ANATOMY AND DRAWING

Victor Perard
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PREFACE TO THE FOURTH EDITION

It has long been known that the study of anatomy leads to the appreciation of form and beauty in art. The human figure is particularly rewarding for study. It has simplicity and beauty of form. It is so balanced and proportioned that it can do much with little effort.

For these reasons, human anatomy is taught in schools of fine arts throughout the world.

The student who buys a book on drawing anatomy needs to have this important subject explained to him as simply as possible.

This Fourth Edition of ANATOMY AND DRAWING, including new material on the muscles, has been prepared from this point of view. The human figure is presented in a series of simple diagrams from which all but the necessary naming of parts and
Anatomy and Drawing

actions has been stripped. The wording is printed in clear juxtaposition to the identified body parts. Skeleton figures or quick body sketches demonstrate actions.

Throughout the book, I have kept the text to the essential minimum and have adhered to the wisdom of the saying, "One picture is worth a thousand words."

September 1955

VICTOR PERARD

PREFACE TO THE THIRD EDITION

The purpose of this book is to present in a simple and direct manner the subject of anatomy as it is applied to Art. As little text as possible has been used, and much dependence has been placed on pictorial representations because the latter are a more direct means of impressing the artist with construction and form. For this reason this work has been copiously illustrated, often showing various views of the same structures and actions.

To the beginner the study of anatomy is too often dull, prosaic and difficult and this is due, in large part, to the fact that many text books on the subject contain insufficient descriptive drawings. Even though the student plows through many pages of text, he often fails to visualize the subject properly. Therefore it has been endeavored to substitute illustrations for descriptive text whenever practical. The drawings have been arranged in groups for the purpose of comparison, and in this way the eye becomes accustomed to observe much which otherwise might escape attention.
Preface

To express outward form correctly requires a knowledge of the internal structure, that is, of the bones which compose the framework and define its proportions and of the muscles and tendons which direct its action.

Every figure artist finds sooner or later, as he advances in his artistic career, that his work needs strengthening through a well grounded knowledge of anatomy. The great masters of the past realized this and their grasp on the fundamentals of anatomy is reflected not only in their finished works, but in such of their preliminary sketches as are still preserved.

The ability to construct figures correctly from the imagination rather than to depend entirely on models is a distinct aid to the draftsman and to the sculptor. The student of anatomy should therefore test his skill by making memory drawings and by applying his knowledge to compositions of his own fancy.

When working from living models, the artist will find that his knowledge of anatomy will enable him to analyze and interpret the forms before him in a more understanding way than he could without such information. It will develop in him greater powers of observation. An understanding of anatomy is an instrument in the mechanics of Art: a means to be employed to assist but never allowed to dominate. The artist must learn properly to evaluate his anatomical information and to know the part it is to play in the development of his art. The studies he makes will then be done more intelligently and with better draftsmanship as an inevitable result.

Victor Perard
NOTES ON PROPORTION

Since proportion is the comparative relation of one thing to another, some standard or unit of measure must arbitrarily be established. In Art, this unit is known as the "head" which is the distance from the top of the skull to the tip of the chin. The illustrations in this book are based on the proportion of seven and a half "heads" to the height of an erect figure. The use of this standard will obviate much descriptive text. It is well, however, to bear in mind that this standard of proportion is modified by such elements as race, sex,
Anatomy and Drawing

age and physical differences peculiar to the individual. For this reason the following notes on proportion are grouped under the heads: Male, Female, Children and General Observations.

Proportions of the Male. The greatest width of the male figure is at the deltoids, a little below the shoulders and the width here is about two heads.

The width between the hips should equal one and one half heads, and the width between the nipples one head.

The height of the figure, seven and one-half heads, should approximate one "head" for the head, two and three-quarter heads for the neck and trunk, and three and three-quarter heads for the lower extremities.

From the finger tips to the elbow should measure two heads.

Proportions of the Female. The bones of the female are shorter and have less rough surfaces than those of the male. The sternum or breast bone is shorter and more curved and the pelvis is broader and shallower which gives a greater width to the hips. The sacrum is wider and projects at an angle backward.

The posterior superior iliac spines and the anterior iliac spines are further apart than those of the male. The distance from the rib cage to the pelvis is greater due to the shallower and broader pelvis.

There is less distance from the crest of the iliacs to the great trochanters of the hips, because the anterior iliac spines are spread out and lower, and further apart. In the female figure the Poupart's ligaments and the furrow of the groin are more horizontal.

The shoulders are narrower and the collar bones (clavicles) straighter and shorter thus giving a more graceful and longer neck and more sloping shoulders in comparison with the square shoulders of the male.
Notes on Proportion

The arms are shorter in proportion to the trunk which is due to the shorter humerus bone of the female, and because the humerus bone is shorter, the elbow is higher.

Variations in the length of the female leg are more frequent than those of the trunk and so it is more difficult to judge the height of the female figure when seated. But the length of the torso is proportionately longer than in the other sex. The legs are shorter and the skull smaller.

The center of the female figure is above the pubic bone while in the male, the center is about at the pubic bone. The width of the female hips is about the width of the chest wall plus that of one arm and is greater than that of the male of the same height. The fact that the female sacrum is at a greater angle than that of the male and that there is more fat on the buttocks gives these a greater diameter.

The female abdomen, is more rounded and the thighs are thicker from the back to the front than in the other sex.

Proportions of Children. The child of three is about one half the height of the adult, and at ten, about three-quarters the height of the adult. As the child grows older the relative sizes of the head and the trunk change. At twenty-five the figure is full grown.

At birth the center of the figure is a little above the navel, at two years at the navel and at three years the center is level with the iliac bone.

With advancing age this point gradually lowers depending to a great extent on the length of the legs.

General Observations. The clavicle bone continues to grow for a considerable period after the other bones of the body have attained
Anatomy and Drawing

their full development and therefore the shoulders are said to broaden.

Only very tall people have a height of eight heads. Short people are seven heads or less. The muscles of the adult account for about one half the weight of the body.

The skeleton always provides the proportions of the figure with slight allowances for the padding between the joints, between each vertebra, and under the heel and foot. In old age the figure shortens due to the hardening and shrinking of the cartilages between the bones.
PART ONE

PROPORTION and DRAWING
Some of the mechanical principles of the human frame

Weight of head 12 in. = 25 lbs.

Height of pelvis
1 head.
The sacrum performs the function of a keystone in the arch of the pelvis.

The feet placed together form an arch.

The bones of the foot are so arranged as to form a springy arch.

The astragalus bone acts as a keystone to the arch of the foot.

The skeleton in simplified form to illustrate curves which deflect shocks and give springiness to the frame.
Expressing action by simplified skeleton
METHOD OF DRAWING
From Life or from the Cast

1. Find the center of the paper by drawing lines from corner to corner. This is done to help center the study.
2. Measure with the eye or pencil to find the center of the subject and make a line at that point as related to the center of the paper. Draw a line at the head and another at the feet. With free lines search for the rhythm of the pose, to help visualize the figure and to place it on the paper the size intended. Draw lightly so that the mental impression of the figure is not obliterated by a heavy drawing, and corrections can be easily made.
3. Decide where the pit of the neck should be placed and draw a perpendicular line from this point (if a front view) to the feet. If a back view, draw the perpendicular line from the seventh cervical vertebra to the feet. Find the line of the shoulders, giving the angle of their positions. If a standing figure, first draw the leg on which there is most weight, to obtain the proper balance of the figure.
4. Give the line showing the angle of the position of the pelvis. Indicate a line through the knee-caps. Draw the torso, indicating its bulk, marking the width of shoulders, hips, neck and head. Block with straight lines going beyond the intersections to obtain a better idea of the direction of line and to avoid a cramped feeling.
5. Sketch within the lines a simplified skeleton, to check up on position of joints and bulk of chest. (Refer to pages on proportion.) See that the pit of the neck, the pubic bone, the navel, the pelvis, the knee-caps and the inner ankles are in proper relation to each other. Compare relative sizes of head to bulk of torso, hands to face, feet to hands, arms to legs, and thickness of the neck to that of the head, leg and arm.
6. Go over the outline, perfecting it, searching for character and for grace of line.
7. Indicate the outline of the planes and of the principal shadows.
8. Fill in the planes in large surfaces, and connect the shadows as much as possible.
9. Without losing their mass, model the planes keeping well in mind the direction of light. In drawing the head, decide on the bulk and draw in the planes of the face (see Part III), then the eyes, the mouth and the nose last. It is easier to fit a head on a figure, than to fit a figure to a head.
In quick sketching the points used to define proportions should be carefully marked. Then essential lines (often continuous) drawn. Other lines indicated with strict economy.

Speed should be acquired through judgment, not haste.
Aids to quick sketching.
Indicate the angle of the shoulders, then the line of gravity, then express the pose with as few lines as possible.

For line of gravity in back view, draw a vertical line from back of the neck.
Five minute sketches for quick decision of action and proportions
Studies of economy of line
Studies for the value and economy of line
Twenty-five minute sketches
Sketches of boy three years old
PART TWO

THE SKELETON
Two views of the same skeleton

The spine from the front
Studies of the Spine
Anatomical diagram of the human skeleton, including labels for various bones such as Scapula, Sternum, Clavicle, Mandible, Cervical Vertebrae, Thorax, Humerus, and more. The diagram also includes views of the male and female skeletons, with labels pointing to specific bones like Femur, Pubis, Patella, and Metatarsals.
PART THREE

THE HEAD and NECK
The SKULL

Frontal bone
Parietal bone
Temporal bone
Nasal bone
Zygomatic bone
Zygomatic arch
Malar or cheek bone
Mastoid process
Ramus of lower jaw
Angle of lower jaw

Intra orbital foramen

Mandible

Parietal bone
Superciliary arch

Temporal bone

Mastoid process
Angle of jaw

Zygomatic bone
Anterior nasal spine
Laminar fossa

Mental foramen
Skin folds over frontalis muscle in action

Skin folds are at a right angle to the pull of the muscles

Anterior auricular superior

Posterior

Skin folds over pull of trapezius

Levator palpebrarum superiors

Orbicularis palpebrarum (in action)

Shrinkage of the orbicularis oris in expression of whistling

Levator labii superioris alaeque nasi (in action)

Levator labii

Loose skin

Digastric & Mio-hyoid/pulling jaw

Frontalis

Pyramidalis

Compressor naris

Levator labii superioris

Orbicularis palpebrarum

Zygomaticus minor

major

Orbicularis oris

Buccinator

Risorius

Depressor labii inferioris

Depressor anguli oris

Digastri

Mylo-hyoid

Sterno-hyoid

Omo-hyoid

Sterno-mastoid

Temporal

Masseter

Splenius

Digastric

Stylo-hyoid

Middle constructor

Levator scapula

Omo-hyoid

Scalenus medius

Scalenus anterior

Trapezius
Muscles of the face in action.
All muscles act by shrinkage.

The underlying and the superficial muscles of the face and neck.
Method of blocking the planes of the face
Illustrating the modifications of the planes of the face when the head is turned in different positions.
The oval is often used as a basis for giving the general outline of the head.

Imaginary lines will help to place the features in their proper relation and to give convexity to the head.

Showing changes in the relative proportions of features and skull at different ages. The nose gradually straightens, then lengthens; the ears lengthen; the eyes are placed higher.
Attachment of muscles on upper surface of clavicle

- Pectoralis major
- Deltoid
- Sterno-mastoid
- Trapezius
- Scapula side

Attachment of muscles on under surface of clavicle

- Clavicular ligament
- Trapezius
- Scapula side
- Subclavus
- Pectoral major
- Deltoid

Attachments of muscles (Top view)

- Serratus magnus
- Serratus posterior
- Serratus magnus
- Scalenus medius
- Scalenus anterior
- First rib
- Sternum bone
- Sterno-mastoid
- Second rib
- Scapula
- Pectoralis minor

Clavicle in perspective

- Sternum side
- Levar scapula

Rhomboïd minor

Rhomboïd major

Clavicular origin

Trapezius

Steno-mastoid clavicular origin

Back of scapula

Showing attachment of muscles

- Hyoid bone
- Pomum Adami
- Thyroid cartilage
- Crico cartilage
- Thyroid gland
- Trochlea
Top view of clavicle showing attachment of muscles.
Muscles of back of neck

Action of No. 1

Action of No. 2

Action of No. 3

Action of No. 4

Levator scapula
Rhomboid minor

Rhomboid major

Complexus
Small splenius

Complexus
Splenius

Splenius of neck

Complexus
Splenius

Levator scapula
Rhomboids

No. 3

No. 4
The Neck

- Trapezius
- Omo-hyoid
- Sterno-mastoid
- Scalene anterior
- Medius
- Posterior
- Hyoid bone
- Eumenum Adam
- Thyro-hyoid
- Cricoid cartilage
- Scapula
- Clavicle
- First rib
- Second
- Stylo-hyoid
- Digastric
- Thyroid gland
- Sterno-thyroid
- Clavicle
- First rib
- Scalenus anterior
- Medius
- Posterior
Modification of chest form in breathing

Relation of head and neck to shoulders in extreme side movements

Flexion of head without moving neck

Extent of bending forward and back
PART FOUR
THE TORSO
Side inclination of body increased by shifting the pelvis from horizontal to oblique position.

Group of erector spinae muscles stretched, permitting spine to show.

Ilio-femoral ligament prevents excessive extension backward.
Supinator longus
Extensor carpi radialis longus
Extensor carpi radialis brevis
Extensor communis digitorum
Abductor pollicis longus
Extensor pollicis brevis
Extensor pollicis longus

Trapezius
Deltoid
Infra-spinatus
Teres minor
Teres major
Triceps

Extensor carpi ulnaris
Extensor digiti quinti
Flexor carpi ulnaris

Extensor pollicis longus
Extensor pollicis brevis
Abductor pollicis longus
Anconeus
Extensor communis digitorum
Extensor carpi radialis brevis
Biceps
Gluteus medius
Gluteus maximus

Tensor femoris

Gastrocnemius
Soleus
Peroneus brevis
Peroneus longus

Gastrocnemius
Soleus
Peroneus brevis
Peroneus longus

Sartorius
Arrector pennis
Adductor magnus
Semi-tendinosus
Semi-membranosus
Gastrocnemius
Soleus
Flexor longus
Flexor digitorum
Tibialis anterior
MUSCLES OF THE BACK

- Levator scapula
- Rhomboideus major & minor
- Trapezius
- Infra-Scapular
- Teres major
- Deltoid
- Triceps
- Latissimus dorsi
- Complexus muscle
- Splenius muscle
- Scapula
- Erector spinae
Infra-spinatus.
Latissimus dorsi
Erector spinae (covered by latissimus dorsi and trapezius)
Trapezius
Ligamentum nuchae
External oblique
Rectus abdominis
External oblique
External oblique No. 1
Transversus abdominis underlying No. 1
No. 2
Internus abdominis
Underlying No. 2
No. 3
Male Pelvis
Front view

Iliac crest
Anterior superior iliac spine
Iliac portion of os innominatum
Pubic portion of os innominatum
Acetabulum hollow for head of femur
Spine of pubis
Ischium
Pubic arch
Posterior superior spine

Male Pelvis
Back View

Anterior superior iliac spine
Sacrum
Coccyx
Spine of ischium
Tuberosity of ischium

Male
Female
Body of pubic bone

Male
Female

Showing female bone tilted forward
Difference of height and breadth
Pelvic bone in various positions

- Front from below
- Front
- Side & back
- Side view
- Three quarter view within
- Three quarter back
- Within
- Lying down
- Looking within
- Under view
- Three quarter from below
- Side
- Three quarter back
Types of female torso

Straight torso

Tilted pelvis

Skin folds in bent torso

Iliac furrow

Resting on one leg

Skin folds of groin (male)

Skin folds of groin (female)

Male-folds of the groin - female
Sectional diagrams of male torso
PART FIVE

THE ARM
The Humerus bone of right arm

- Head
- Greater tuberosity
- Lesser tuberosity
- Bicipital groove
- Intermuscular groove (briceps)
- Insertion of deltoid
- Front
- Side
- Deltoid insertion
- Back

- External condyle
- External condylar ridge
- External condyle ridge
- External condyle
- Capitellum where head of radius articulates
- Olecranon fossa
- Coracoid fossa
- Internal condyle
- Intermuscular septa are attached to these ridges
- External condyle
- Olecranon fossa
- Internal condyle
- Trochlea for articulation with ulna
- Trochlea

- Supraspinatus
- Latissimus dorsi
- Pectoral major
- Teres major
- Deltoid
- Coraco-brachialis
- Supinator longus
- Brachialis anticus
- Extensor carpi radialis longus
- Extensor group and pronator teres
- Flexor group

- Infraspinatus
- Teres minor
- Triceps outer head
- Deltoid
- Brachialis anticus
- Middle head of triceps
- Extensor group
- Anconeus

End view

Showing attachment of muscles
Bones of Arm and Hand
Radius and Ulna bones

Relations and foreshortenings of radius and ulna
Various Views of Clavicle and Scapula
Studied of shoulder girdle, grouped for comparison
Emaciated figure
Showing change of angle of scapula with movement of arm

Trapezius

Trapezius ending at the last thoracic vertebra

Insertion of deltoid

n biceps

Sternomastoid

Brachialis anticus

Triceps

Deltoid

Infra-spinatus

Teres minor

Teres major

Latissimus dorsi

Atlas

Humerus

Scapula

7\textsuperscript{th} Cervical vertebra.
PART SIX
THE HAND
Acromion process

Clavicle

Humerus

Coraco brachialis

Pectoral minor

Biceps tendons

Shoulder right side

Capsule articularis of head of humerus

Front view of left arm bones

Ligaments binding bones of the wrist

Back view of left arm bones
Back view of wrist

Annular ligament: Sectional view of wrist bones

Keystone of arch

Flexor tendons passing under the arch of the wrist bones.

The arch formed by the group of wrist bones with the ligament binding the two hook like processes. This forms a canal through which the tendons of the flexor muscles pass.

The back of the hand becomes more convex as it nears the wrist.
The lengths of A and B together, equal the length of C

The thumb reaches the second joint

When the hand is resting on a flat surface, the wrist does not come in contact with that surface.

The wrist bones are grouped far into the wrist forming the arch of the wrist.

Woman's hand
Relative positions of the bones from the little finger side when the hand is resting on a flat surface.
Showing the use of imaginary lines to obtain proportion
Studies of hands with use of imaginary lines for proportion
Children's hands
PART SEVEN

THE LEG
Front of femur
Right leg

Front of patella
Upper border
Articular surface
Right patella

Back of right femur

Left femur
Outer view
Inner view
Studies of Leg bones
The Knee Joint

Patella
Patella ligament
Fibula
Tibia
Femur bone

Right leg, front view
Right side
Left side

Front
Knee bent
Right side
Knee bent
(ligaments)
Knee bent

Back view of joint
Right leg
Showing ligaments

Anterior cruciate ligament
Fibula collateral ligament
Tendon of biceps of leg
Patella (removed)

Front view left leg bent
Muscles of the calf of leg

- Tibialis posterior
- Plantaris
  Overlying the Soleus muscle
- Soleus
  Underlying Gastrocnemius

- Insertion of Tibialis posterior
- Flexor hallucis longus
  Insertion base of phalanx of big toe

Tibialis posterior
- Gastrocnemius
PART EIGHT

THE FOOT
PART NINE

THE ECORCHE

AND MUSCLES OF THE BODY
ANATOMY AND DRAWING
Victor Perard

This instructive book presents excellent annotated line drawings of anatomical structure for the beginning artist. Explaining the subject in simple terms and with an extensive series of dynamic illustrations, the author identifies parts of the body and demonstrates a wide array of physical activities through his sketches.

Following notes on proportion and drawing, chapters cover the human skeleton, head and neck, torso, arm, hand, leg, foot, and musculature. Numerous illustrations depict various views of these structures, movements of the human figure, as well as changes in the relative proportions of features at different ages.

One of the best books in its field, Anatomy and Drawing helps demystify a complex subject by enabling students to visualize the muscles and bones under the skin, and covers just about everything a beginner needs to know about drawing the human anatomy.


ALSO AVAILABLE

AN ATLAS OF ANATOMY FOR ARTISTS, Fritz Schider. 593 illustrations. 192pp. 7½ x 10¼. 20241-0
ANATOMY FOR ARTISTS, Diana Stanley. 112pp. 6¼ x 9¼. 42981-4
DRAWING THE LIVING FIGURE, Joseph Sheppard. 177 illustrations. 144pp. 8½ x 11¼. 26723-7

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