the purpose of teaching the first rudiments of physiology and hygiene. The aim has been to present in an attractive and simple manner the fundamental principles by which health is maintained. Necessarily, in a work so elementary as this, only an outline-sketch of anatomy and physiology can be presented, but enough of these sciences will be found to make the subjects clear and comprehensible. All scientific terms have been avoided, and only familiar language has been used, so that the youngest pupil may read and understand it.

The effects of alcohol and narcotics have been most carefully considered, and the facts presented in this connection are in accordance with the latest scientific conclusions. The requirements of all state laws relating to the teaching of these subjects have been fully met. One fourth of the entire text of the book has been devoted to

the consideration of alcohol and narcotics. At the end of each chapter will be found a statement of the effects of alcohol, tobacco, and other narcotics on the different organs or parts of the body.

Acknowledgments are due Miss Clara F. Hall of Brooklyn, N. Y., for her valuable aid in the preparation of this book.

LESSONS IN PHYSIOLOGY AND HYGIENE

FIRST BOOK

CHAPTER I

THE FRAMEWORK OF THE BODY

1. **THE HUMAN BODY.**—The human body is the dwelling-place upon earth of that part of us that lives and loves forever and ever,—the soul. Is that difficult for you to understand? You know that you have arms, hands, feet, eyes, ears, and many other parts of the body. You know if you lose a finger, an arm, or a leg that *you* remain. A part of the body may be lost because of an injury; but the part that makes you *you* and *no one else*, the *soul*, remains in the body as long as it is a suitable dwelling-place for it.

2. The body is full of wonders, full of beauty. There are the strong, hard parts, and the delicate,

soft ones. But all parts, strong and delicate alike, are perfectly planned for the support, preservation, and enjoyment of life. As the *bones* are essential to each and all of these purposes, it is fitting that we should begin the study of the human body with a description of them.

3. **THE BONES AND THEIR USES.**—The bones form the framework of the body. We depend upon them for strength in our arms, legs, and back, and for protection to the lungs, stomach, brain, and other soft parts of the body. The more delicate the organ, the more completely does Nature shield it. For example: the brain, which is soft in texture, is enclosed on all sides by the skull; the eye, though it must be near the surface of the body in order that we may see well, is sheltered from injury by the skull and the bones of the face; the lungs, requiring freedom of motion as well as protection, are surrounded by the movable *chest*, composed partly of bone and partly of muscle.

4. **THE SIZE AND SHAPE OF THE BONES.**—The size and form of the bones vary greatly in different parts of the body. There are, however, but three general classes: the *long* bones, such as those of the limbs; the *short*, as in the wrist; and the *flat*, like the shoulder-blade. The long bones are com-

monly round and hollow at their middle portion, as greater strength is furnished by the same amount of material, if it is in the form of a tube, than if it is a solid pillar of the same length.

5. **THE STRUCTURE OF BONE.**—Let us examine one of the long bones after it has been sawed through lengthwise (Fig. 1). We notice the hollow central cavity, containing an oily substance called the *marrow*. We find that the outer surface is hard like ivory, and is pierced here and there with small openings for the admission of blood-vessels. The interior, especially at the ends, is comparatively light and porous. So that, although a bone be as hard as stone outside, it is by no means as heavy. If a thin section of bone be examined under the microscope, we discover that it is pierced by numerous fine tubes (Fig. 2). By means of these



FIG. 1.—SECTION OF BONE.