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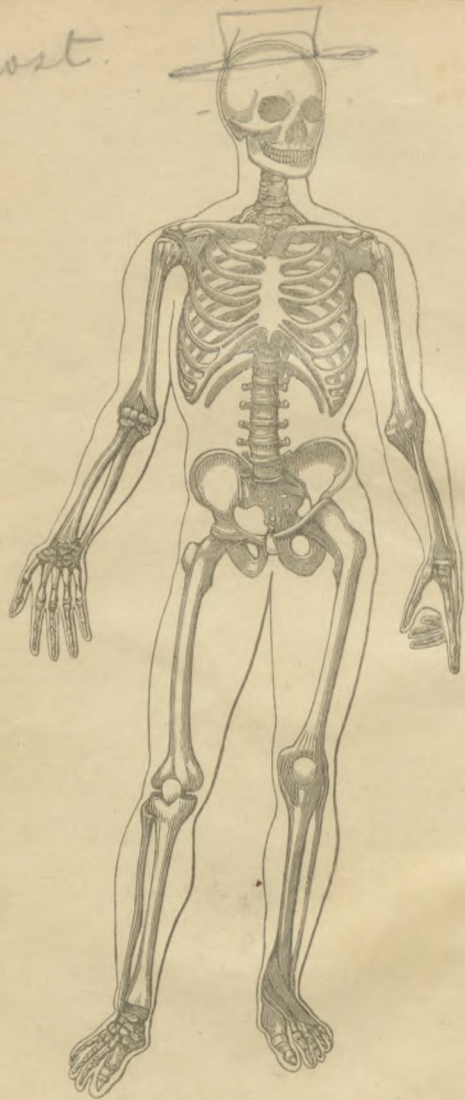
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SKELETON.

THE OUTER LINES SHOW THE FORM OF THE HUMAN BODY WHEN THE SKELETON IS CLOTHED WITH FLESH.

LESSONS

ON

THE HUMAN BODY.

An Elementary Treatise

UPON PHYSIOLOGY, HYGIENE, AND THE EFFECTS  
OF STIMULANTS AND NARCOTICS ON  
THE HUMAN SYSTEM.

BY

ORESTES M. BRANDS,

PRINCIPAL OF GRAMMAR AND PRIMARY SCHOOL No. 4,  
PATERSON, N.J.



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## PREFACE.

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THE formidable size and ponderous character of many books placed in the hands of children have been prolific sources of discouragement of effort, and, not infrequently, causes for dislike and neglect of important and interesting studies.

These simple Lessons on the Human Body are specially designed to present subject-matter in such quantity and of such quality as shall make it *possible and probable* that the young student may "make its acquaintance."

It is confidently believed that the arrangement of the material will at once commend itself to the teacher. Attention is respectfully directed to the following features; viz., —

1. Short, complete lessons.
2. The systematic division of each lesson that describes an organ into three distinct topics, — *Position, Construction, Work.*
3. The arrangement of the entire text in short, numbered paragraphs, each stating an important fact briefly.

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the humerus and the partial cup of the ulna, allowing a gliding motion in such a way that the palm of the hand may turn in different directions.

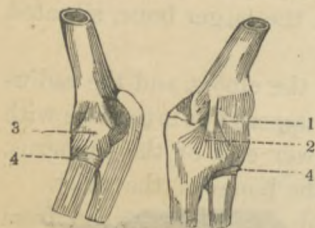


FIG. 8.

## EXPLANATION OF FIG. 8.

Short ligaments of the elbow are here demonstrated. The wonder is, how the elbow-joint can ever be dislocated without entirely ruining the whole ligamentary arrangement. The figures from 1 to 4 not only give the locality of each ligament, but even the figure.

2. The elbow-joint permits motion in two ways, *i.e.*, backward and forward, and a rotary motion of the lower arm.

## Lesson XVIII.

## THE WRIST.

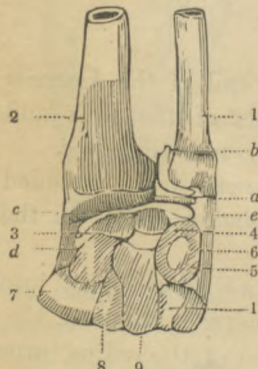


FIG. 9.

## EXPLANATION OF FIG. 9.

This diagram shows the connection of the little bones of the *carpus*, or wrist, with the two long bones of the fore-arm.

- 1, the *ulna*.
- 2, *radius*.
- 3, *scaphoides*.
- 4, *lunare*.
- 5, *cuneiforme*.
- 6, *pisiforme*.
- 7, *trapezium*.
- 8, *trapeziodes*.
- 9, *magnum*.

The letters mark the ligaments which tie them together.

(a) **Position.**—1. The *wrist* is located between the arm and the hand.

(b) **Construction.**—1. The wrist, or *carpus*, consists of eight very irregular bones, arranged in two rows.

2. One of these rows articulates with the bones of the arm; the other, with the bones of the hand.

## EXPLANATION OF FIG. 10.

Another plan of the bones of the wrist, showing them placed in two rows. This is a back view of the *carpus* of the right hand.

*a*, the *boat-shaped bone*;  
*b*, the *half-moon shaped*;  
*c*, the *wedge-shaped*;  
*d*, the *pea-shaped*; which make the upper row, joining the fore-arm.

In the second row are the four others, *e, f, g, h*, which are united by a joint to the palm of the hand.

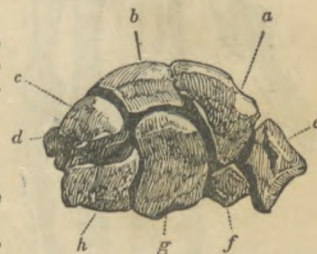


FIG. 10.

3. The bones are held so firmly together by ligaments that they are seldom displaced.

(c) **Work.**—1. The wrist, being an *arthrodial* joint, permits motion in three directions, — upward, downward, and a gliding movement from side to side.

2. The arrangement of these bones, while not allowing a freedom of motion equal to that of a ball-and-socket joint, combines great strength with elasticity.

**Remarks.**—The carpal bones are not often broken, it requiring great violence to fracture them. Their rough surfaces are well adapted for the attachment of ligaments that bind the bones of the wrist, arm, and hand together.

Ami  
 Julia  
 Com. Semitsa

## Lesson XIX.

## THE HAND.

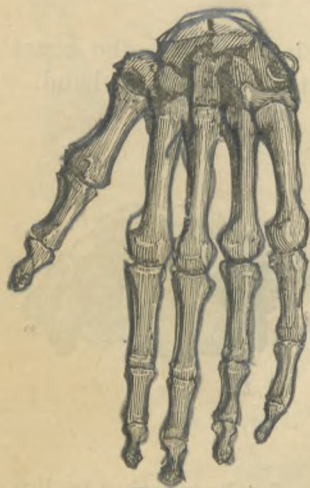


FIG. 11.

## EXPLANATION OF FIG. 11.

Here is presented a back view of all the bones of the hand as they are connected with the eight little bones of the wrist. Each bone is so distinctly represented, that a very young child may understand the arrangement.

(a) *Position*.—1. The bones of the palm of the hand, *metacarpus* (*meta*, beyond, and *karpos*, wrist), articulate with the bones of the wrist. The metacarpal bones are five in number in each hand.

2. Each of the bones of the palm articulates with a thumb or a finger, the bones of which are named *phalanges* (the plural of *phalanx*, meaning a rank). The metacarpus and phalanges comprise the bones of the hand.

(b) *Construction*.—1. The bones of the palm ar-

ticulate at one end with the bones of the wrist, and at the other with the bones of the fingers.

2. The first bones of the fingers are so joined to the palm of the hand as to permit the motion of a hinge-joint, and also of a sidewise motion. The other bones of the fingers form simple hinge-joints.

3. The first bones of the thumbs are not connected with the others of the fingers, and have a freedom of motion peculiar to themselves.

4. There are three bones in each finger, and but two in each thumb.

(c) *Work*.—1. The hand is beautifully and skillfully arranged, and adapted to an almost infinite variety of purposes.

2. The numerous joints of the fingers, and the varying length of their bones, enable them to fit the hollow of the hand when it is closed, and to grasp objects of varying size, from a fine needle to a large bar of iron.

*Remarks*.—The hand in its perfection belongs to man alone. Its wonderful structure is suited to obey the requirements of the mind which directs it, and gives to man a superiority over all other animals; for none other is equipped with an instrument so fully capable of performing the great variety of motion and work.

The hand is not only a wonderful instrument of motion, but it is also the chief organ of touch or feeling. And what a delicate instrument it is for this purpose! Completely formed even in infancy, it presents a most interesting model, and an inexhaustible subject of study to the artist.

*Setia*

Lesson XX.

BONES OF THE LOWER EXTREMITIES.

- a. The bones of the lower extremities are, viz.,<sup>1</sup>—
1. The *femur*, or thigh-bone . . . . . 2 bones.
  2. The *patella*, or knee-pan . . . . . 2 bones.
  3. The *tibia*, or shin-bone . . . . . 2 bones.
  4. The *fibula*, or smaller bone of the lower leg . . . . . 2 bones.
  5. The *tarsals*, or bones of the instep . 14 bones.
  6. The *metatarsals*, or bones beyond the instep . . . . . 10 bones.
  7. The *phalanges*, or bones of the toes . 28 bones.
- Total . . . . . 60 bones.

Lesson XXI.

THE HIP AND KNEE.

(a) *Structure of the Hip-Joint.*—1. The *femur* (Lat. for the thigh), or thigh-bone, articulates with the hip-bone (pelvis), and forms a ball-and-socket joint.

2. In each side of the pelvis is a deep socket, into which the upper end of the femur fits snugly. A strong ligament, attached to the ball-like end of the

<sup>1</sup> The number of bones given above includes both of the legs.

femur and to the centre of the socket, binds the bones together.

3. So tightly does the femur<sup>1</sup> fit in the deep socket, that the pressure of the air holds it in place even after the flesh is removed, and considerable force is required to separate the ball from the socket.

EXPLANATION OF FIG. 12.

We have here an excellent representation of the upper end of the *femur*, or thigh-bone, and half of the *pelvis*. The ball, or head, of the femur, supported by a neck which forms an obtuse angle with the body of the bone, is fixed in the socket of the *os innominatum*, filling the cavity, but not all enclosed by it. The depth of the socket is only about half the diameter of the ball.

- a, the *os innominatum*, or hip-bone.
- b, the head of the *femur*, or thigh-bone.
- c, the rim of the socket.
- d, the *femur*.
- e, the *sacrum*.
- f, the point of bone on which we sit.

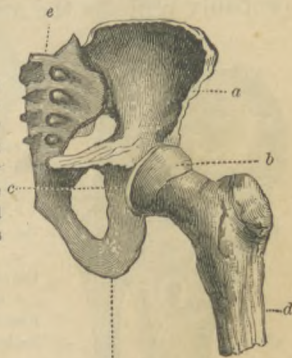


FIG. 12.

(b) *Work.*—1. The hip-joint is similar to the shoulder-joint, and permits movement of the leg in every direction.

(c) *Construction of the Knee.*—1. The lower end of the *femur* joins the upper end of the *tibia*, and forms the hinge-joint known as the knee-joint.

2. The *patella* (that is, a little dish), a chestnut-shaped bone, is firmly fastened over the joint in front. It protects and strengthens the joint.

<sup>1</sup> The femur is the longest and strongest bone of the body. It bears the entire weight of the parts above it at every step.

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D. L. L.



