



LESSONS FROM MICHELANGELO

Figure Drawing Based on Techniques of the Master BY MICHAEL BURBAN



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BY MICHAEL BURBAN

I want to thank everyone
involved in creating this book.
I am sincerely grateful to
Donald Holden, Mary Suffudy,
and Candace Raney for their
wisdom and guidance.

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TO ALL THE ARTISTS OF THE WORLD
AND THE MODELS WHO POSE FOR THEM

CONTENTS

INTRODUCTION

CHAPTER ONE

The Underlying Structure of Form 10

- PRELIMINARY SKETCHES 11
- INDICATING FORM WITH LINE 12
- THE SHAPES OF FORM 14
- THE SKELETAL FRAMEWORK 16
- PROPORTIONAL SYSTEMS 20
- PROPORTIONS USED BY RENAISSANCE ARTISTS 22
- DESIGNING FORMS 24
- SIMPLIFYING COMPLEX FORM 26

CHAPTER TWO

The Head and Neck 28

- MASSING THE HEAD 29
- POSITIONING THE HEAD IN SPACE 30
- PROPORTIONAL SYSTEMS: FACIAL FEATURES 32
- DEFINING THE FEATURES WITH LIGHT AND SHADE 34
- THE RELATIONSHIP OF VALUE TO LINE 36
- SHAPING THE NOSE AND MOUTH 38
- THE MUSCLES OF EXPRESSION 40
- THE FORMS OF THE NECK 44
- THE STERNOCLEIDOMASTOID MUSCLE 46

CHAPTER THREE

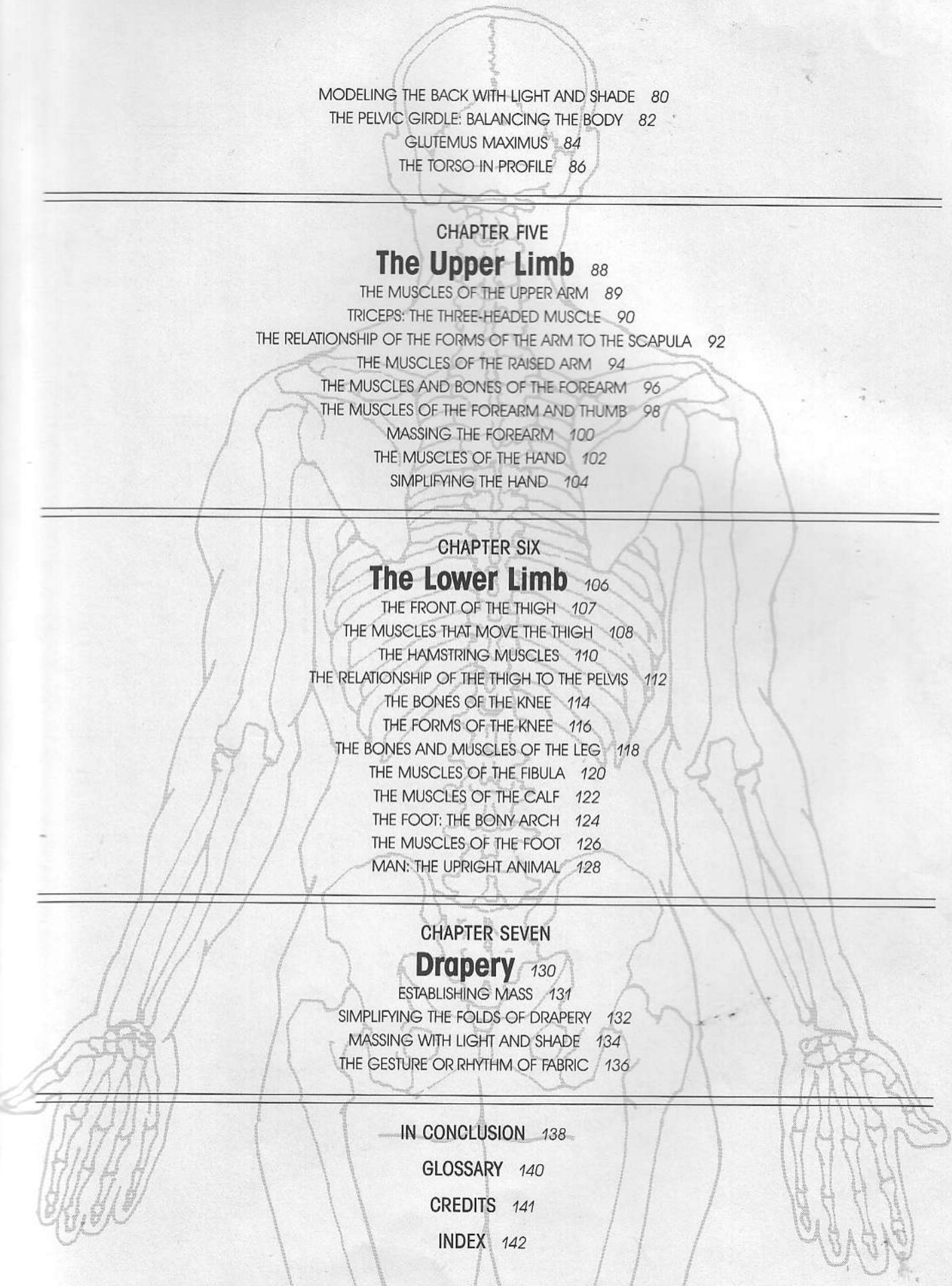
The Torso: Anterior Region 48

- PLACING THE LARGE MASSES OF THE BODY 49
- POSITIONING THE RIB CAGE IN SPACE 52
- THE PLANES OF THE TORSO 54
- THE SHOULDER GIRDLE 56
- THE FORMS OF THE CHEST 58
- OVERLAPPING FORMS OF THE TORSO 60
- THE RECTUS ABDOMINUS MUSCLE 62
- THE EXTERNAL OBLIQUE 64
- THE FOLD OF THE GROIN 66
- VARIATIONS OF FORM: MALE AND FEMALE 68

CHAPTER FOUR

The Torso: Posterior Region 70

- SIMPLIFYING THE FORMS OF THE BACK 71
- DEEP MUSCLES OF THE BACK 72
- THE SCAPULA AND ITS MUSCLES 74
- THE TRAPEZIUS MUSCLE 76
- LATISSIMUS DORSI 78



MODELING THE BACK WITH LIGHT AND SHADE	80
THE PELVIC GIRDLE: BALANCING THE BODY	82
GLUTEMUS MAXIMUS	84
THE TORSO IN PROFILE	86

CHAPTER FIVE

The Upper Limb 88

THE MUSCLES OF THE UPPER ARM	89
TRICEPS: THE THREE-HEADED MUSCLE	90
THE RELATIONSHIP OF THE FORMS OF THE ARM TO THE SCAPULA	92
THE MUSCLES OF THE RAISED ARM	94
THE MUSCLES AND BONES OF THE FOREARM	96
THE MUSCLES OF THE FOREARM AND THUMB	98
MASSING THE FOREARM	100
THE MUSCLES OF THE HAND	102
SIMPLIFYING THE HAND	104

CHAPTER SIX

The Lower Limb 106

THE FRONT OF THE THIGH	107
THE MUSCLES THAT MOVE THE THIGH	108
THE HAMSTRING MUSCLES	110
THE RELATIONSHIP OF THE THIGH TO THE PELVIS	112
THE BONES OF THE KNEE	114
THE FORMS OF THE KNEE	116
THE BONES AND MUSCLES OF THE LEG	118
THE MUSCLES OF THE FIBULA	120
THE MUSCLES OF THE CALF	122
THE FOOT: THE BONY ARCH	124
THE MUSCLES OF THE FOOT	126
MAN: THE UPRIGHT ANIMAL	128

CHAPTER SEVEN

Drapery 130

ESTABLISHING MASS	131
SIMPLIFYING THE FOLDS OF DRAPERY	132
MASSING WITH LIGHT AND SHADE	134
THE GESTURE OR RHYTHM OF FABRIC	136

IN CONCLUSION 138

GLOSSARY 140

CREDITS 141

INDEX 142



INTRODUCTION

One day while viewing a drawing show I had an experience that affected me deeply. As I casually walked through the room, I saw a drawing I couldn't take my eyes off, and all the other drawings seemed shallow and undistinguished by comparison. That drawing was a nude study by Michelangelo. Although I had been familiar with Michelangelo's work all my life, it seemed that only now, perhaps because of my education and training, was I receptive to his interpretations of the figure. In fact, it was as if I had never seen them before and that nothing could be more exciting than to be in the presence of high Renaissance art and finally have eyes that could see it!

Since that day, I have been thoroughly involved in the process and magic of drawing the figure. My increased knowledge has never destroyed the spontaneity and magic; it has only enhanced it greatly. In fact, I have found that drawing without a firm foundation in the principles of anatomy is more difficult than the actual learning of those principles.

When I began to write this book, my intention was to keep the spirit of figure drawing intact. I have not attempted to say everything that can be said about drawing, nor have I tried to list all the muscles of the human body. Rather, in a most pleasurable way, I wanted to sit down with you, look at these magnificent works and begin discussing those aspects of Michelangelo's work that are clearest to observe as well as most important to first-rate figure drawing.

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Rather, in a most pleasurable way, I wanted to sit down with you, look at these magnificent works and begin discussing those aspects of each work that are clearest to observe as well as most important to first-rate figure drawing.

The drawings selected for this book show the figure in many various poses from all different points of view. There is a great opportunity here to observe how a master draftsman foreshortens many of the forms of the body and changes their shapes in the different positions.

Anyone who seriously wants to understand great figure drawing must devote a considerable amount of time to the study of anatomy. I have only concentrated on the most important muscles and muscle groups on the surface of the figure. For greater clarity, I have included next to Michelangelo's works a diagram of the skeleton showing only the muscle or muscles under discussion. These are intended to help you understand and remember exactly where a form begins and ends.

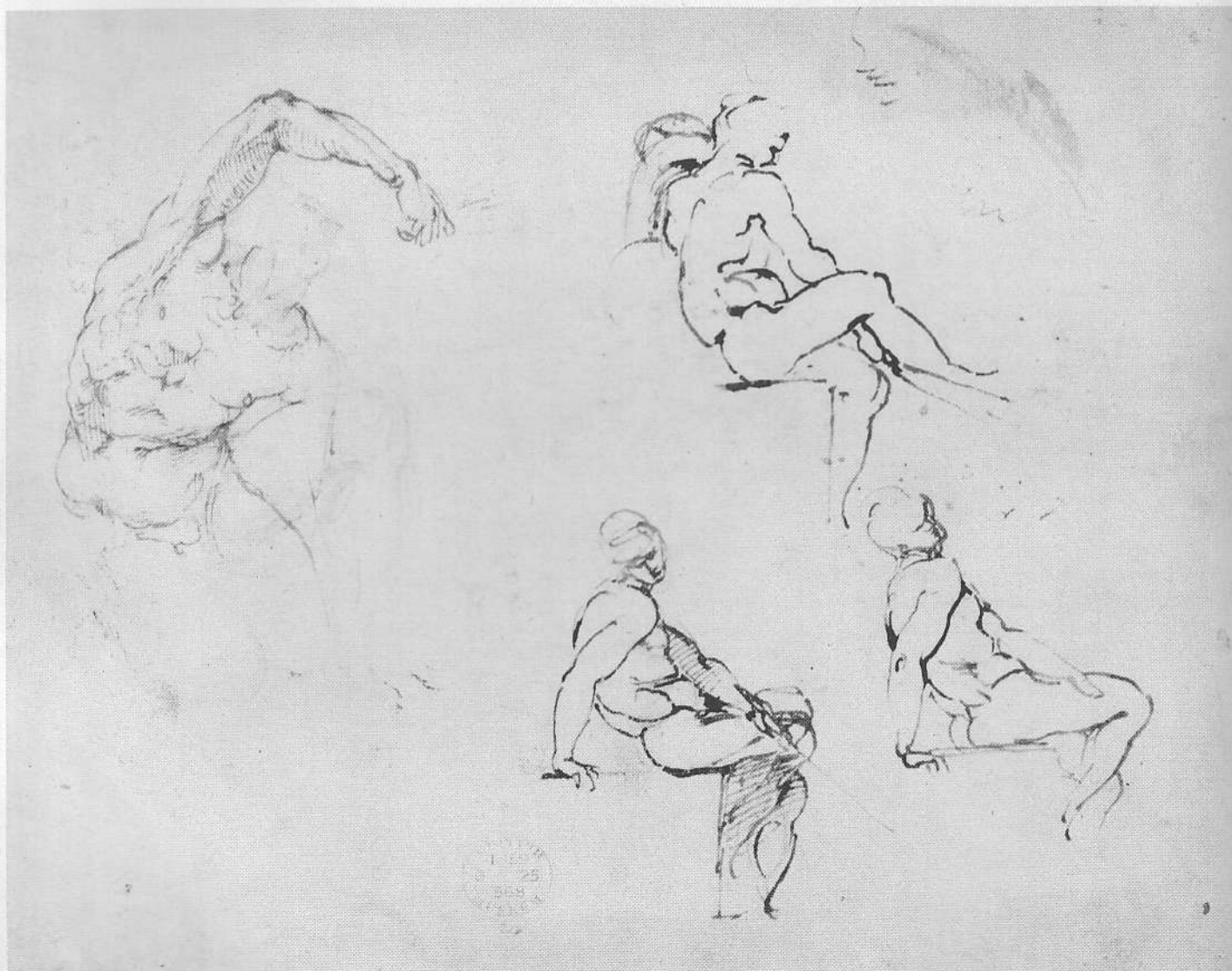
These writings are to be considered an introduction or catalyst to a profound study that you will spend the rest of your days enjoying. I felt strongly that I wanted to create a book that would knock down some barriers and allow young artists to begin to really understand the forms of the figure. It is clear to me that if I wanted the reader to share my great enthusiasm for anatomy and drawing principles, I would have to express some complex ideas in a more simplified way and I take responsibility for that.

More than anything else, this book is the expression of a love affair that I have had with the extraordinary drawings of the greatest master of the figure, Michelangelo.

Michael Burban
New York City, 1986

CHAPTER ONE

THE UNDERLYING STRUCTURE OF FORM



SKETCHES FOR THE NUDES
1508, lead point and pen
7 $\frac{3}{8}$ " \times 9 $\frac{5}{8}$ " (21.27 \times 24.45 cm)

Preliminary Sketches

Form is everything. For Michelangelo, drawing is a procedure for determining form. The illusion of form is merely approximate if form is indicated by light and shade alone. The shape of a form is defined exactly by the use of line. The three seated figures were drawn with light, sketchy lines called *pentimenti*, "repentances," or changes of mind before the final contour is drawn.

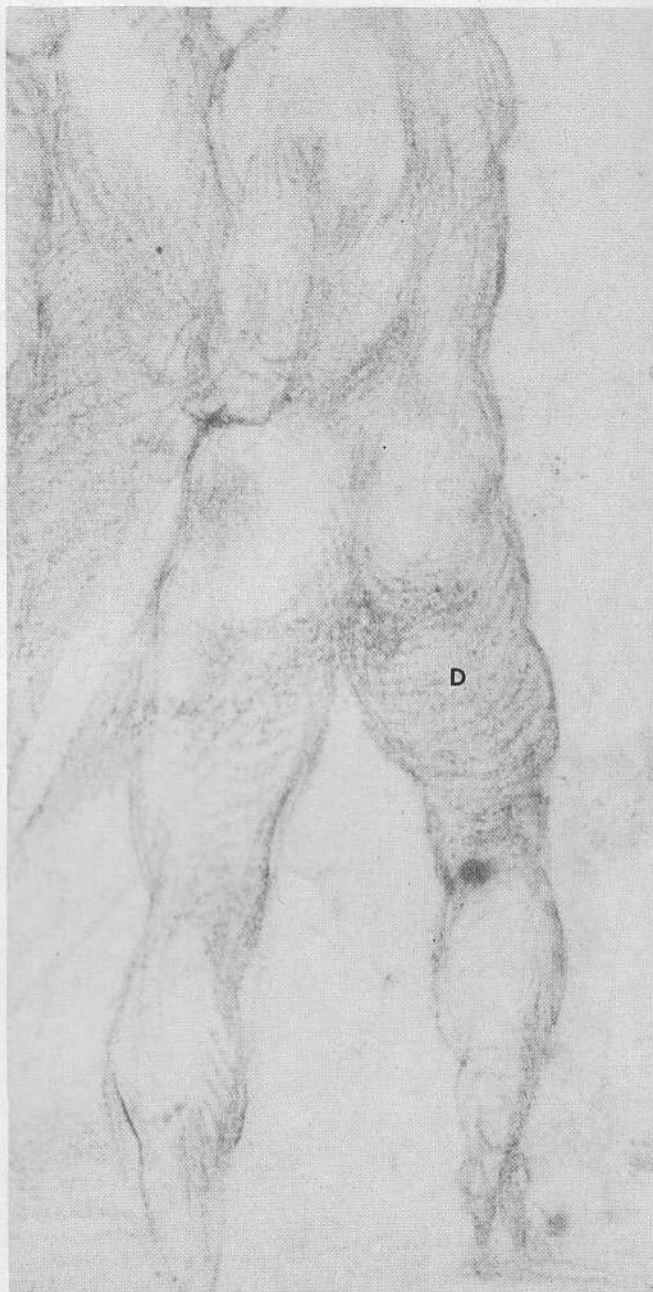
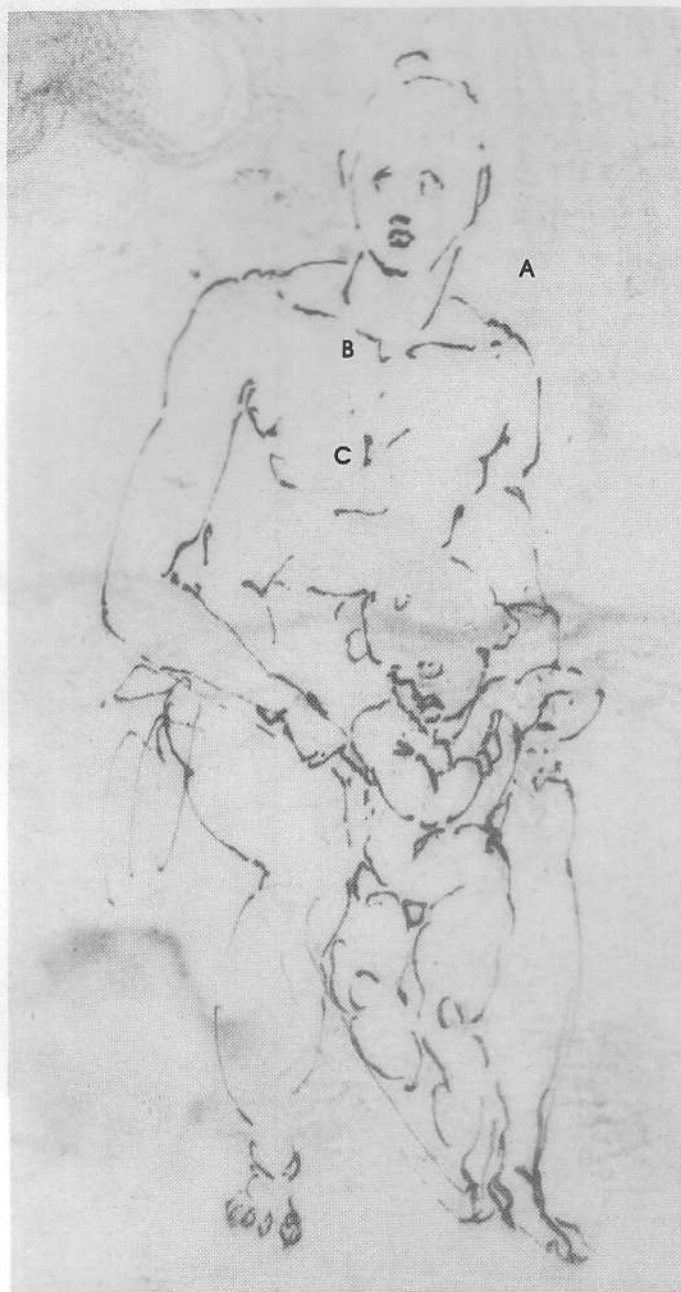
Preliminary sketches or contour drawings that indicate overall proportions and the gesture of the pose are essential to successful figure drawings. There is not much point in moving on to such details as hands or feet or

to the inside modeling of the figure without first establishing the outside shape of the figure in a general way.

Every figure has an implicit action, or gesture. The line A connects the parts of the body from head to toe and suggests the gesture of the pose. Gesture is the rhythm or music of the figure, which creates a pleasing relationship between one form and another. Michelangelo incorporated a strong sense of gesture in all of his drawings. His bold curving and spiraling lines prevented the pose from becoming stiff and unnatural.



Indicating Form with Line



Michelangelo drew constantly, and because paper was expensive in the sixteenth century, his pages were invariably filled with overlapping sketches and studies. The sketches on this page clearly demonstrate his early establishment of powerful, evocative drawings. The bold, unfaltering lines used to indicate the outside shape of the adult figure and child (A) are beautifully drawn. Once the outside contour of a figure was determined,

Michelangelo began to indicate more detailed forms. He represented skeletal and muscular masses by quick, light lines. For example, the lines at B indicate the collarbones, or clavicles; the short lines in the area of C suggest the great pectoral muscles on top of the rib cage. A series of short lines, which were then applied to the large masses, suggest forms that are to be in shadow; note the curved lines on the back of the thigh at D.

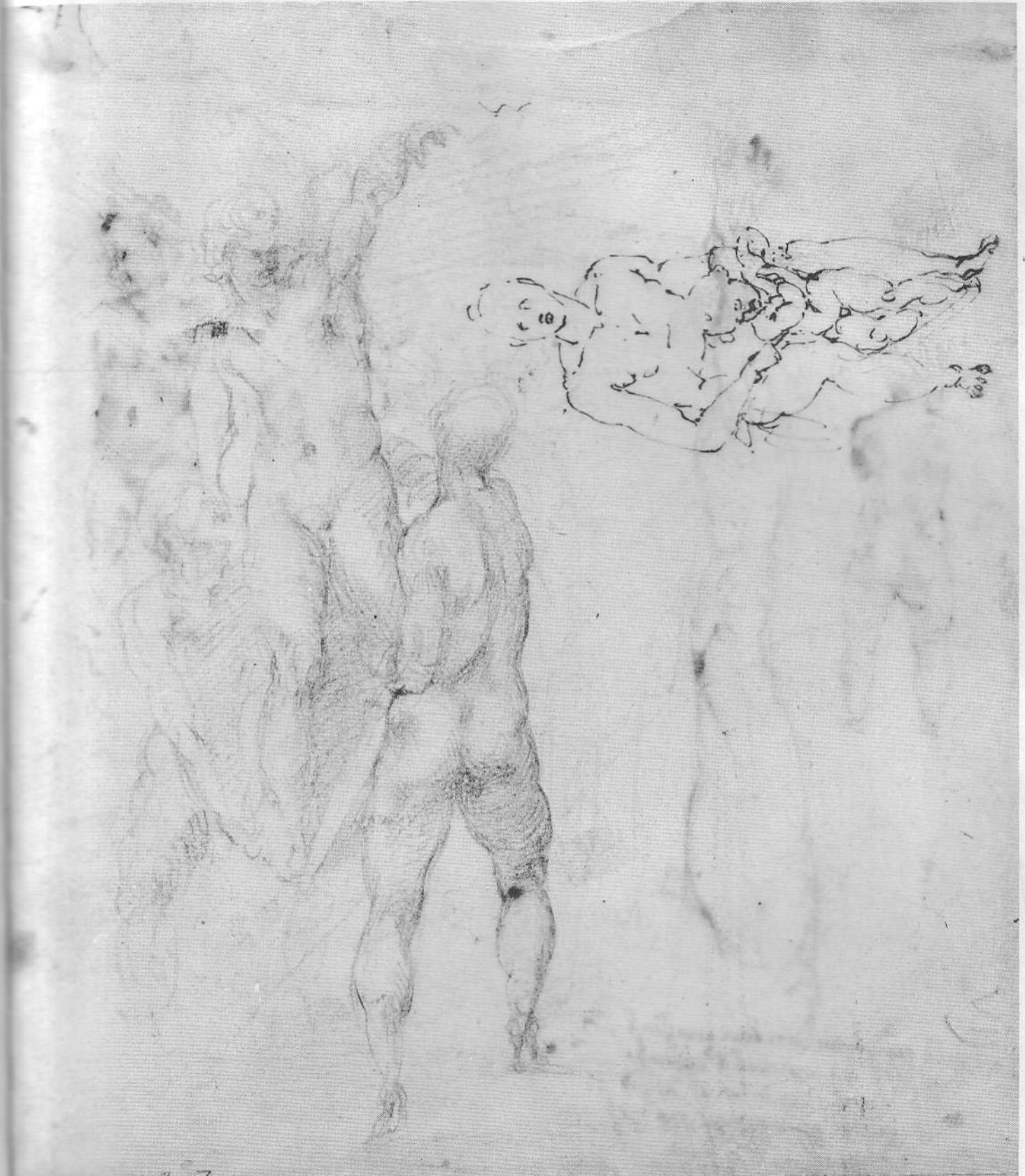


FIGURE SKETCHES FOR THE BATTLE OF CASCINA AND THE BRUGES MADONNA
1504, black chalk and pen 12½" × 11" (31.75 × 27.94 cm)

The Shapes of Form



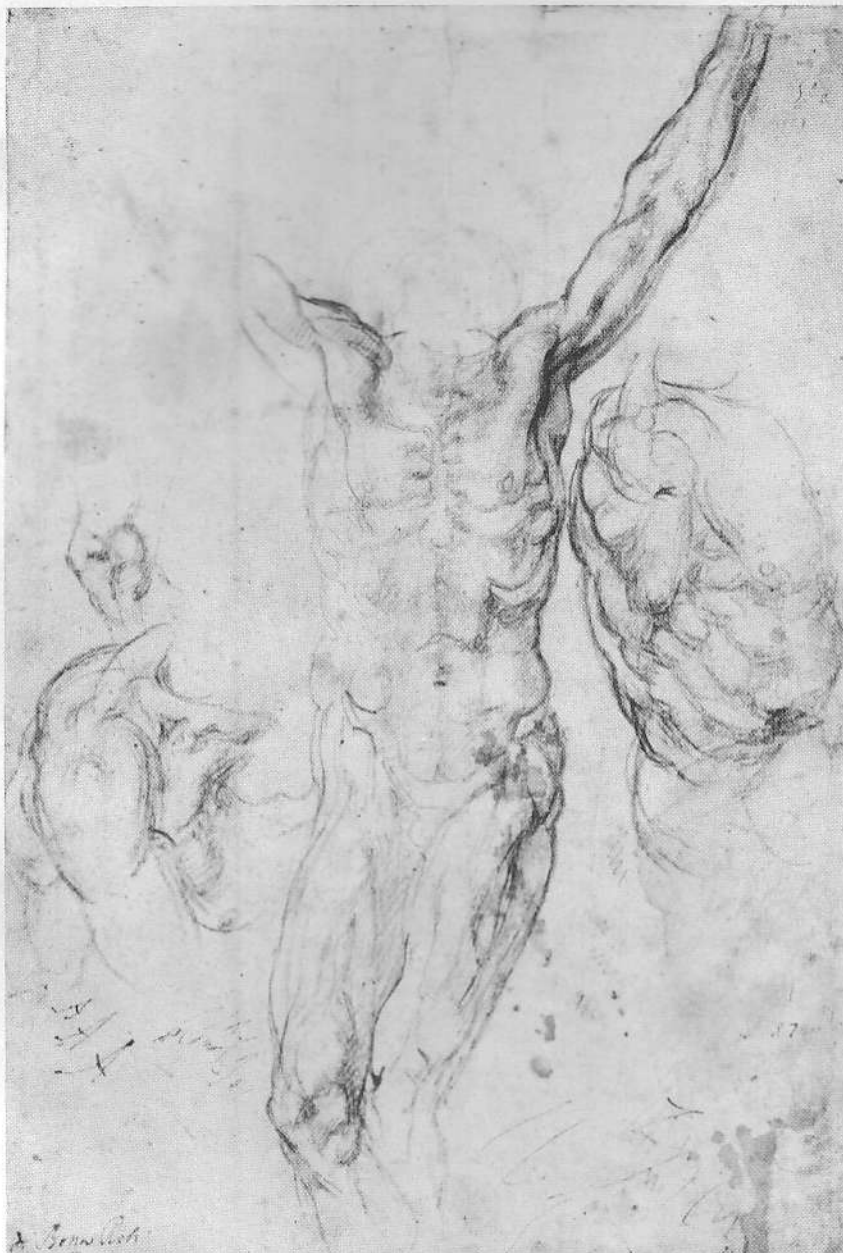
The two figures on the right of this drawing, which are rendered in light and shade (A), were perhaps first sketched in line, much like the two figures on the left (B).

It is helpful first to indicate the outside shape of the figure in a loose and general manner, without being concerned about minor details. Keeping in mind how the head, rib cage, and pelvic masses are to be placed in space, you must also determine the positions of the arms and legs. Once you have appropriately drawn the outside shape to define the direction and size of the forms, then carefully and patiently refine all the general lines to achieve the final outside contour line. As you observe the outside shapes of these figures, notice the various changes in direction of the lines. Ultimately, the lines of the figure cannot be vague; they must clearly represent the anatomy. It is important, however, not to draw lines indicating details until the directions and proportions of the larger forms are exactly the way you want them. Obviously the study of the shapes of the forms of the body is fundamental to drawing those forms accurately. As the true shapes of the bone and muscle structure are understood, lines become very easy to draw.

TWO SOLDIERS SEEN FROM
BACK IN VARIOUS POSES
1534, black chalk
5⁹/₁₆" × 4¹/₈" (15 × 10.6 cm)



The Skeletal Framework

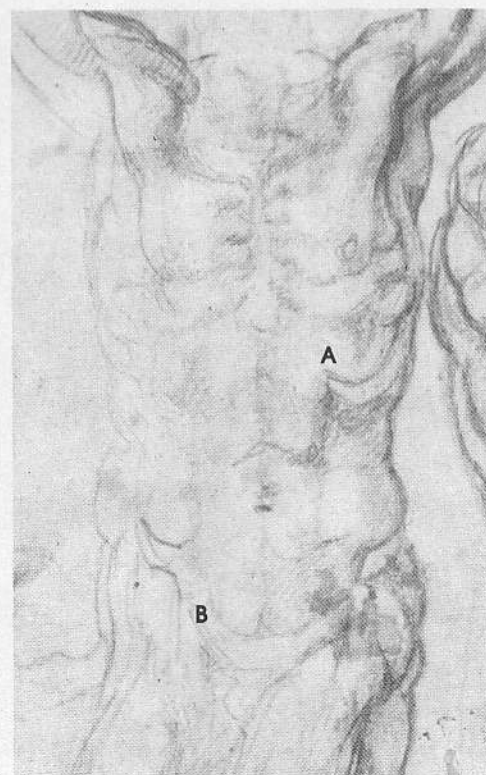


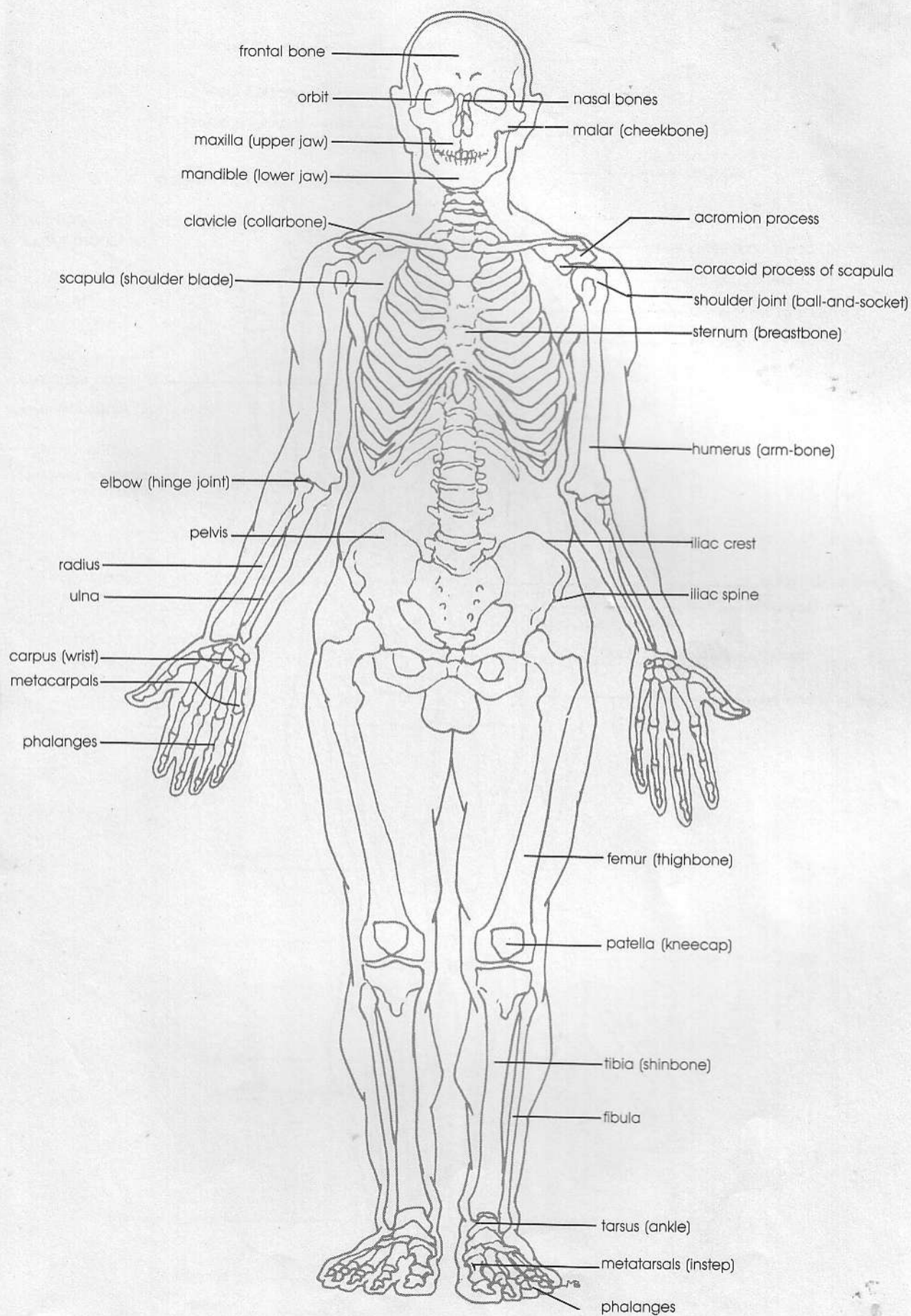
STUDIES FOR THE THREE CROSSES
1520-21, black and red chalk
13" x 9" (33.02 x 22.86 cm)

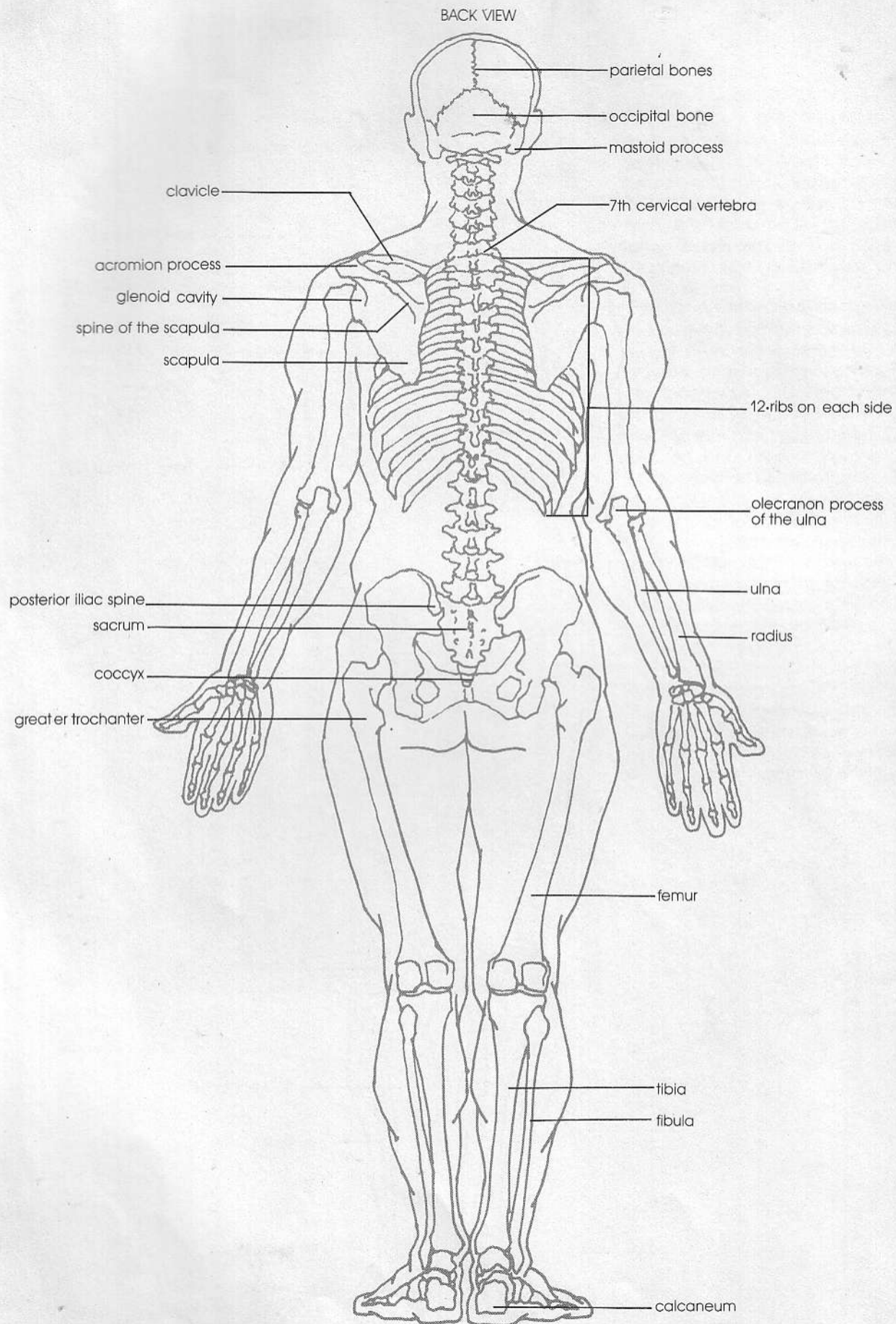
In the drawing at left, you can see how Michelangelo built fleshy forms on top of the skeletal structure. The rib cage (A) and the pelvis (B) are huge bony structures on which to base the entire pose and gesture. Landmarks of the flesh vary greatly from one individual to another. On some models the nipples are low; on others they are high. Bones give a reliable set of fixed points, or landmarks, on which to build a drawing.

Make anatomical drawings along with your drawings from the model. Of course your model does not look like an anatomical drawing, but by making accompanying skeletal and muscular drawings, you are lifting the curtain of skin in order to see the underlying structure that determines the shapes on the surface.

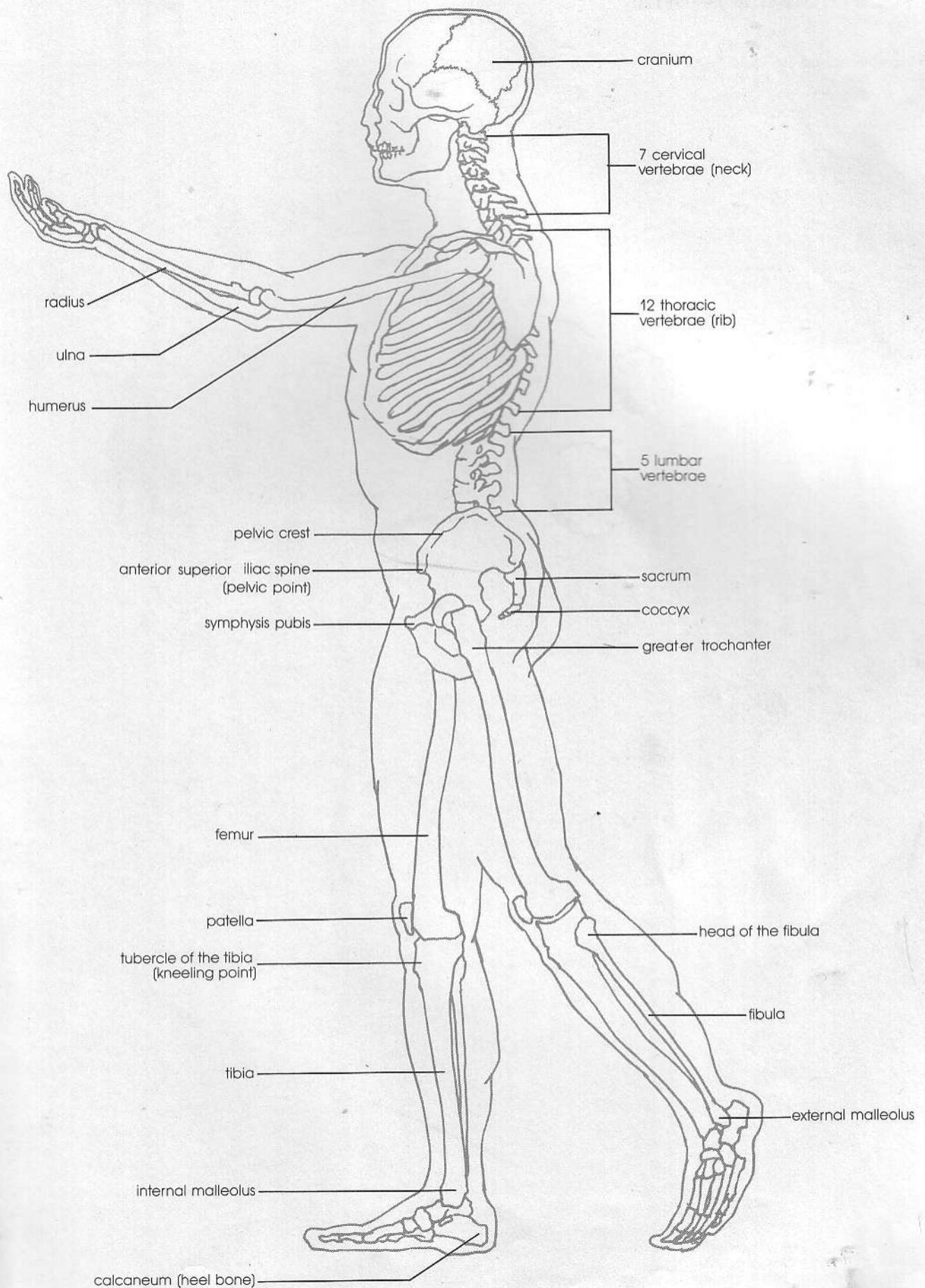
A good way to learn the forms of the body is to practice drawing the major masses from anatomy charts. Draw the front, side, and back views. Close the book and see how much you can draw from memory. It is also a good idea to practice drawing from the great masters. If Michelangelo can give you an idea where the lines should be put down, what better help could you have? Another way to learn is to draw from a real skeleton. Sketch the skeleton over your figure drawings to see if you have placed the bones correctly. Many bones are directly under the skin—for instance, the skull, the knee, and the bones of the feet and hands.



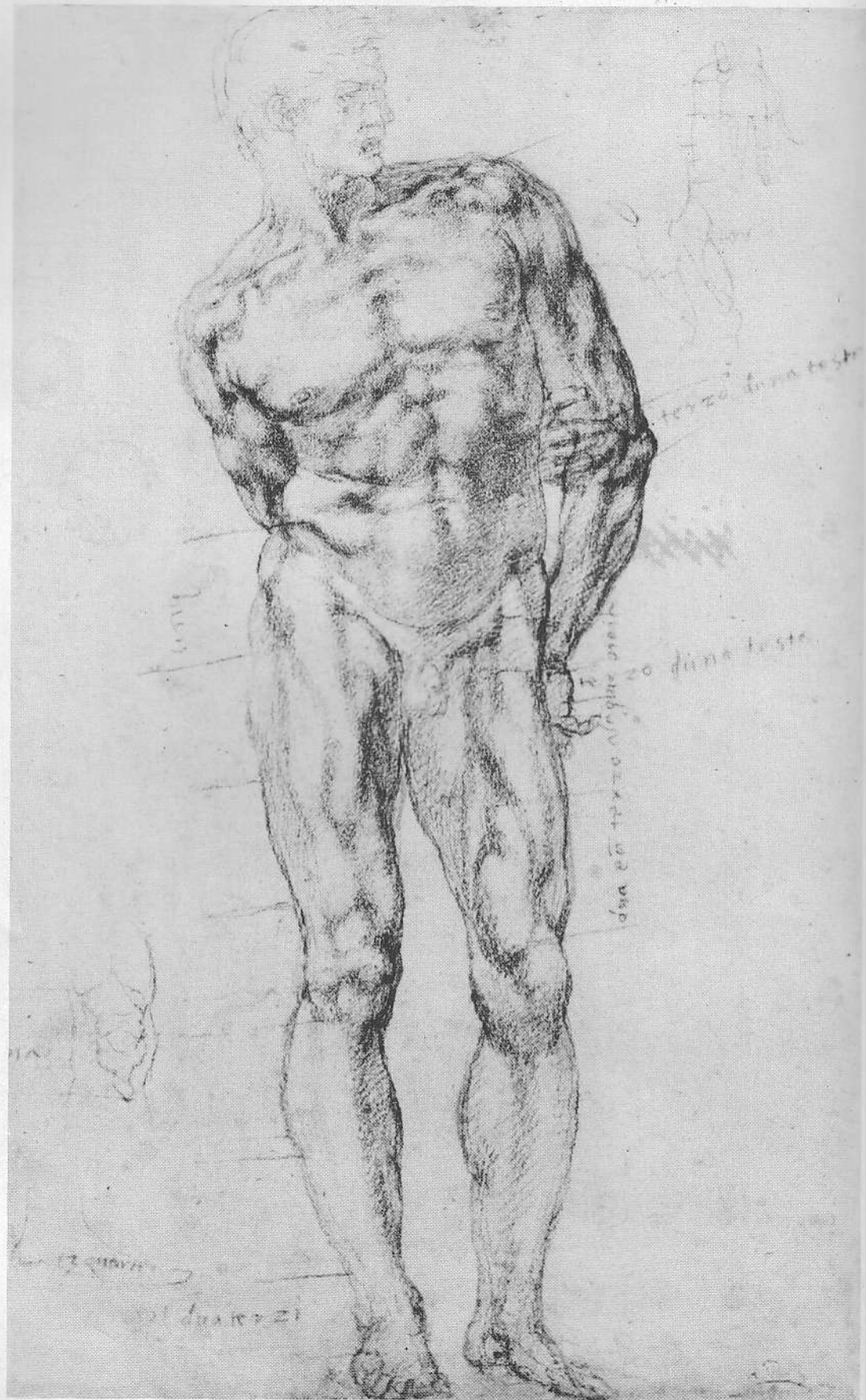
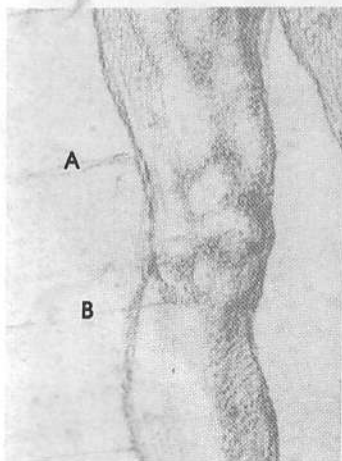




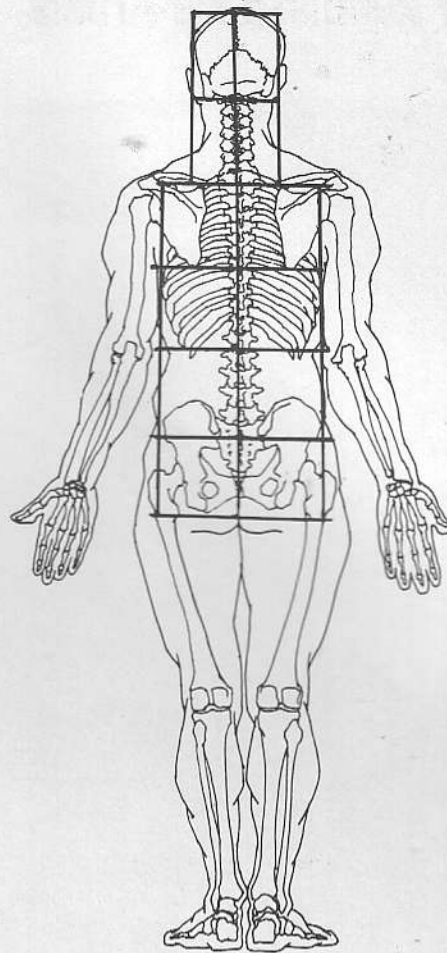
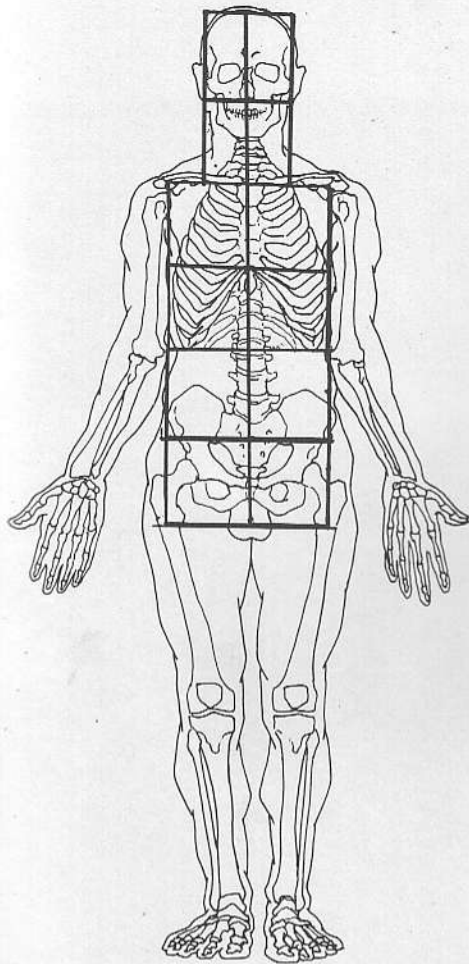
SIDE VIEW



Proportional Systems



MALE NUDE WITH
NOTES OF PROPORTION
1525-28, 11" x 7" (28.9 x 18 cm)



These boxes are based on the length of the sternum. Note the relationship of this length to other areas of the body.

In drawing, the figure is built out of masses that have a relationship to each other. This is called proportions. In a proportional system the artist can use whatever part of the body he likes as a unit of measure. Then he need only analyze how this chosen unit relates to other parts of the body. The ancient Egyptians had a proportional system that was based on the length of the middle finger; applications of this system also occur in certain examples of Greek art. According to this system, the length of the middle finger multiplied by nineteen equals the height of the figure. The length of the hand multiplied by ten or the length of the foot multiplied by six also approximates the height of an average human figure.

As he developed the drawing shown here, Michelangelo was evidently thinking of the length of the knee and how it relates to the other forms of the body. After correctly rendering the parts of the knee in line, Michelangelo proceeded to add light and shade—note that the light in this drawing comes from the left and toward the front of the figure.

It is interesting to observe that the length of the knee, that is, the distance from the top of the common tendon, (A), of the quadriceps muscle to the kneeling point, or tubercle of the tibia (B), equals the length of the breast-

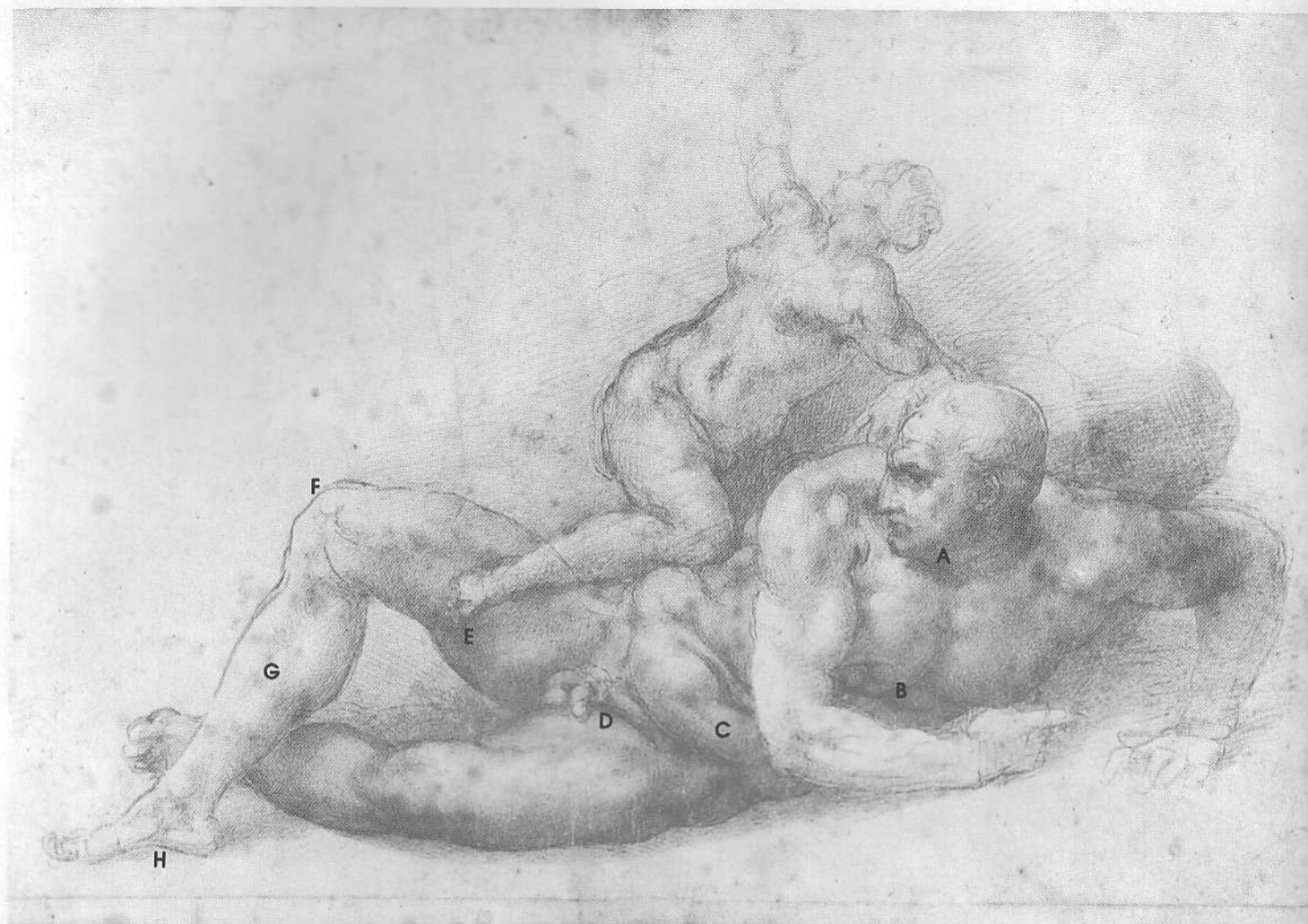
bone, or sternum, minus the xiphoid process, which is located at the bottom of the sternum.

The length of the sternum in fact equals the length of several other sections of the anatomy. For example, it equals the length of the clavicle, the length of the shoulder blade, or scapula, the distance between the scapulae, the length of the hand minus the tip of the third finger, and the width of the head.

In addition, the sternal length multiplied one and a half times equals the length of the head (from the top of the skull to the bottom of the chin) and the length of the forearm. The sternal length doubled equals the length of the rib cage, the approximate width of the rib cage at its widest point, and the length of the upper arm, or humerus. Three times the length of the sternum equals the length of the thigh as well as the length of the leg with the foot, that is, the height of the foot (the distance from the ankle to the ground).

Have you ever completed a drawing of the figure only to find that the head is too small, the arm is too long, or the body is too wide? The cure for these problems is to work as much as you can with proportions. The ancient artists of Greece loved to work with measurements and numbers and those harmonious numbers found their way into the relationships of the forms of the figure.

Proportions Used by Renaissance Artists



By understanding the relationships between forms in a standing figure, you will have a better idea of what to expect when you encounter figures in seated or reclining positions.

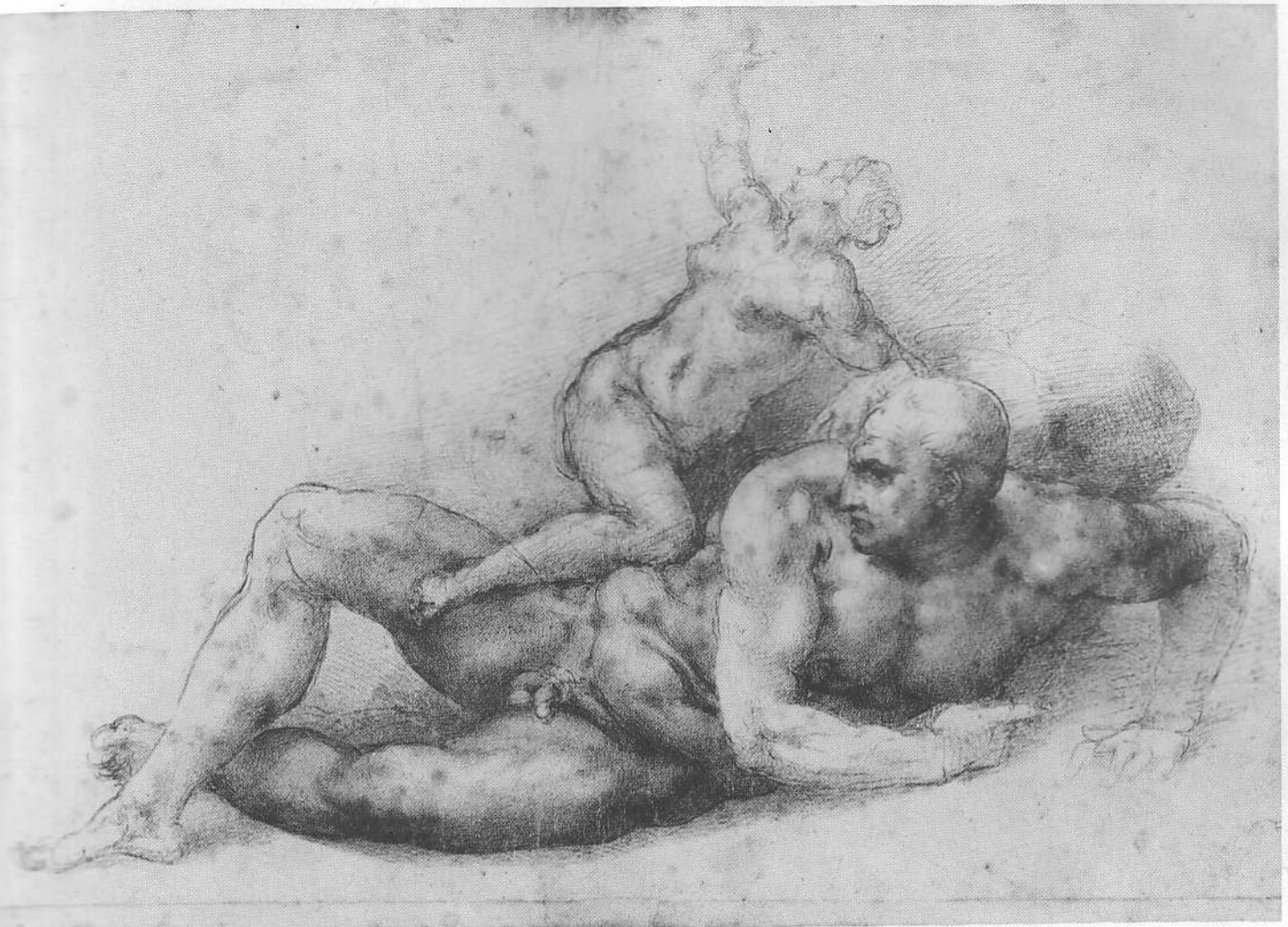
Artists of the Renaissance were fond of using the length of the head as a unit of measure. The length of the head multiplied seven and one half times equals the total height of an average figure; the head length multiplied by eight equals the height of a tall person; and the head length multiplied roughly by seven equals the height of a short individual. Renaissance artists usually used eight heads as a measurement simply because it is easier to subdivide eight than seven and a half. Of course not all models are the same height. Discrepancy in height, in most instances, occurs in the lower limbs; the length of the head and trunk does not vary so much. Therefore, adjustments in height were

usually made in the lower limbs.

According to this system of measurement, the head itself constitutes the first measurement (A). The second measurement is the distance between the chin and the nipples (B). The third measurement is the distance from the nipples to the level of the navel (C); the fourth from the navel to the crotch, or symphysis pubis (D); the fifth from the crotch to the level of the middle of the thigh (E); the sixth from the middle of the thigh to the level of the knee (F); the seventh from the knee to the middle of the lower leg (G); and the eighth from the middle of the lower leg to the bottom of the foot (H).

If you apply the length of the head to the widths of some of the masses of the figure, you can see that the length of one head equals the distance between the nipples as well as the distance across the waist.

One and one half head lengths equal the



distance between the armpits as well as the width of the male's pelvic mass; the female's pelvic mass is slightly wider.

The length of two heads equals the distance across the male's shoulders; the female's shoulders are slightly narrower. The length of two heads is also equal to the length of the thigh.

It is a mistake to begin drawing from the top of the head and attempt to finish your drawing at the bottom of the figure all in one execution. Instead, sketch in the parts of the figure in a general way, indicating proportions and gesture. Think of your figure drawing as a map on which you simply want to plan and discover the placement of the parts of the body. The establishment of points, or landmarks, and the placement of lines connecting these points are important in plotting proper proportions between forms of the body.

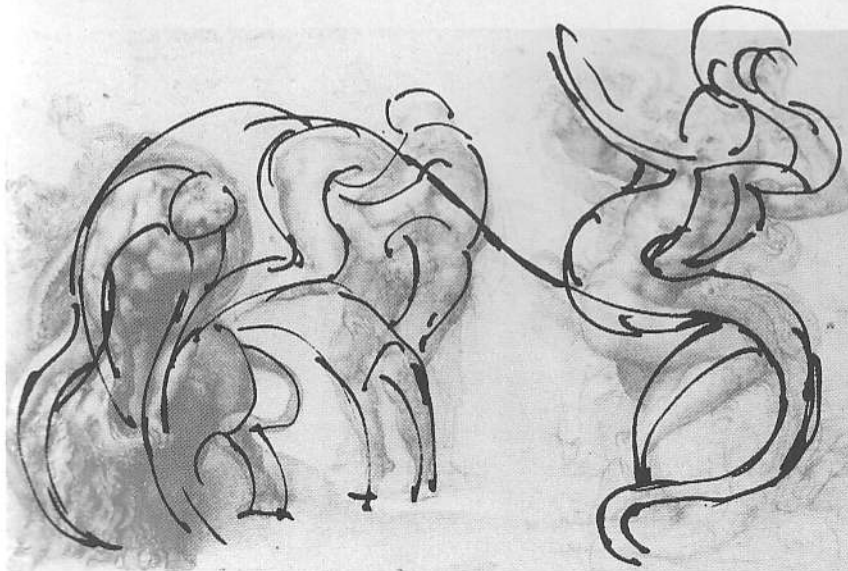
As you draw, continually scan your subject. The introduction of bad proportions results when you look too long at any given part or detail of the body. In addition to the proportional systems that have been discussed here, why not explore and come up with other relationships of your own? The more relationships that you can find as you draw, the more accurate your figure will be. Proportional systems should be useful and comfortable. Michelangelo's measurements of the figure are clearly different from those of, say, El Greco. The female figure of Delilah and the larger figure of Samson that you have been studying here are drawn according to proportional systems that are roughly the same. It is the lengths of the units of measure that are different; notice that the head of Samson is twice as large as that of Delilah.

SAMSON AND DELILIAH
1530. red chalk
10 1/8" x 15 1/2" (27.2 x 39.5 cm)

Designing Forms

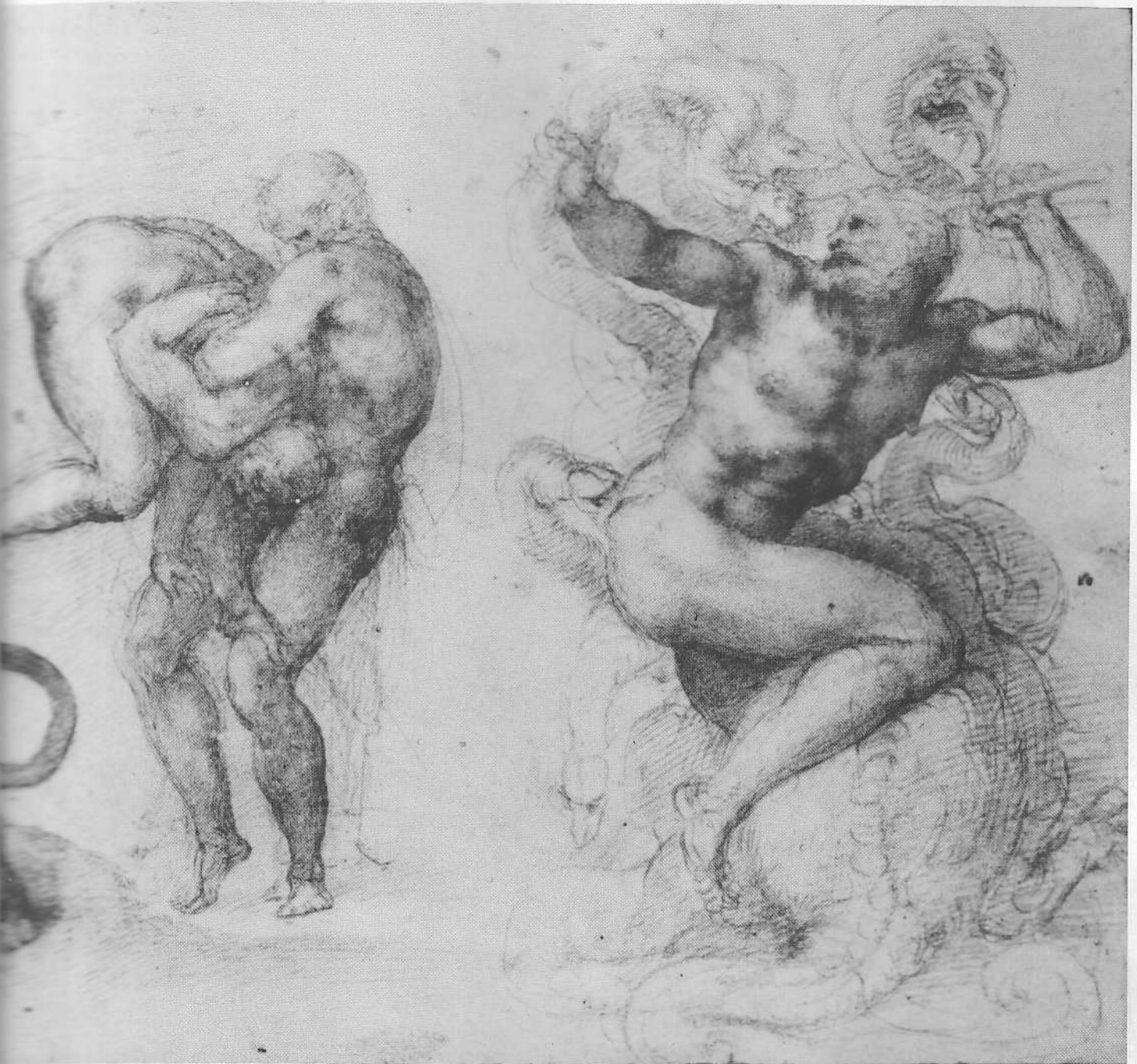
The effective placement of one object in relation to another object is very important in a work of art. The things that you learn about drawing a single figure will also be of help in composing a picture made up of groupings of figures. Just as there is a gesture, or rhythm, throughout the forms that make up a single figure, there must be a rhythm that connects multiple images.

In this drawing of Hercules engaged in disparate actions, the gestures of the individual figures blend harmoniously to create a unified composition. Their harmony of gesture causes the eye to flow freely from one figure to another. Try to visualize curved, flowing lines that connect the three figures in this drawing. A good composition often has numerous rhythm lines running in many different directions. Thus, the parts of a drawing are never treated as bits and pieces but work together to form a larger unity.



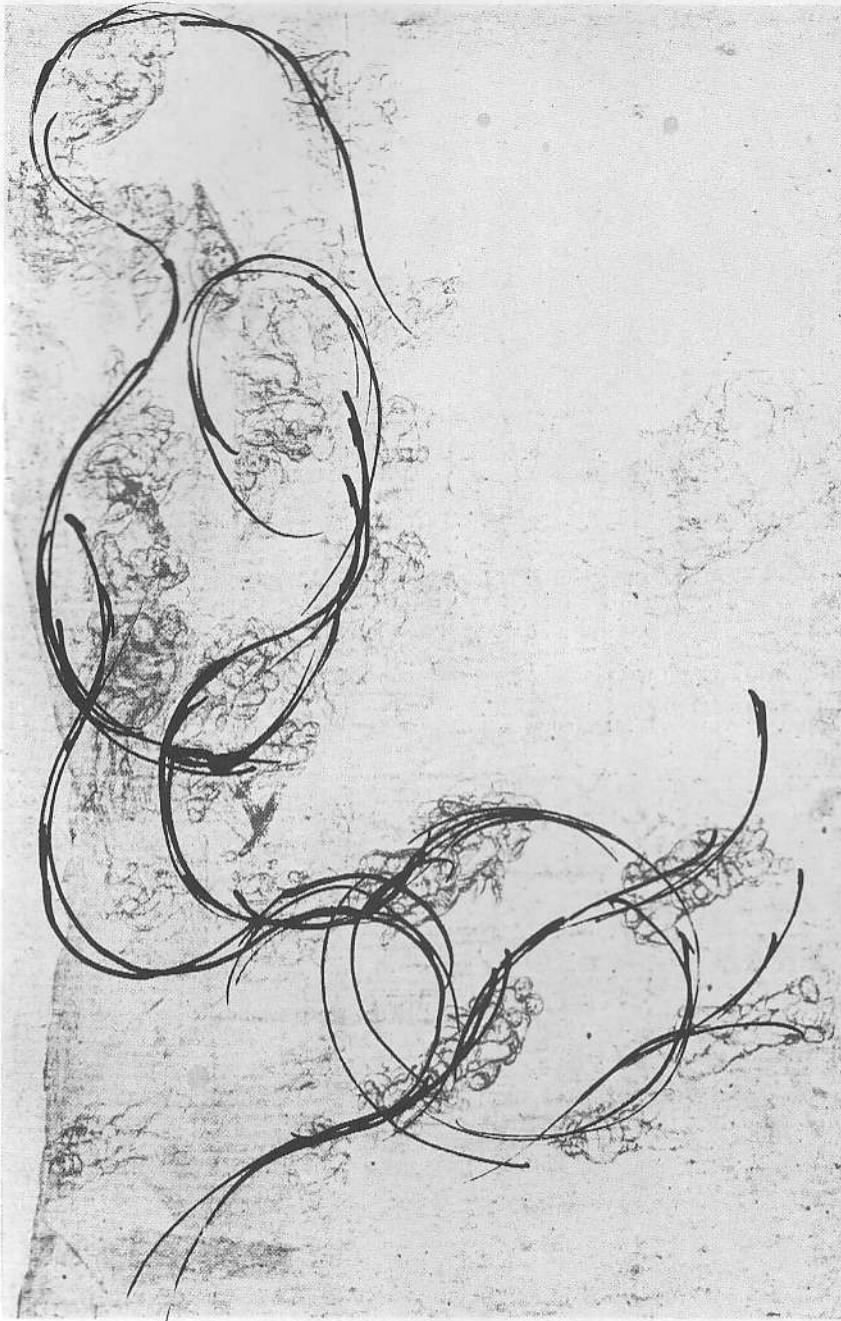
Rhythm lines indicate the flow of movement within a drawing and relate individual figures to the composition as a whole.





THREE LABORS OF HERCULES
1528, red chalk 10 $\frac{3}{4}$ " \times 16 $\frac{5}{8}$ "
(27.31 \times 42.23 cm)
Damaged

Simplifying Complex Form

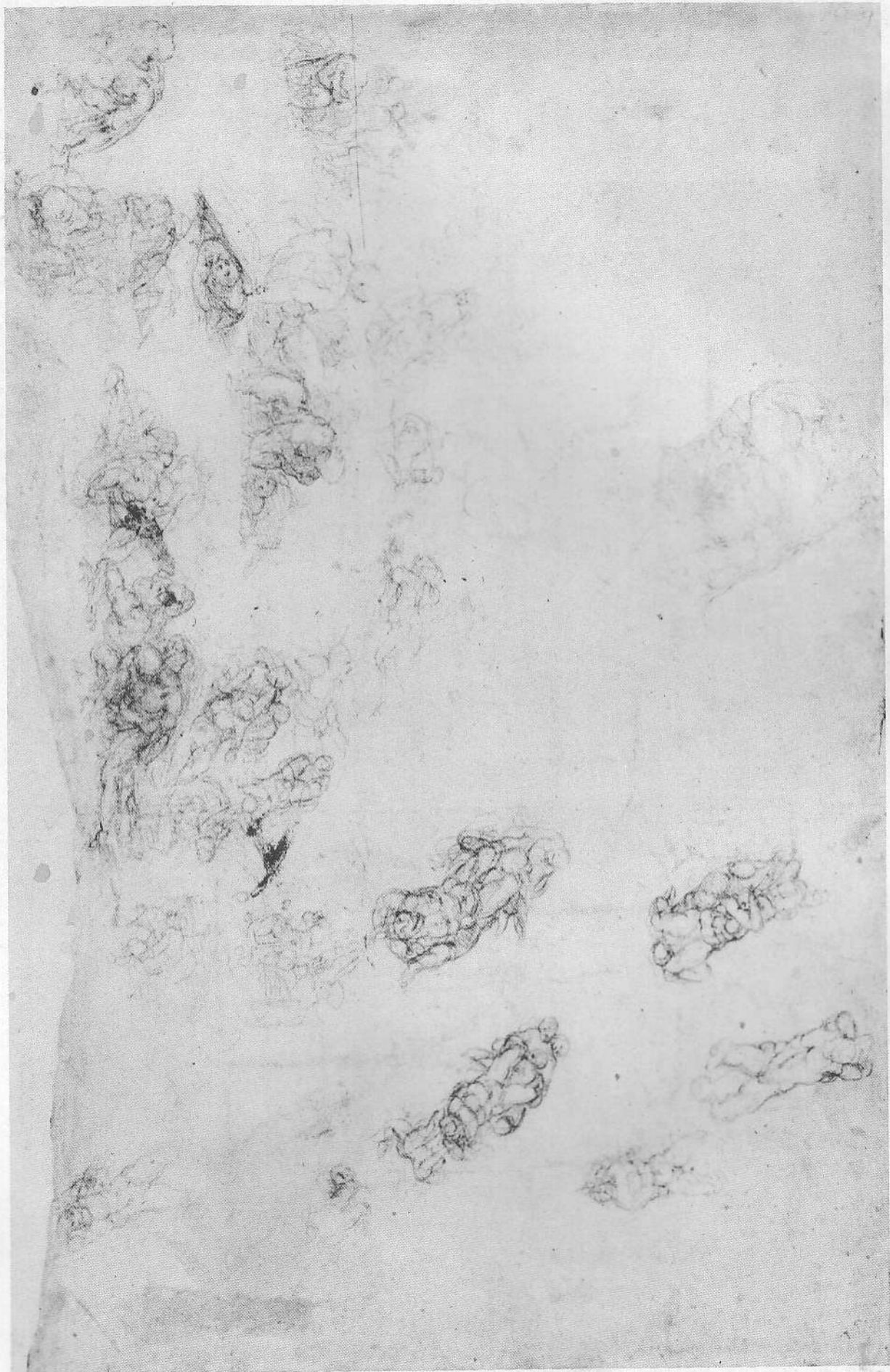


These swirling lines demonstrate the way various figures relate to each other within the context of a single drawing.

This is a fascinating sketch involving many figures and much dynamic action. It is valuable because it shows how Michelangelo thought about and drew complicated clusters of interacting figures. These figures are drawn as simple forms, but the drawing is in no way vague. The separation of one muscle mass from another on these small bodies is clearly defined by line; and short, hatched lines are placed on those figures or parts of figures to represent shading. Note that the light source in Michelangelo's drawings almost always comes from the left.

Whether you are working on a drawing of one figure or a hundred figures, it is wise to keep all the forms simple. If you can visualize one hundred figures as one large mass, you will have discovered a fundamental truth about what great drawing entails—the subordination of detail to the effective rendering of the whole.

SKETCHES FOR THE DEAD: RISING
1534, black chalk 11" × 16½"
(27.94 × 41.91 cm) Damaged



CHAPTER TWO

THE HEAD AND NECK



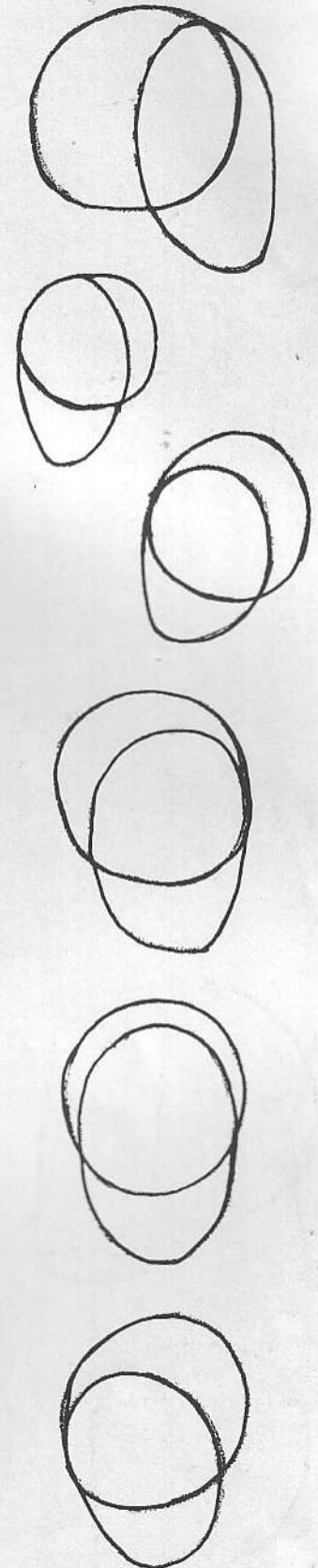
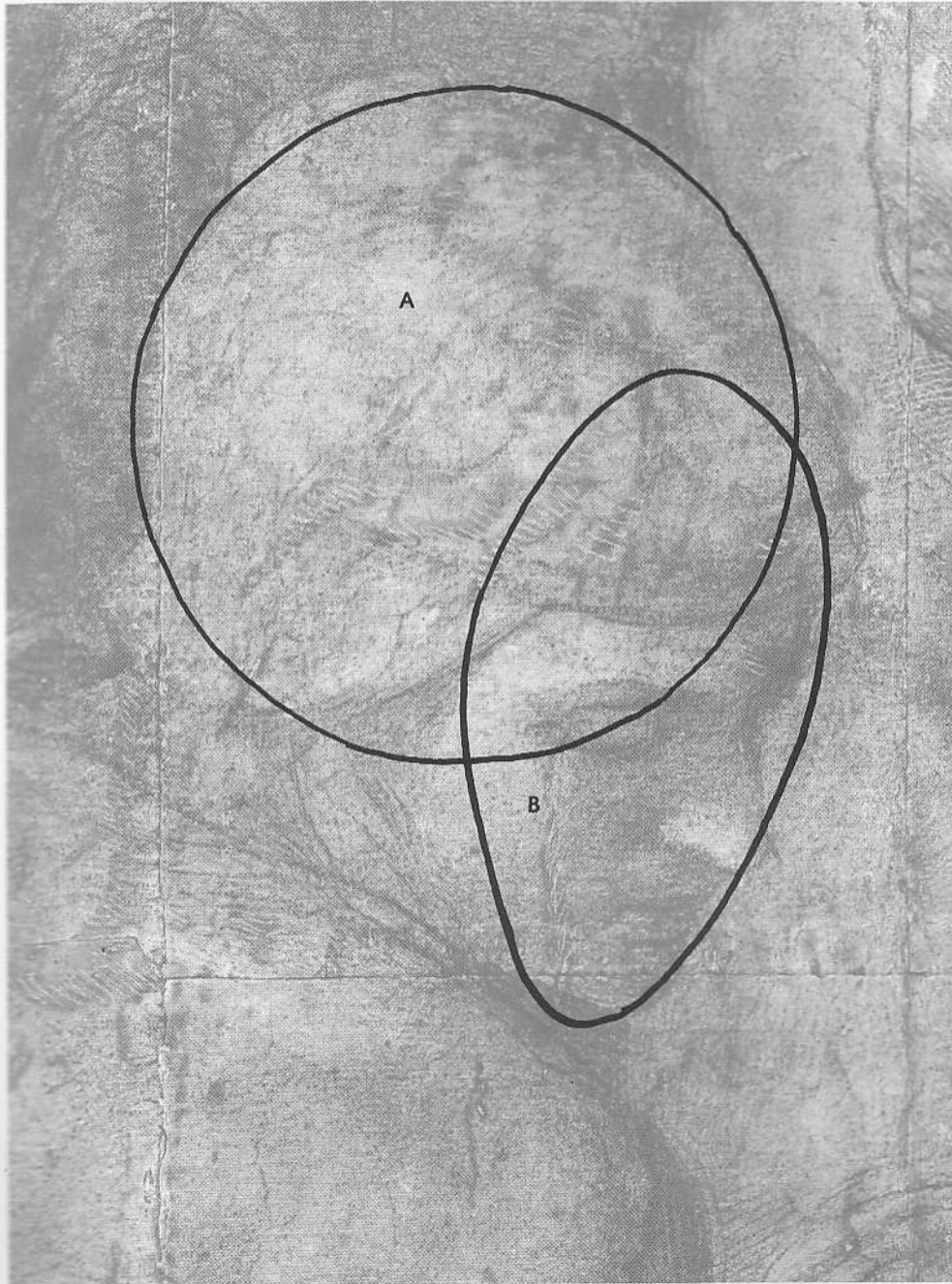
THE CRUCIFIXION OF ST. PETER, detail 1545, black chalk 8'7½" × 5'1¾" (262.89 × 155.89 cm)

Massing the Head

This is a detail of the drawing that appears on page 131. The oldest massing concept used by artists for the head is that of the ball and the oval. Try to see through details of the head as if they did not exist and note that the braincase, or cranium, is a sphere (A), and the mass of the face, when the features are disregarded, appears to be an oval (B). It is extremely important to understand the size of the ball of the head in relationship to the size

of the oval of the face. The ball of the head, or cranium, will fit into a perfect square; the oval of the face is one and a half times as long as the ball of the head. People often make the cranium too small for the face.

The artist must also consider how these two large masses are to be placed. The relationship of the ball of the head to the oval of the face will of course vary depending on the position of the head.

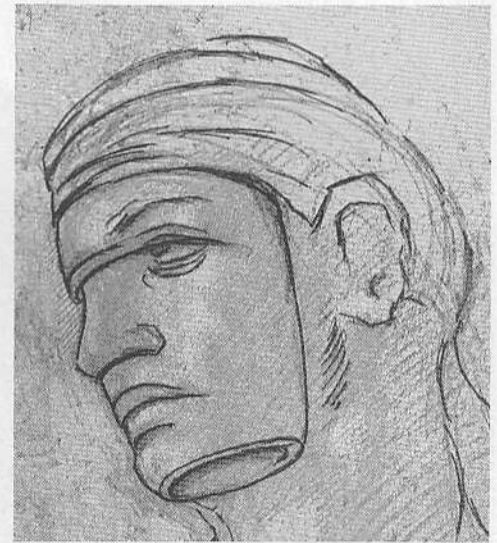


The relationship of the ball of the head to the oval of the face will change as the model's position changes.

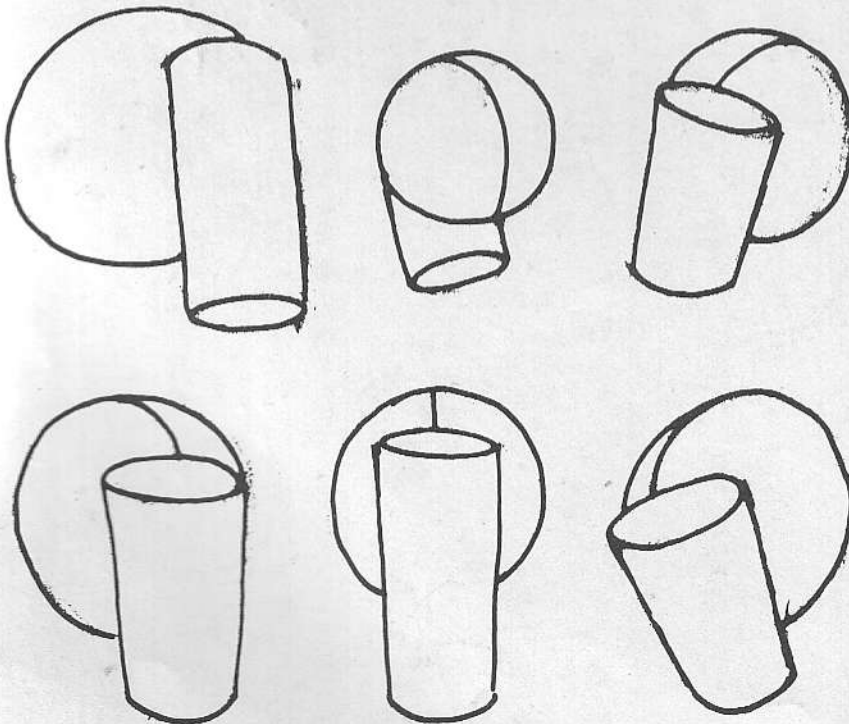
Positioning the Head in Space



The task of drawing such complicated forms as the head in a tilted position is greatly lessened if you first think of that head as a simple form—a block, cylinder, or oval—and then place this simple form in a position that corresponds to the desired position of the head. Disregarding the features, the drawing of this head can be understood as a cylinderlike mass tilting into the paper at the top as the bottom of the cylinder projects forward. If a cylinder were placed in this position in space you would see some of the circular under plane at the bottom or base but none of the circular top plane. Notice that the lines representing the hat (A) define and emphasize the cylindrical shape of the forehead, and that the lines used for the border of the lower jaw (B) suggest the under plane of the cylinder. Visualizing the face as a cylinder with lines encircling it also helps insure that you place eyes, nose, and mouth on the head correctly.



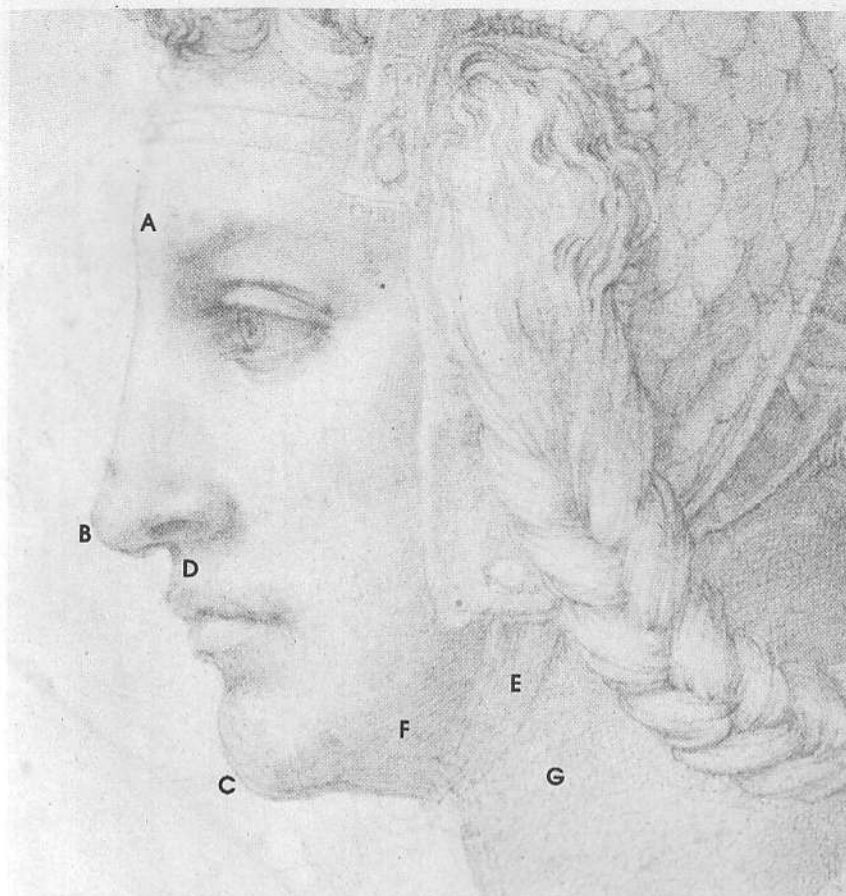
To insure the proper tilt of the head in a drawing, it is helpful to think of the face as a cylindrical form.



STUDY OF THE HEAD OF DAWN
1520-21 (or later)
red chalk, black chalk, and pen
13" x 8½" (33.02 x 21.59 cm)



Proportional Systems: Facial Features



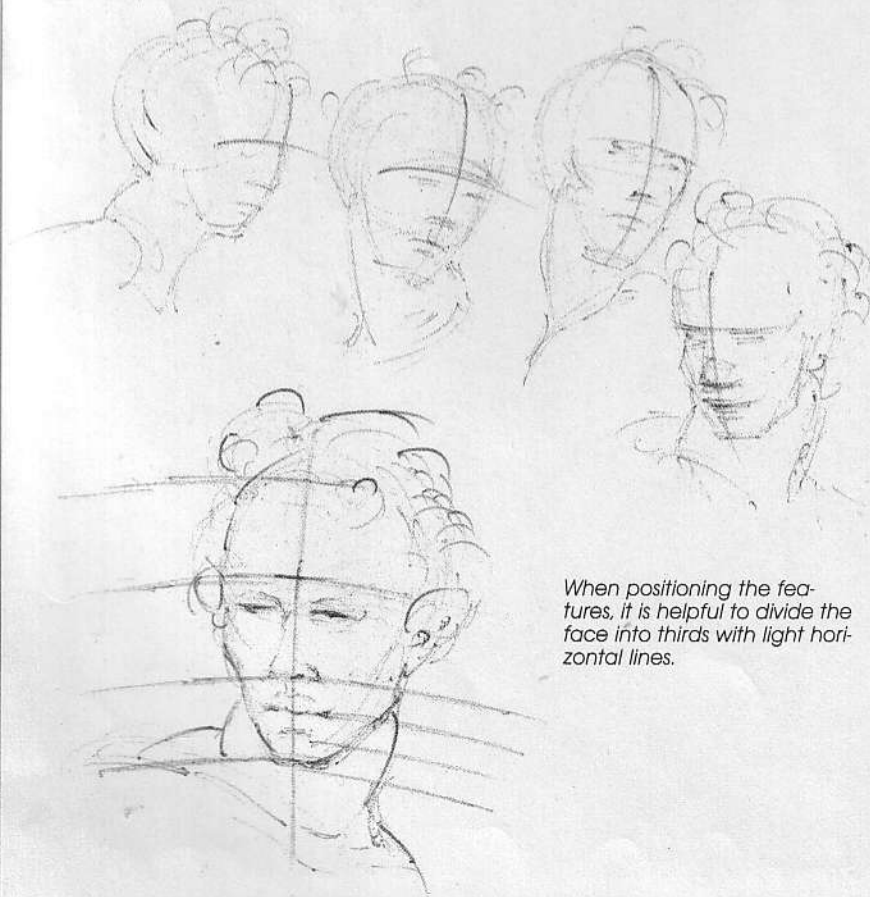
The first things you might notice in this drawing of a head are the beautiful and complex details, but the details are not what make this drawing great. What is important to notice is that the smaller forms are drawn so that they appear to rest gracefully on top of the larger mass of the head itself. Heads drawn by Michelangelo always give the illusion of being a solid mass in space.

When deciding on the placement of the features, it is helpful to divide the face into thirds. You might want to run light horizontal lines around the oval-like mass of the face at the level of the features. The forehead from the hairline to the brow (A) would represent one third; the nose would represent the second third; and the space from the bottom of the nose (B) to the bottom of the chin (C) would take up the last third. This last section can be further subdivided into thirds in order to place the mouth and chin correctly. The separation of the lips will be at the bottom of the first third; the top of the chin will be near the bottom of the second third; and the bottom of the chin will be at the bottom of the last third. You have to say "near" or "about" when speaking of measurements because there are no absolute rules; you can just notice how closely the features of the model correspond to the classical proportions outlined above.

In terms of depth, the relationship of the features must also be clearly established. The nose is farther forward than the mouth; the upper lip is more forward than the lower lip; and the chin is farther back than the mouth. Try drawing construction lines—horizontal, vertical, and diagonal—from one feature to another. The philtrum (D), or area above the center of the upper lip, extends downward from the center of the base of the nose. The philtrum forms a most interesting plane; it is concave from top to bottom and also concave from side to side. This is the only plane of its kind on the entire figure.

The more sensitive you are to relationships between various features, the better your drawings will be. Note that an imaginary vertical line extending upward from the back of the wing of the nose would connect this point of origin with the inner corner of the eye.

Notice too that the chin strap (E) in this drawing serves as a contour line that helps to explain the curved aspect of the under plane of the lower jaw (F). The chin strap also separates the lower jaw from another curved plane, the cylinder of the neck (G). You can see that the chin intersects the neck at a lower level than does the back of the skull. The base of the neck is lower in front than in back, which gives it a forward thrust.



When positioning the features, it is helpful to divide the face into thirds with light horizontal lines.



FEMALE HEAD IN PROFILE, 1532-34, black chalk 11¼" × 9¼" (28.58 × 23.50 cm)

Defining the Features with Light and Shade

It is not altogether clear whether this is the head of a man or a woman; Michelangelo frequently used male models for drawings of women. The artist's initial sketch lines are visible in this drawing. There are very few straight lines here. Michelangelo was concerned with creating a solid head on a flat piece of paper, which is best accomplished by using curved lines. The lines of the hat (A and B) help clarify the roundness of the head. The lines of the sternocleidomastoid muscle (C) help to define the neck as a cylinder.

This three-quarter position dramatically increases the illusion of the head as a three-dimensional form. Think of a cube drawn in just such a position. Now draw or think of a cube placed in a complete side view; note

how the symbol of a solid is weakened.

Of course with the head in this position, the side and portions of the front planes of all of the smaller forms of the head are also visible, as are the back and side planes of the neck.

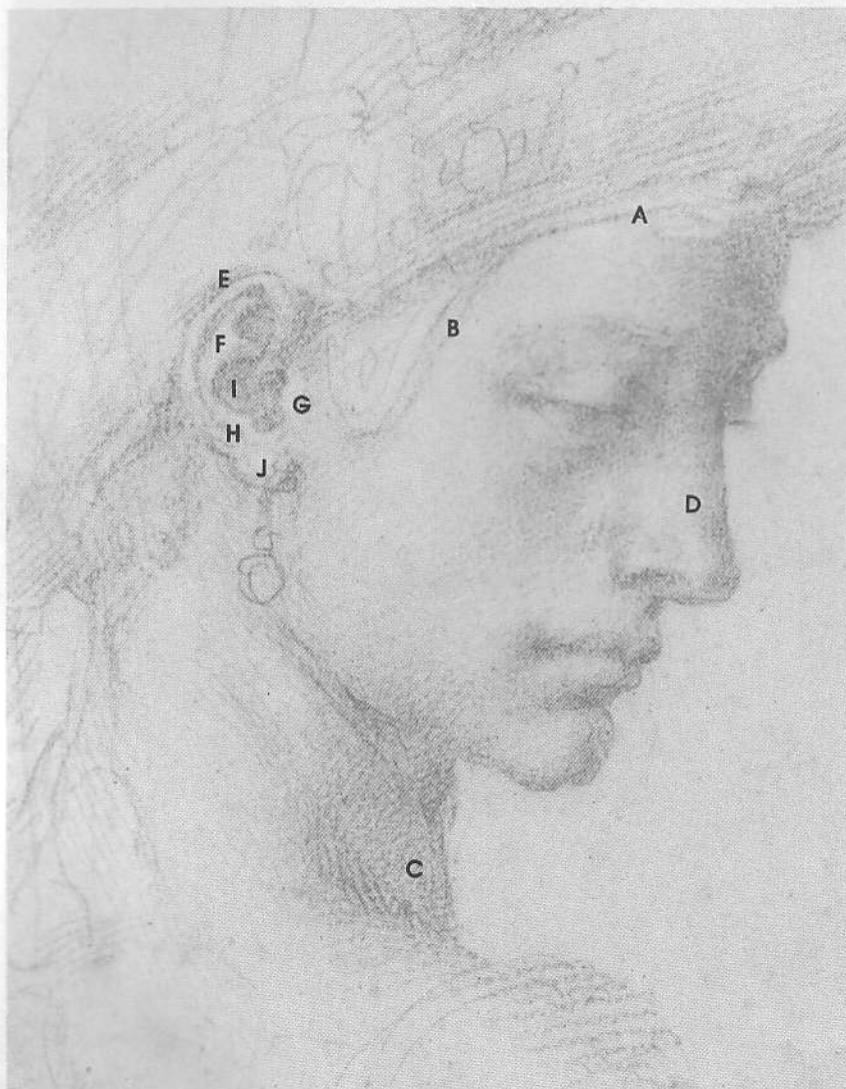
The direct light in this drawing comes from the left and the reflected light comes from the right. The side planes of the head are in light, whereas the front planes of the face are in shadow. Light and shade define the meeting places of front and side planes. It is most important that such definition be established by line or by light and shade; otherwise the forms of the head and face will appear flat.

The merging of the front and side planes of the nose (D) is emphasized by the abrupt change from light to shade. The ridge of a form, the juncture of two planes, should be initially established by drawing a line.

More-rounded forms are indicated by a more gradual transition of value from light to dark. Because of this gradual progression, the forehead and neck appear more rounded than do the nose, mouth, and chin on which the change from light to dark is abrupt. The nose, mouth, and chin are blocklike in appearance.

The ear is beautifully drawn and positioned. Its front border is located at the half-way point of the side of the head. If this were a straight profile view, the top of the ear would appear level with the brow, and the bottom of the ear would appear level with the bottom of the nose. But since the head is tilted downward, the ear correspondingly tilts upward in contrast to the nose and oval of the face. The more the head is tilted, the more the relationships between features change.

After pinpointing the correct location of the ear, you should generally establish its outside shape. Note Michelangelo's careful attention to the tubelike cartilages of the ear: the rim, or helix (E); the Y-shaped inner cartilage of the antihelix (F), which curves downward alongside the helix; the two small projections of the tragus (G) and antitragus (H). *Tragus* comes from the Greek word meaning "goat's beard"; it is here that hairs in the ear occur. The cartilages surround and define the hearing canal, or concha (I). The earlobe (J) is handsomely decorated with the earring. The cartilages forming the ears and nose continue to grow throughout our lifetime, which means old folks sometimes have extraordinarily big ears and noses!





IDEAL HEAD, 1516, red chalk 8" × 6½" (205 × 165 mm)

The Relationship of Value to Line

If you can apply light and shade to a cylinder, you can draw the neck of a model. Often the head casts a shadow on the neck. Michelangelo knew that such dark spots could spoil the subtle effect of light. It is interesting to note that at times, he omitted or just barely suggested such cast shadows (A). There are few extremely dark tones in the eye

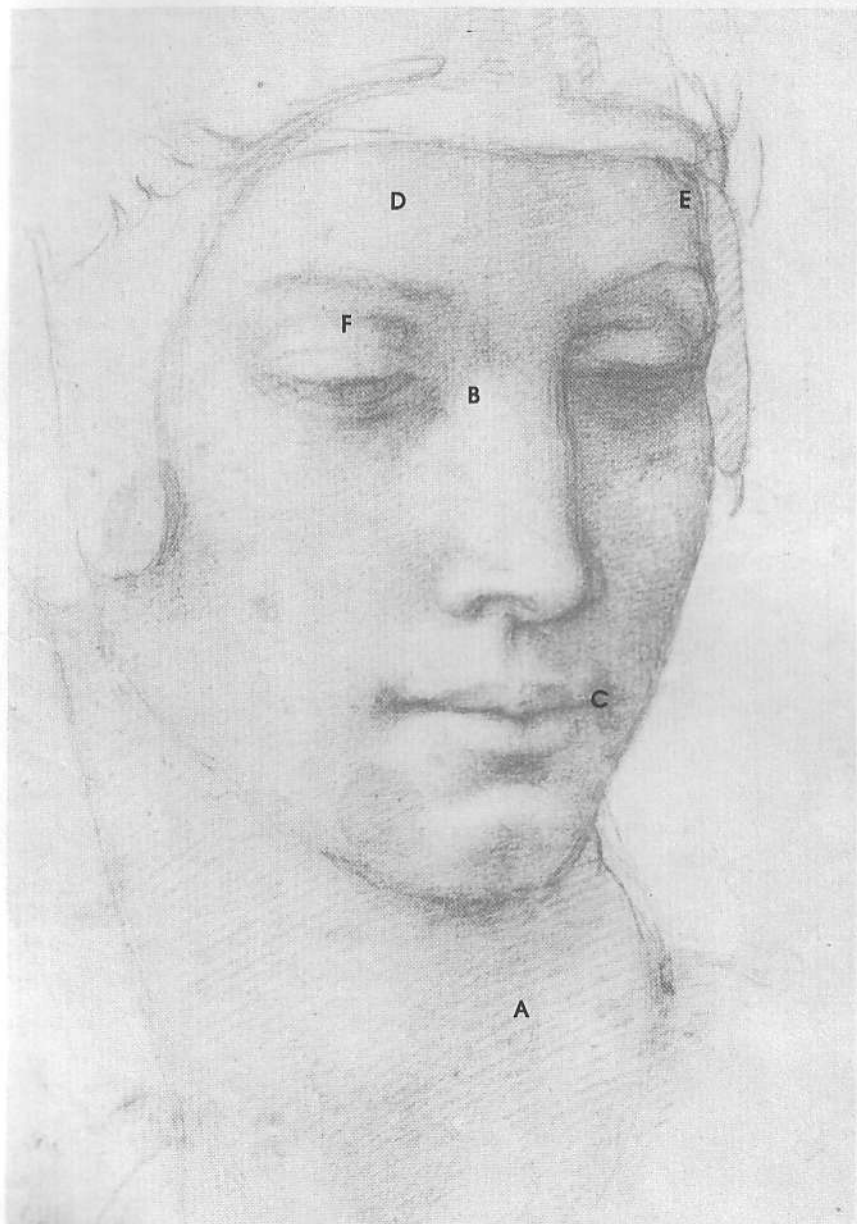
socket area (B), and the cast shadow from the nose (C) is also quite subtle. As a rule, Michelangelo was extremely careful about cast shadows and other dark tones used to define forms in light areas of his drawings.

You can understand how the direction of this head was established by visualizing two important construction lines; imagine a horizontal line running through the eyes and a vertical line running through the center of the face. The nose is beautifully drawn and perfectly placed consistent with the direction of the mass of the head. It might be helpful to think of an imaginary arrow piercing the back of the mass of the head, at the level of the bottom of the nose, and coming out the front of the head at the same level. This arrow would indicate the direction in which the nose should be drawn.

The lines of this drawing are very expressive and are related to all the other elements of drawing. Lines used to define forms often take the values applied to the larger masses in the areas that they pass over. For example, the line of the hat is a contour that is drawn over and explains the shape of the forehead. This line is very light as it travels through the highlight area (D) of the mass of the head and becomes darker as it moves into the shadow area (E). The mass of the face is shaded much as a large egg would be. The light is falling from above left and toward the front. Such a lighting scheme insures that three-fourths of the head is in light while one-fourth is in shadow.

The lines used on the left side of such forms as the eyebrows, the lids of the eye, the wing of the nose, and the lips are all lighter in tone than the lines used on the right side.

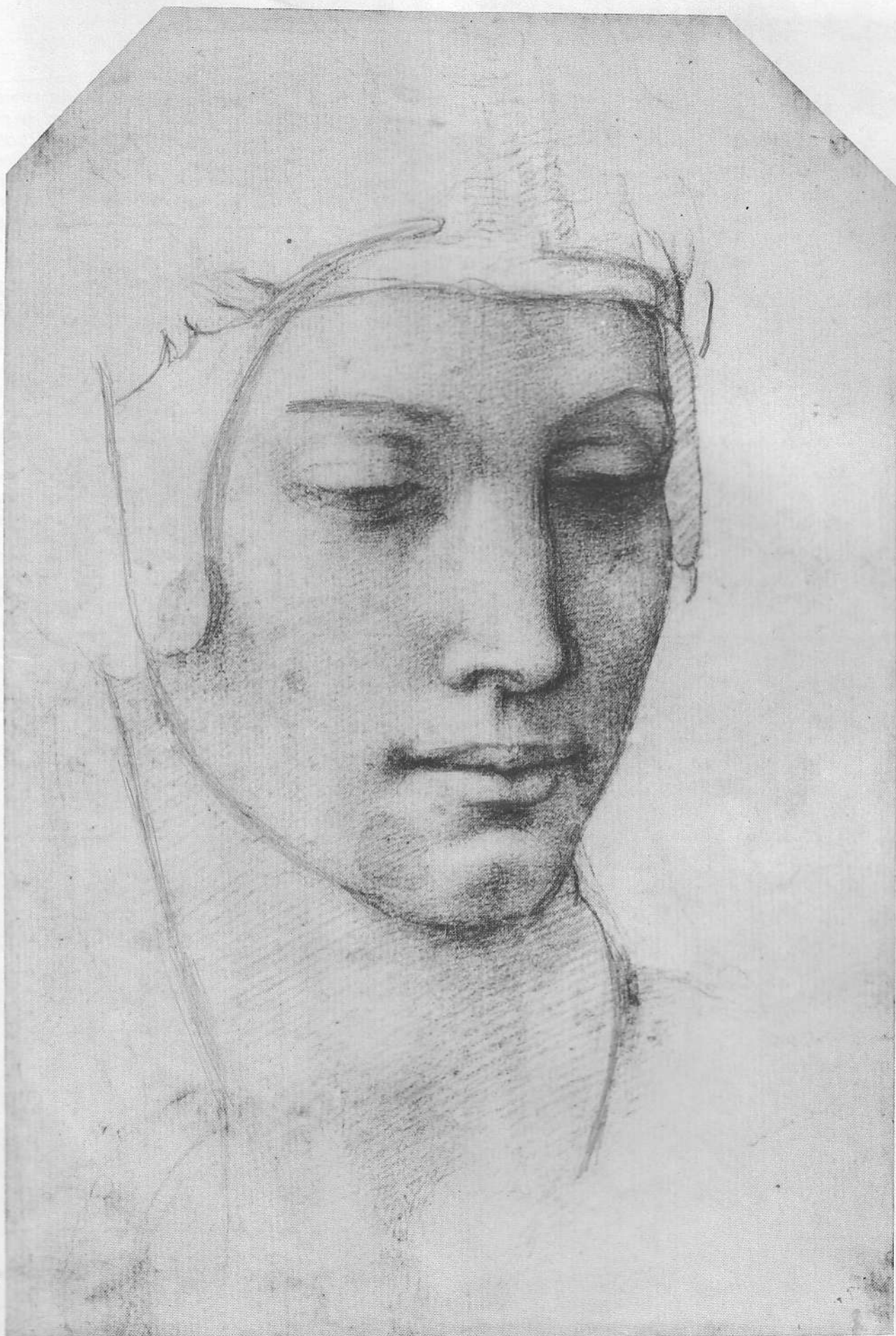
The eyebrow is also represented by lines that echo and explain the form above the eye. The separation between the front and side of the forehead occurs at F. The curved lines used for the eyelids define the rounded form of the eyeball, and these lines curve slightly upward, indicating that the head is tilted slightly downward. The line used to separate the lips also curves slightly upward. Straight lines anywhere on the figure tend to destroy the illusion of rounded form.



HEAD OF FEMALE FIGURE

black chalk

8 3/8" x 5 5/8" (21.27 x 14.29 cm)



Shaping the Nose and Mouth

The lighting scheme employed here was a favorite of Michelangelo's, a single light source from the left toward the front and above the figure. Lines as well as light and shade in Michelangelo's drawings are always based on the artist's profound understanding of form. The values can be thought of as thin layers of skin placed on the solid sculptural forms of the figure. As in the drawings seen earlier, eyelid lines are carefully drawn here to convey a sense of the mass of the eyeball. Artists rarely indicate the eyelashes because they have so little form.

Michelangelo's understanding of the parts of the nose are clearly demonstrated here. The area between the brows, above the nose, is called the glabella (A). It is a downward sloping plane, which curves under and away from the light source emanating from above. Subtle gray tone applied to the glabella suggests this curving away from the light. Directly below the glabella is the plane created by the bridge of the nose, which is composed of two small nasal bones (B). This plane, which is flooded by light, widens as it slopes downward and terminates on a level that corresponds with the inner corners of the eyes. The lower half of the cylinderlike stem of the nose becomes more narrow as it extends down into the bulb of the nose (C). The lower end of the nose is formed by three small, rounded,

yet blocklike masses—the bulb, in the center, and the wings on either side, which are partially embedded in the central and slightly larger bulb. Notice how Michelangelo's masterful manipulation of value causes certain areas of the nose to advance while other areas recede. The relationship between the forms of the head in terms of depth is always well considered by Michelangelo. For instance, one feels that in his drawings the nose is clearly forward of the eyes and that the eyes are clearly forward of the ears.

Michelangelo's drawings of mouths never look flat. In this drawing there is a clear sense of the mouth curving around the tooth cylinder of the underlying skull. The upper lip, which is a downward sloping plane, receives less light than does the lower lip, which slopes upward. The lower lip in this drawing has been shaded as one would shade a horizontal cylinder. The upper lip is made up of three forms—one in the middle and one on each side—while the lower lip is made up of two forms.

Once the structure of the head is established, you should take care to decide on the exact location of the features. A good eye in the wrong place is worse than a bad drawing of the eye in the right place! Visualize a grid of horizontal and vertical lines across your model's face so that you can determine the relationship of the features.





ANDREA QUARATESI 1532, black chalk 16 $\frac{1}{10}$ " \times 11 $\frac{3}{5}$ " (41.1 \times 29.2 cm)

The Muscles of Expression



STUDY FOR THE HEAD
OF THE DONI MADONNA
1503-4, red chalk
7⁷/₈" x 6³/₄" (20 x 17.15 cm)

The dominating form of the head is the skull. The ability to draw the head well is based on an understanding of the shape of the skull. There are a few very thin muscles of the face that fill out the bony structure of the skull. These are the muscles of expression. Additionally, there are two muscles on the head, which move the lower jaw, or mandible, and are used for chewing food.

The muscles of expression are structurally very different from the muscles of the body. The muscles that move the body originate at one bone and insert into another bone. The muscles of expression also originate on bone, on the skull, but they insert into the skin of the face. When these muscles contract, they pull the skin, producing various facial expressions.

The occipito-frontalis muscle (A) covers the back, top, and front of the cranium. This muscle, originating in fibers on the back of the

cranium, has a tendinous sheet that extends over the top of the cranium to the forehead, where fibers again occur. At the forehead the muscle terminates in the skin above the eyebrows. The occipito-frontalis has the function of lifting up the eyebrows, creating horizontal wrinkles on the forehead as seen in the expression of surprise or attention.

The eye is surrounded by several muscles. These include two sets of circular muscles: the inner and outer rings of the orbicularis oculi (B and C). The inner rings, or palpebral part (B), are responsible for opening and closing the eyelids. The outer ring, or orbital part (C), above the eyes, when contracted will pull the skin between the eyebrows slightly downward, causing short vertical wrinkles to appear between the brows. This muscle expresses the reflective or meditative state.

Another muscle in the eye area is the cor-

rugator of the eyebrow, or corrugator supercilii (D), a very small muscle originating on the forehead, under the occipital frontalis muscle. The corrugator inserts into the skin at the midpoint of the eyebrows, pulling them inward and upward creating expressions of pain or worry.

One of the muscles of the nose is the pyramidalis nasi (E). It arises from the nasal bones and extends upward to insert into the skin between the eyebrows. This muscle pulls the skin above the nose downward, creating short horizontal wrinkles at the bridge of the nose characteristic of the expression of anger.

One of the chief muscles of the mouth is the zygomaticus major (F). It originates at the lower border of the cheekbone, or zygomatic bone, and extends down to insert near the corners of the mouth. When contracted, as in the expression of laughter, this muscle pulls the corners of the mouth upward and to the side.

The zygomaticus minor (G), another mouth muscle, arises from the front of the zygomatic bone, closer to the nose. The elevator of the upper lip, or levator labii superioris (H) rises from the lower border of the eye socket, or orbital cavity. These two muscles extend down to insert into the orbicularis oris in the area of the upper lip. They have the function of lifting the upper lip near the midpoint while the corners of the lip drop down, as in expressions of grief.

The orbicularis oris (I), a circular muscle which surrounds the mouth, has the function of closing the mouth. Its outer fibers blend with and can act against the various other muscles that are attached to it.

Another muscle of the mouth, called the elevator of the upper lip and the wing of the nose, or levator labii superioris alaeque nasi (J), is a thin muscle originating from the upper part of the upper jaw, or maxilla, extending downward to insert into the wing, or ala, of the nose and the upper lip. These forms are lifted in the action of sobbing.

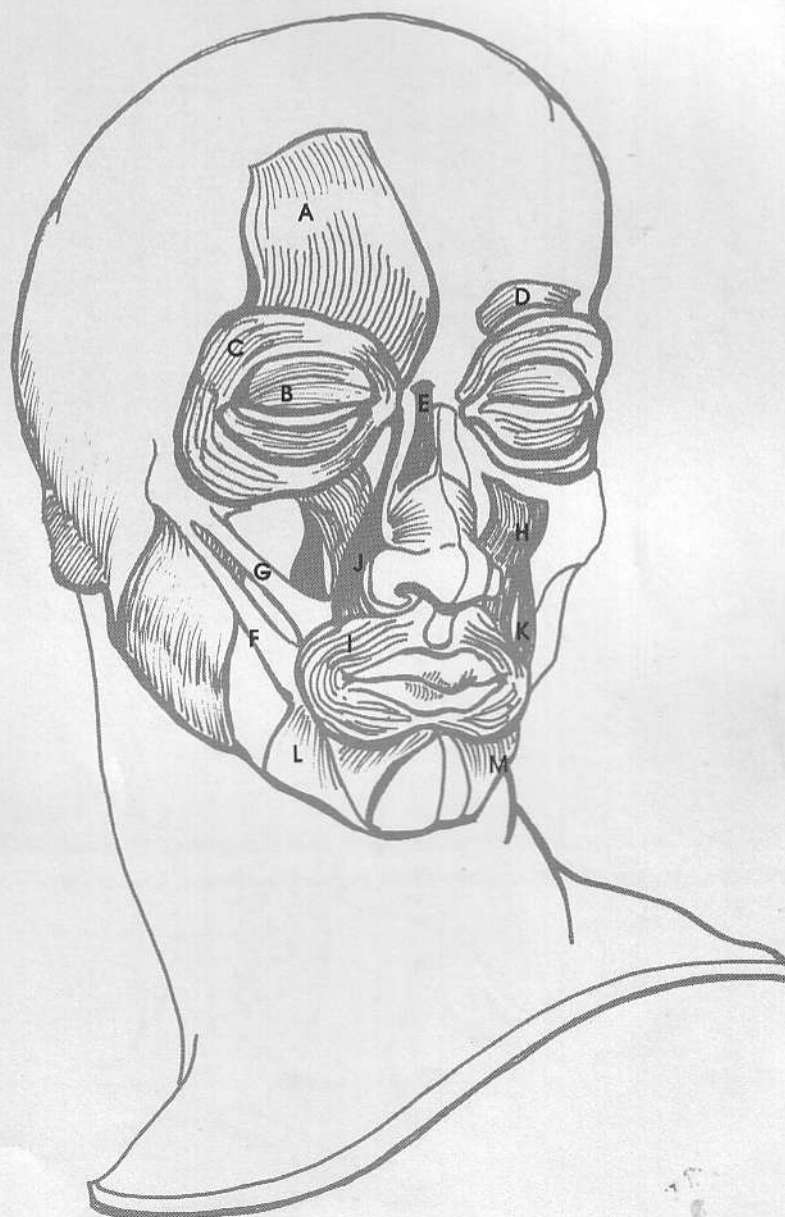
The caninus, or levator anguli oris (K), arises from the maxilla and inserts into the skin above the canine tooth. This muscle lifts the upper lip, exposing that tooth to give a sneering expression.

The depressor of the angle of the mouth, or depressor anguli oris (L), arises from the mandible, or lower jaw, and extends upward to insert into the corners of the mouth. The function of this muscle is to pull the corners of the mouth downward in expressions of agony.

The depressor of the lower lip, or depressor labii inferioris (M), also originates on the mandible. From there the muscle extends up to

insert into the muscle fibers surrounding the mouth at the lower lip. The depressor labii inferioris pulls the lower lip down in the actions of crying.

You must understand that these muscles of expression are all interconnected with one another in their particular areas; thus in the subtle movements of the eye area or the mouth region, several small facial muscles may be involved in one expression. Or the face may be expressing more than one emotion. In a drawing of the head such as this one, Michelangelo does not draw the individual facial muscles; he masses them, but he certainly knows all about them and translates them into a drawing of the head that shows a great deal of expression.



The Muscles of the Jaw

The two muscles of mastication extend downward from the immovable skull to the movable lower jaw. On the back part of the cheek is the masseter muscle (A), which extends downward and backward from the zygomatic arch of the skull to the angle of the lower jaw. By being aware of the position of this muscle, you can understand its function, which is that of raising the lower jaw. This powerful muscle can be felt by clenching the lower jaw. Its thick front border creates a shallow depression on the face, directly in front of the muscle.

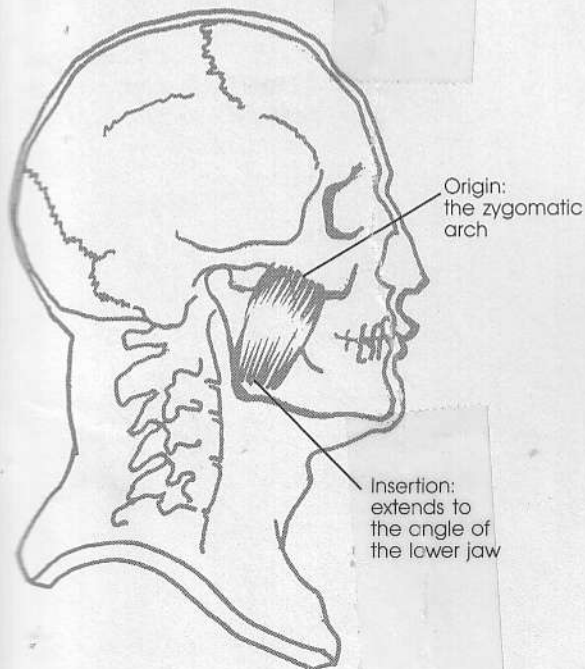
The temporalis muscle (B) is located on the side of the cranium in the temporal fossa. Its fibers pass downward under the zygomatic arch and insert into the coronoid process on the lower jaw. This muscle works with the masseter muscle to raise the lower jaw. When a person chews, the alternating contraction and relaxation of the temporalis muscle is apparent on the side of the head in the area of the temples. Ancient anatomists named this muscle and this area of the skull temporalis, relating to time, because it is here that hairs turn white so quickly.



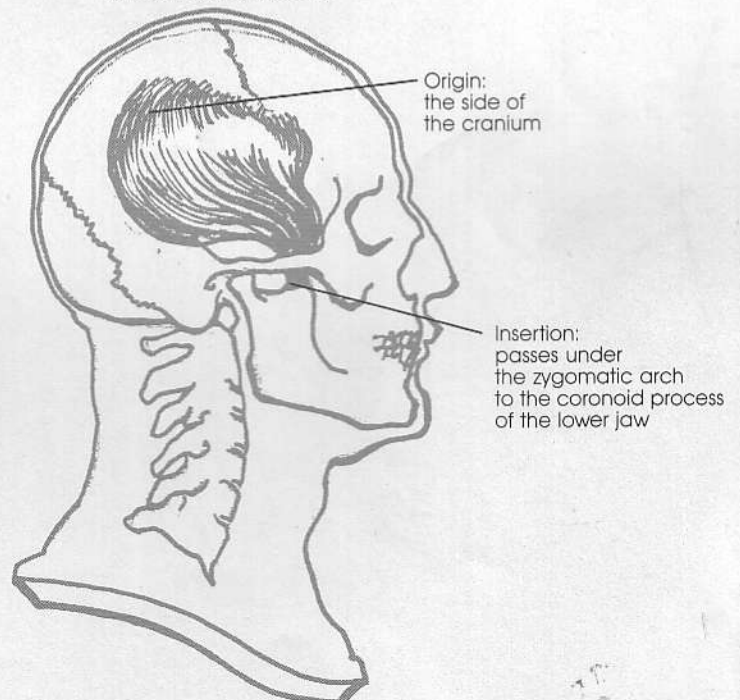
SKETCH OF A HEAD FOR THE LAST JUDGEMENT 1534, black and red chalk 15¼" × 10" (38.74 × 25.40 cm)



THE MASSETER MUSCLE

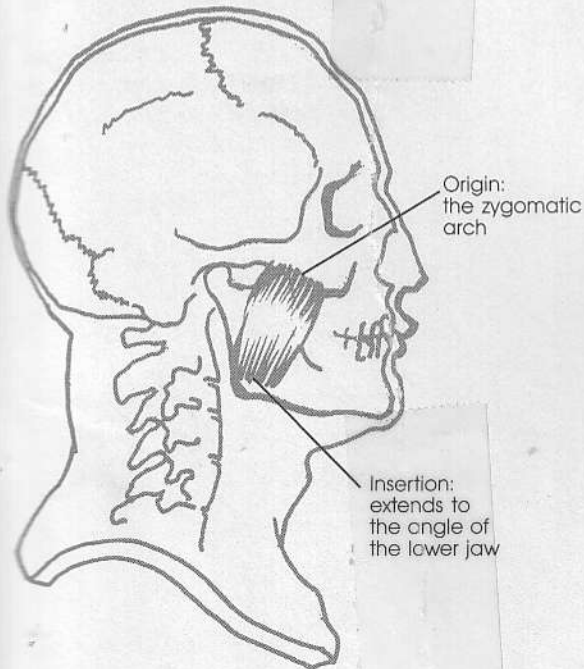


THE TEMPORALIS MUSCLE

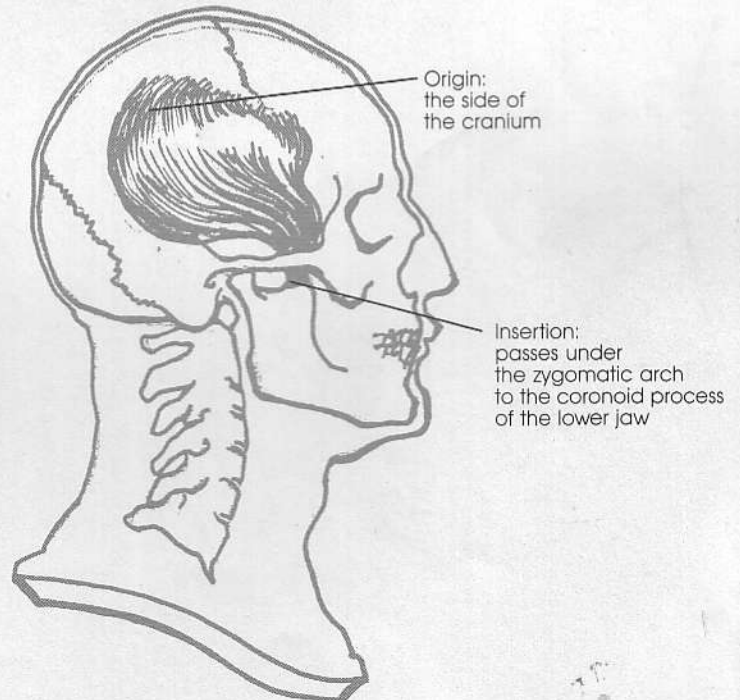




THE MASSETER MUSCLE



THE TEMPORALIS MUSCLE



The Forms of the Neck



The artist first sees form in terms of simple mass before going on to smaller forms and detail. The neck is essentially a cylinderlike mass. Michelangelo never failed to emphasize the cylindrical quality of the neck, which is wider at the base than at the top. The neck assumes a cylindrical shape because the first two ribs, which form the base of the neck, are circular. The higher level of the neck in the back than in the front of the body results in a forward thrust more dramatic in women than in men. The sides of the neck cylinder are formed by three scalenus muscles—anterior, medius, and posterior. These muscles extend upward from the first two ribs to the upper neck vertebrae. The scalenus muscles cause the neck to bend.

On the front of the neck there are important forms that project outward from the cylinder mass. These are the cartilages around the windpipe, or trachea, which form the voice box, or larynx. The shape of the larynx is that of an upside-down triangle. The apex of the triangle is located at the pit of the throat (A), and the upper border corresponds to a level just below the lower jaw. The part of the voice box that Michelangelo was most interested in portraying here is the upper edge (B), which projects to form the Adam's apple.

Another form that Michelangelo was well aware of is the hyoid bone, a small horse-shoe-shaped bone above the Adam's apple that helps hold the windpipe in place. This small bone is not visible on the surface, but occurs where the under plane of the lower jaw separates from the front plane of the neck.

The throat muscles rest over the cartilages of the voice box. These thin muscles are massed, and they form the general cylinder shape of the front of the neck.

THE SCALENE MUSCLES

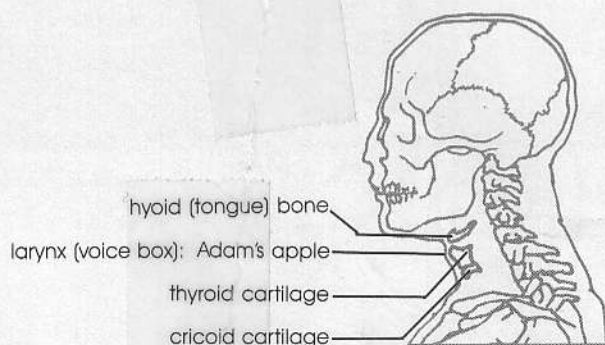
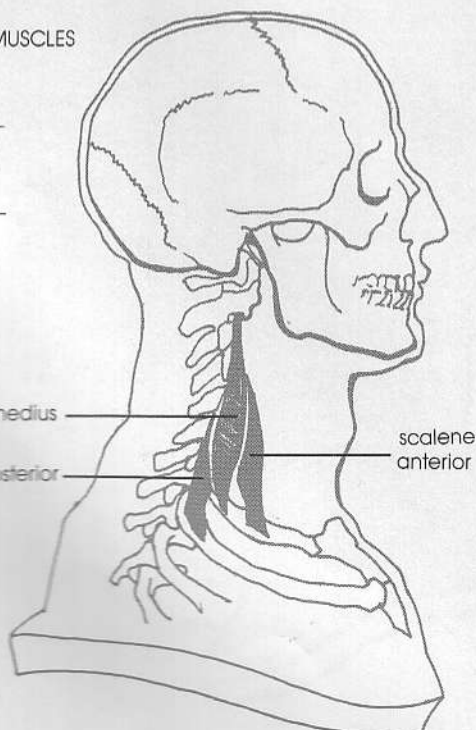
Origin—
from the upper
neck vertebrae

Insertion—
two ribs

scalene medius

scalene posterior

scalene
anterior



STUDY FOR THE HEAD
OF AN EVANGELIST

1517-18, red chalk

11 1/8" x 7 3/4" (28.26 x 19.69 cm)



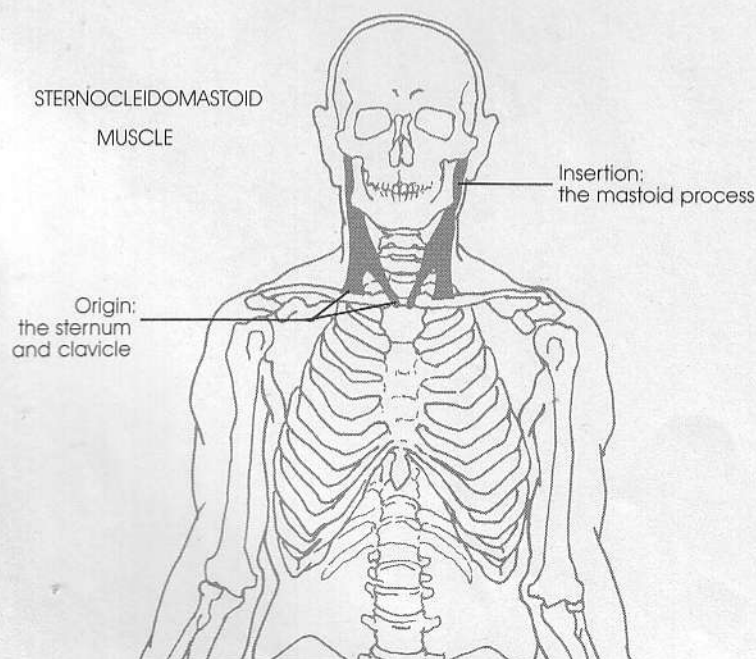
The Sternocleidomastoid Muscle



The two sternocleidomastoid muscles rest on, and are partially embedded in, the cylinder mass of the neck. They are ropelike muscles that extend from the top of the sternum up to the head behind the ear. They insert into the mastoid process (A) of the skull. Each muscle is at its widest about halfway down the neck. At its lower end it branches off into two tendons: one tendon is attached to the top of the sternum (B), and the other is attached to the clavicle (C). These two tendons create a small triangular depression (D); the head of the clavicle is at the base of this depression. The tendon that attaches to the top of the sternum is very pronounced and cordlike, while the one that attaches to the clavicle is rather flat and broad. The tendons that attach to the sternum form the pit of the throat (E). If the sternocleidomastoid muscle on one side of the neck contracts, the head will rotate in the opposite direction or tilt downward toward the shoulder. These two muscles usually work against each other, but when they do work together, they cause the head to be thrown up while simultaneously pulling the neck down.

Michelangelo has drawn the sternocleidomastoid muscles in a subtle way because, as has been noted, they are details on and partially embedded in the larger mass of the neck. They must not appear too prominent. In this drawing a small portion of the large trapezius muscle is visible (F). Between the sternocleidomastoid muscle and the trapezius is a rather large triangular depression called the "anatomical saltbox" (G).

The neck is constructed for great freedom and variety of movement. The shoulder girdle (two scapulae and two clavicles) is the skeletal structure upon which the fleshy forms attach.

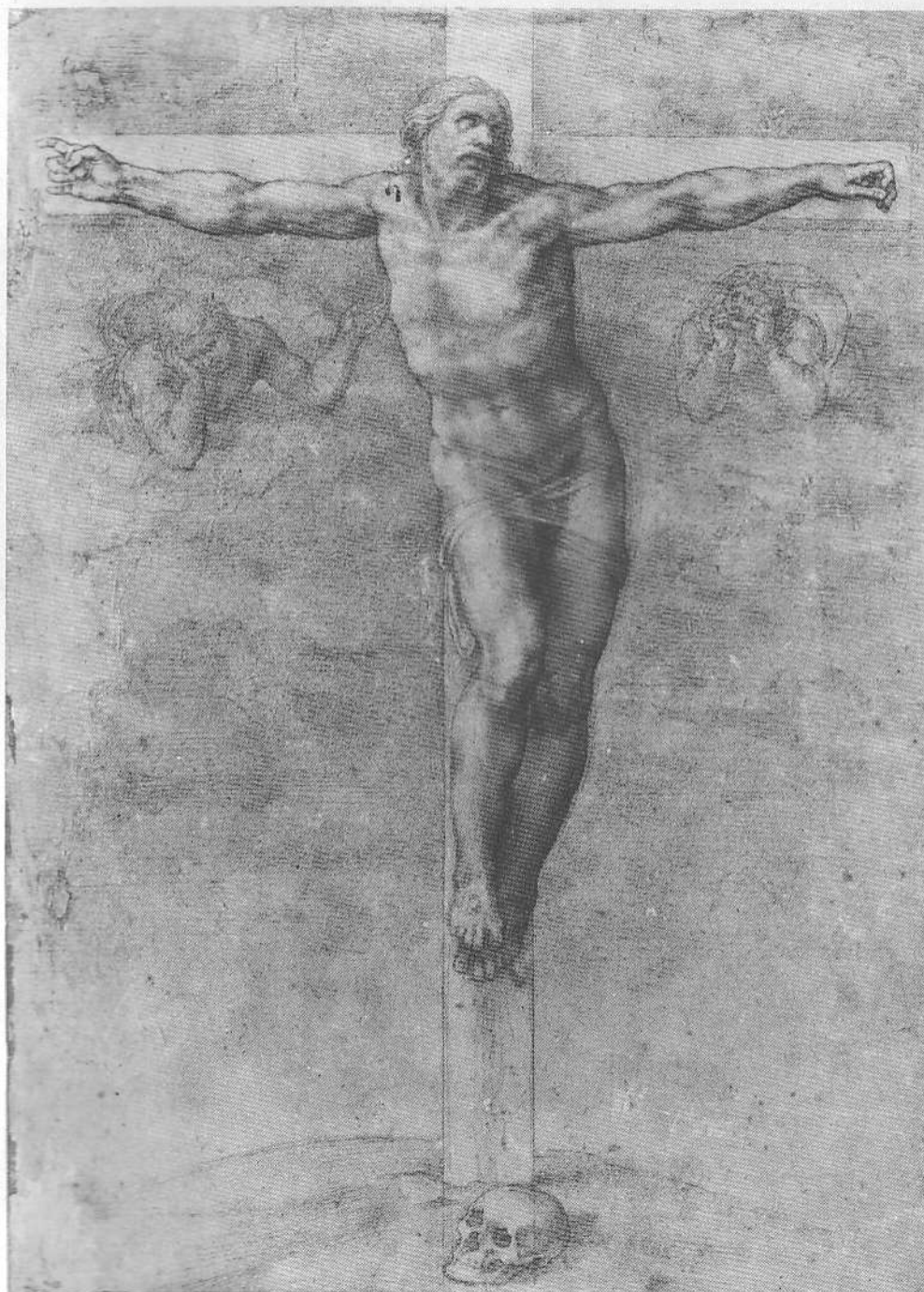


STUDY FOR HEAD OF THE NUDE
 AT LEFT ABOVE PERSIAN SIBYL
 1511, red chalk
 14 1/8" x 7 5/8" (35.88 x 19.37 cm)



CHAPTER THREE

THE TORSO: ANTERIOR REGION



CHRIST ON THE CROSS, black chalk 14½" × 10¾" (37 × 27 cm)

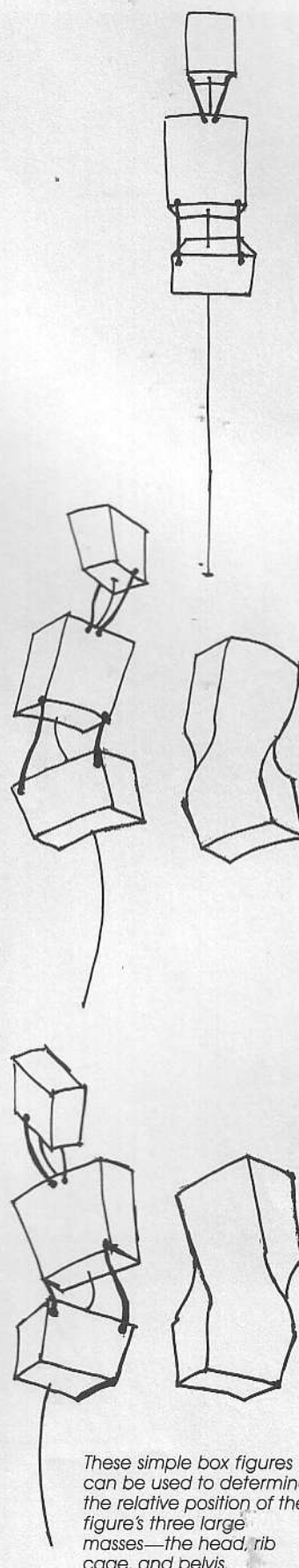
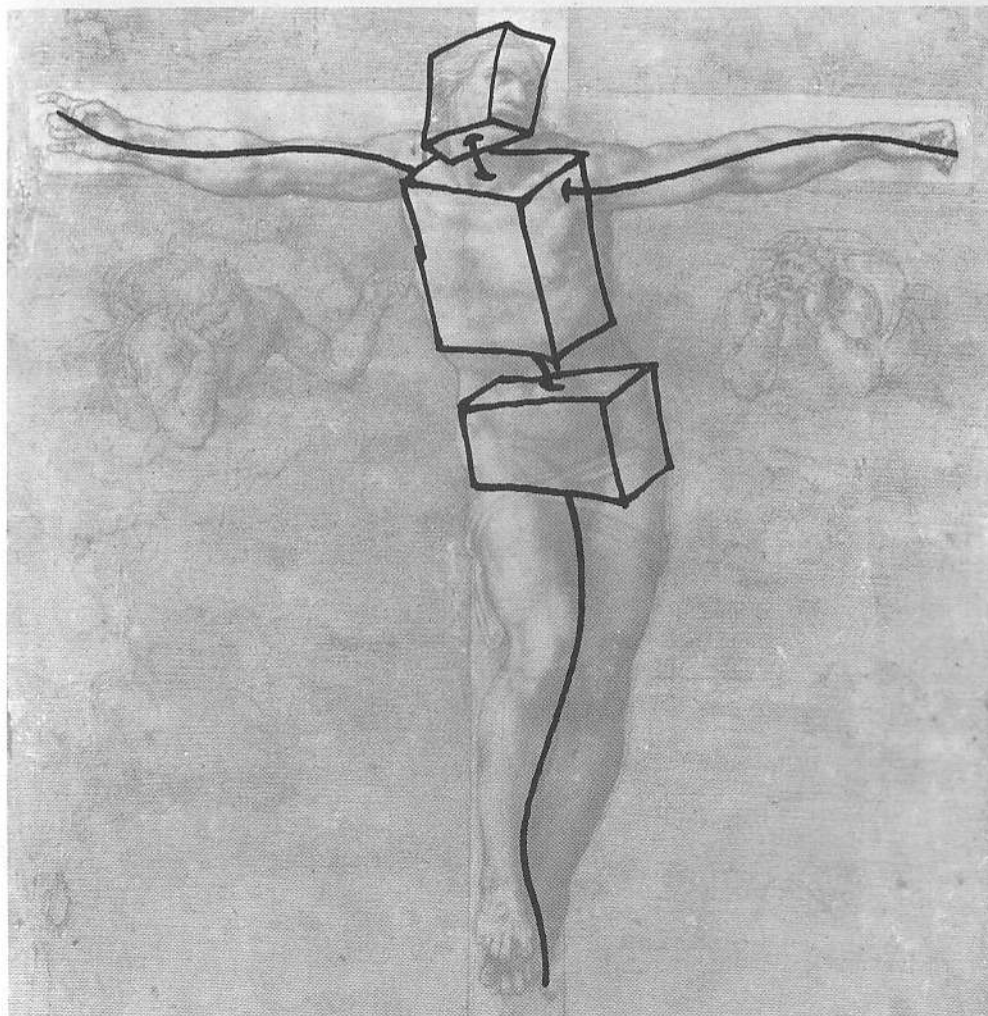
Placing the Large Masses of the Body

Any form that the artist draws will obviously have a certain position and direction relative to the space that surrounds it. The position is determined by the location of the object in space; the direction is determined by which way the object is facing. Imagine an axis placed vertically through the center of the object. Now imagine that the object rotates around this axis. The degree of rotation is of course the object's direction. The questions an artist asks before drawing a figure are: What is the direction of the part of the body I am drawing? Is it directed toward the left or the right and by how much? How far forward or backward in space is the form leaning? Furthermore, the artist must consider the relationship of his own position in space to that of the object being drawn. He does not have to draw the object in the position from which he views it, but if he does not, he must determine the position from which the form is to be drawn, and he must mentally accommodate this discrepancy.

Michelangelo determined the position of this figure very carefully in advance. You are

looking up at the body of Christ, but you are looking down on his feet and at the skull at the base of the cross. The head of the figure is directed to the right; the rib cage is turned toward the left and is tilted forward; the mass of the pelvis is turned slightly to the right and tilted forward toward the left.

There are three important large masses of the human figure: the head, the rib cage, and the pelvis. As has been shown in the earlier study of the head, it is most important to notice and decide how you are going to place the large masses in space before you start drawing the figure. It is helpful, from the beginning, to draw these masses as simple forms, for example, an egg, sphere, cylinder, or block. It is much easier to place a complex form like the rib cage in a difficult position by drawing a simple block in that position first. You can then sketch in the rib cage over the block. Since the human figure is the most complex form an artist can draw, it is necessary to see right through all the intricate and confusing details to the large, simple masses underneath.



These simple box figures can be used to determine the relative position of the figure's three large masses—the head, rib cage, and pelvis.

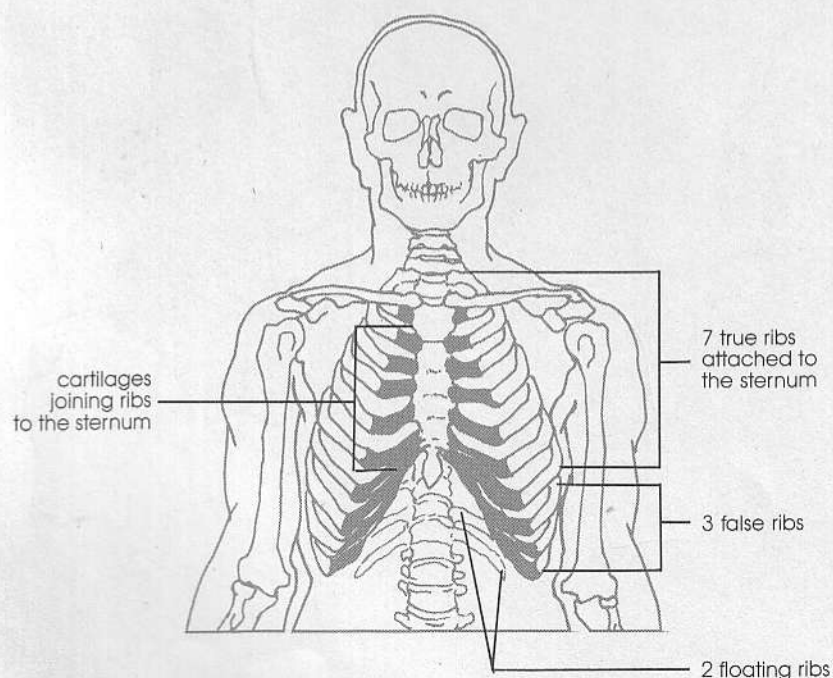
Massing the Rib Cage



Knowing how to depict accurately the mass of the rib cage (A) is the key to capturing the overall form of the upper torso. Accurately rendering the rib cage will also make it possible to record correctly the details on the surface of the torso.

The rib cage is the largest and most important form of the upper torso area. It is the mass on which all other smaller surface forms rest. The shape of the rib cage is not unlike that of a cone, pear, barrel, or egg. When drawing the breast muscles and the breasts, you should always be conscious of this larger underlying mass. In Michelangelo's drawings of the figure the rib cage is always clearly indicated.

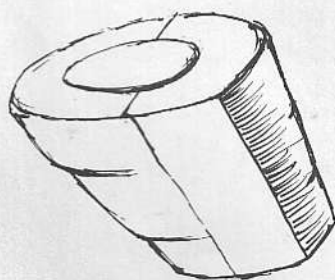
The rib cage protects the heart and lungs. It is made up of twelve pairs of ribs. The ribs are attached to the rib, or thoracic, vertebrae of the backbone; they extend around the body to connect in front to the sternum. The ribs are not, however, attached directly to the sternum; they are connected to it by rib, or costal, cartilages. Ribs are parallel to one another and are higher in back than in front; the direction, or movement, of ribs is thus downward from back to front. Visualize, for a moment, one side of the rib cage. Since the first seven ribs are attached by cartilages directly to the sternum, they are called true ribs. The next three ribs, the false ribs, are attached by cartilages to the cartilage of the last true rib. The last two ribs, the eleventh and twelfth are called floating ribs; they have a free extremity that rests among the muscles of the abdomen. The ribs vary in length corresponding to the egglike shape of the rib cage. Their length increases from the first to the eighth rib. At this level, which is slightly below the bottom of the sternum, the rib cage is at its widest. From the eighth and the twelfth rib the rib cage again becomes narrow.





LAMENTATION OVER THE DEAD CHRIST
1534-38, black chalk
11 1/2" x 10 1/4" (28.2 x 26.2 cm)

Positioning the Rib Cage in Space



The thrust and angle of the rib cage can be visualized more readily when conceived as a large blocklike mass.

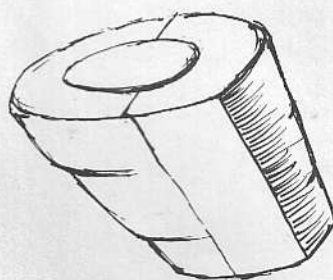
This is a remarkable drawing showing a powerful forward thrust of the rib cage. The two clavicles extend from the top of the sternum (A) to the summit of the shoulders (B and C). Notice the S-shape of the clavicle and see that together they form a shape not unlike Cupid's bow.

It is important to work from a geometric form that is appropriate to a given pose in order to simplify complex forms of the figure. If you ignore the detail in this drawing, you can visualize the rib cage as a large, blocklike, forward-tilting mass. Seeing the figure in this

way clarifies problems of proportion, direction, and light and shade. Because of the foreshortened character of this drawing, the lower portion of the rib cage appears narrow in proportion to the upper portion.

Michelangelo used line to define the anatomical perfection of this figure. Notice the series of overlapping lines originating at the shoulder (D) and extending downward along the outer edge of the torso to the bottom of the rib cage (E). This overlapping of line greatly enhances the illusion of the forward-tilted rib cage.

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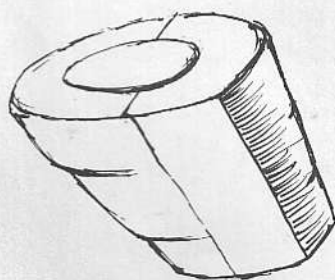
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STUDIES FOR ST. LAWRENCE 1534-35, black chalk 9½" × 7¼" (24.13 × 18.42 cm)

Positioning the Rib Cage in Space



The thrust and angle of the rib cage can be visualized more readily when conceived as a large blocklike mass.

This is a remarkable drawing showing a powerful forward thrust of the rib cage. The two clavicles extend from the top of the sternum (A) to the summit of the shoulders (B and C). Notice the S-shape of the clavicle and see that together they form a shape not unlike Cupid's bow.

It is important to work from a geometric form that is appropriate to a given pose in order to simplify complex forms of the figure. If you ignore the detail in this drawing, you can visualize the rib cage as a large, blocklike, forward-tilting mass. Seeing the figure in this

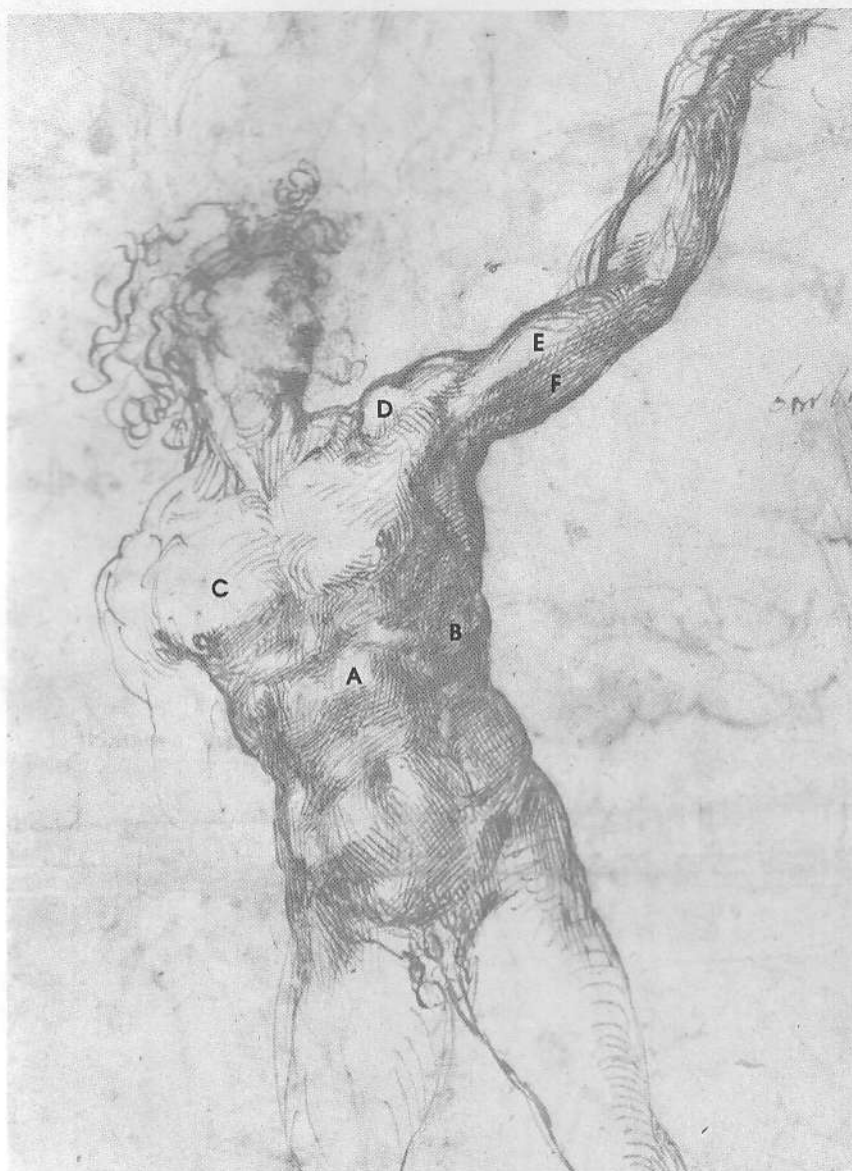
way clarifies problems of proportion, direction, and light and shade. Because of the foreshortened character of this drawing, the lower portion of the rib cage appears narrow in proportion to the upper portion.

Michelangelo used line to define the anatomical perfection of this figure. Notice the series of overlapping lines originating at the shoulder (D) and extending downward along the outer edge of the torso to the bottom of the rib cage (E). This overlapping of line greatly enhances the illusion of the forward-tilted rib cage.



STUDIES FOR ST. LAWRENCE 1534-35, black chalk 9½" × 7¼" (24.13 × 18.42 cm)

The Planes of the Torso



Consider what portions of the various parts of the figure you are looking at in this drawing. Do you see the top, front, side, or all of these? These are the planes of a form.

Disregarding details for a moment, think of the torso as a large block created by the front plane (A) and the side plane (B). The side planes of the torso are at a slight obtuse angle to the front plane, making the back wider than the front of the torso.

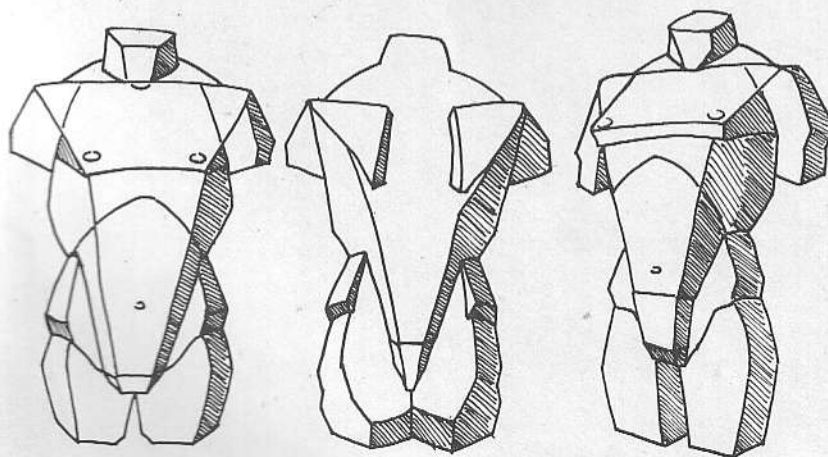
Imagine a series of lines running from the top of the shoulders to the nipples, from shoulder to shoulder, and from nipple to nipple. These lines would define the big top plane of the chest (C), which is wider at the shoulder than at the nipples; this plane includes the front plane of the deltoid muscle (D).

You may notice that the accurate definition of planes is directly related to the successful handling of light and shade. For instance, the arm on the right is drawn as a rounded block; the light top plane (E) is clearly separated from the plane in shadow (F).

The fact that both the front of the torso and a section of the side are visible gives a powerful illusion of the figure as a three-dimensional object in space.

The most intriguing thing about figure drawing is that it requires you to think and do several different things simultaneously. Since it is difficult in the beginning to do several things at once, it may be helpful to consider only one element at a time, even though it is understood that all elements of a drawing are interrelated. The elements of a good figure drawing are line, mass and detail, proportion, thrust, anatomy, perspective, light and shade, and planes.

When beginning a drawing, it is often helpful to consider only the planes. After you have established the outside shape of the figure, draw lines that separate one plane from another. Think of and draw the planes of the largest masses first; then go on to the planes of the smaller forms.

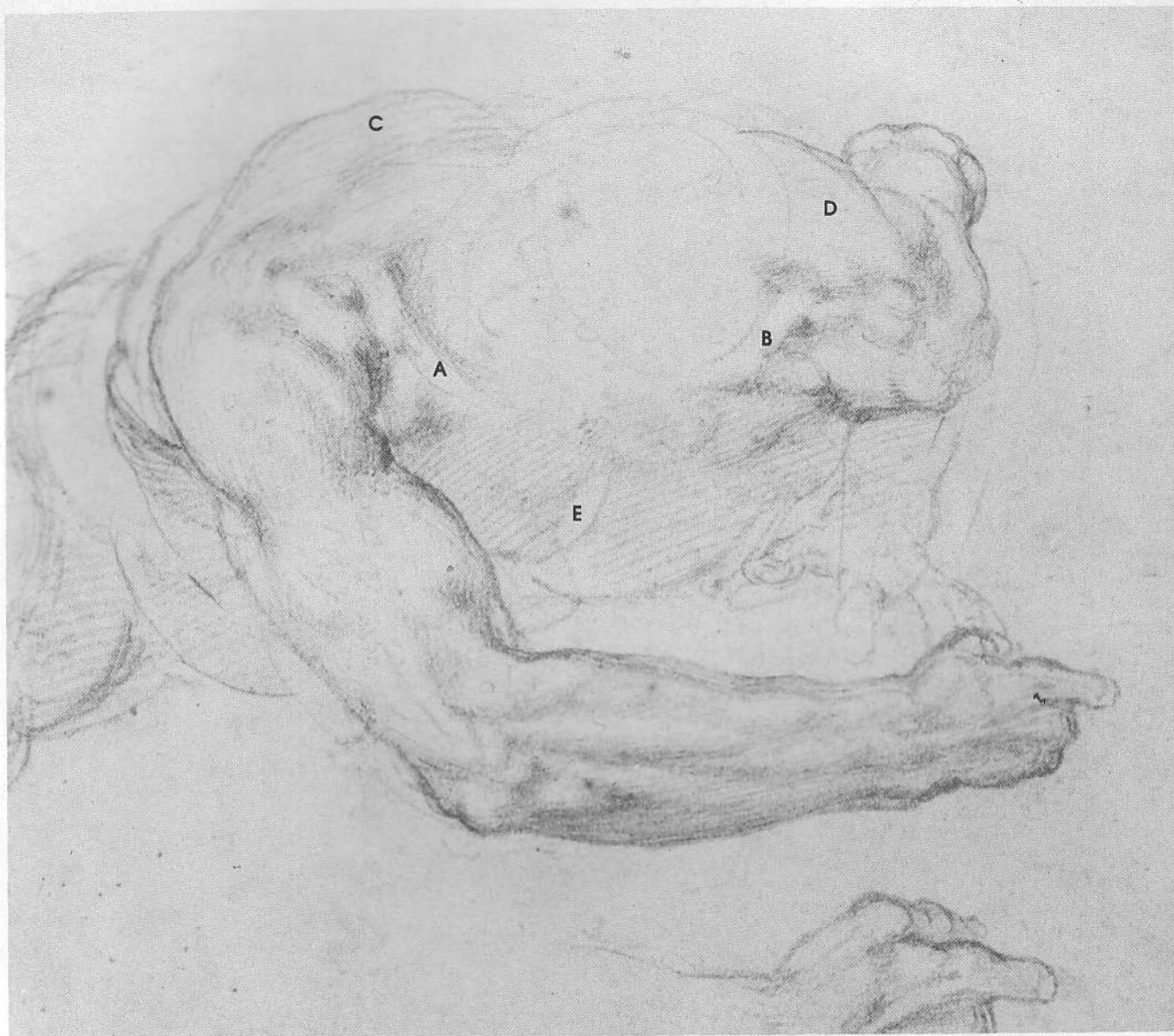


These simple drawings were done as preliminary sketches to determine the large planes of the torso from the front, back, and three-quarter's views.

NUDE MALE FIGURE RUNNING
 1496-1500, pen, brown ink, and black chalk
 14 3/4" x 9 1/8" (37.47 x 23.18 cm)



The Shoulder Girdle



In this strong drawing, which is less finished than the preceding drawing, the rib cage is dramatically tipped forward. It is clear that Michelangelo drew the figure while bearing in mind the top, or superior, view of that form.

The shoulder girdle, which rests on top of the rib cage, consists of the two clavicles (A and B) and of the two shoulder blades, or scapulae. The scapulae are both covered in this pose by the two masses of the trapezius muscle (C and D). The shoulder girdle is attached to the rib cage only at the pit of the throat where the clavicles meet the top of the

sternum. This slight attachment to the rest of the skeleton affords the two scapulae and two clavicles extensive mobility. Since the upper limbs are attached to the scapula by the shoulder joint, the arms are also only slightly attached to the rest of the trunk of the body and are also capable of great movement.

Viewed from the front, the clavicle appears as a straight line, but when seen from above, as it is in this drawing, its S-shape curve is apparent.

It is interesting to observe in such an unfinished drawing as this one which areas



Michelangelo decided to work on first and why. Those areas that project forward the most—the shoulders and the right arm—are the most developed. The head, however, has not yet been refined; evidently the artist wanted first to establish the symmetry of the shoulder girdle.

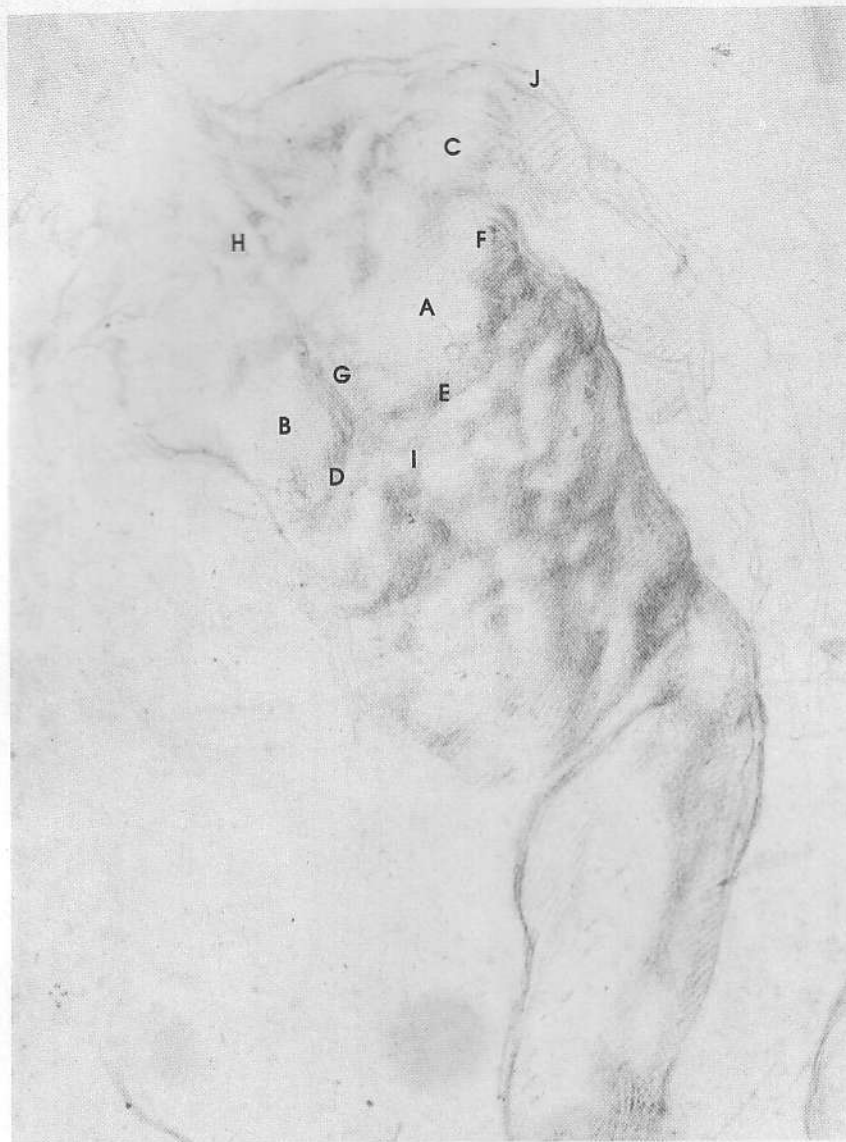
The position of the sternum is an important factor when drawing the rib cage in a difficult position. Viewed from the front, the sternum appears as a vertical line, but from the side the curve of this bone can be clearly observed. Here Michelangelo has drawn the

sternum (E) in a way that clearly defines the direction of the rib cage—forward thrusting and tilted downward toward the right. In this drawing the sternum appears much shorter than it really is.

Cover up the sternum with the tip of your finger and see how the direction of the larger mass, the torso, is weakened. Such smaller forms as clavicles, breasts, or the sternum, if drawn correctly in perspective, will greatly enhance the illusion of larger masses strongly pitched forward or back in space.

MAN RISING FROM TOMB
black chalk
8½" × 10⅞" (21.59 × 27.62 cm)

The Forms of the Chest

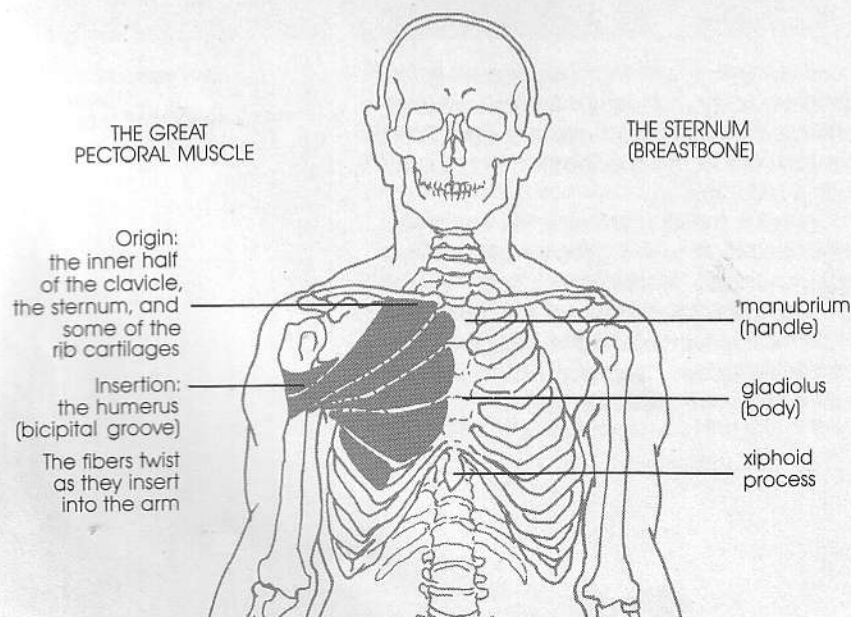


Here is a magnificent drawing of the torso. The breast muscles, the two great pectorals, pectoralis major (A and B), extend outward from the sides of the sternum and the internal half of the lower border of the clavicle to insert into the arm under the shoulder muscle, or deltoid (C). The fibers twist as they near the insertion point. The two great pectoral muscles are similar in shape to flat blocks, which wrap around the front upper half of the rib cage, giving it a somewhat flattened appearance in the upper region, or top shelf, of the chest. The great pectoral muscles cover the front of the rib cage from the clavicles to the level of the fifth or sixth rib. The lower borders of these two muscles are represented by two lines (D and E), which curve outward and downward from the sternum.

Michelangelo has indicated a small but important detail of this area. The fibers of the pectoral muscle near the arm are pushed forward by the deltoid muscle, creating a small egglike bulge (F) above the breast near the armpit.

A vertical groove (G) is the result of the protrusion of the pectoral muscles away from the sides of the sternum.

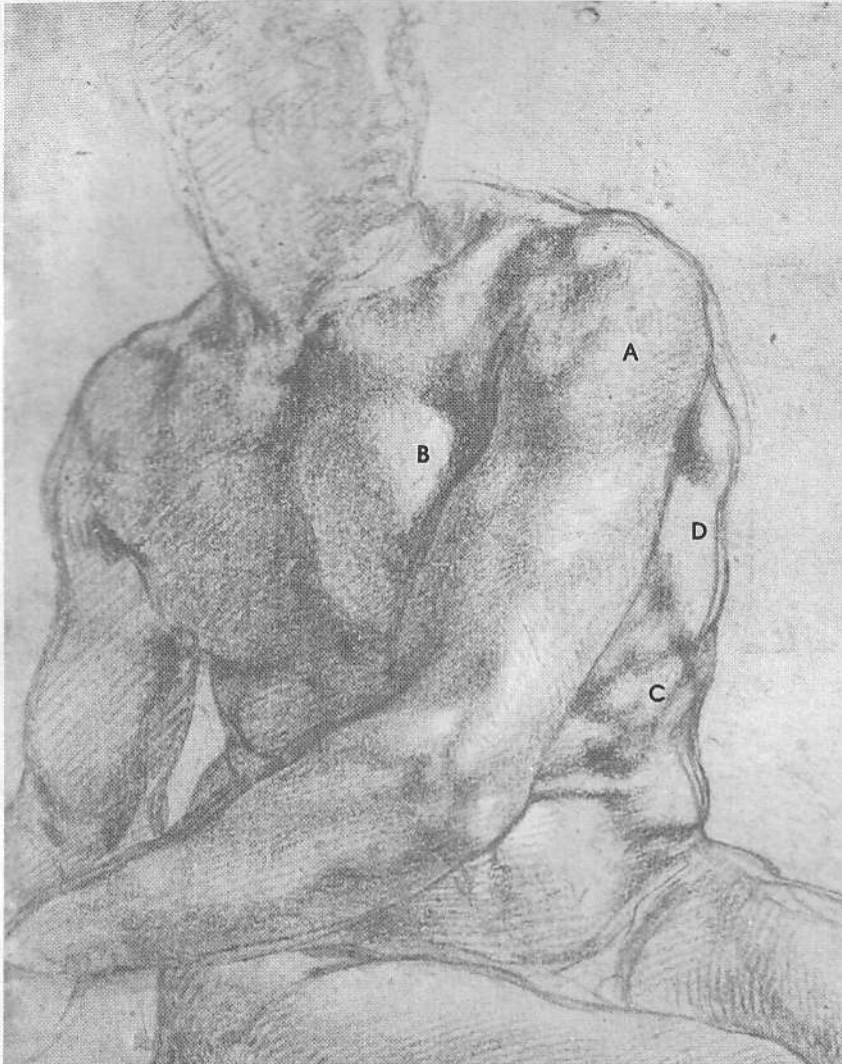
The sternum is shaped very much like a small Roman sword which points downward. It is composed of three parts: the handle, or manubrium; the body, or blade (sometimes called the gladiolus), which is the longest portion; and the xiphoid process, which represents the tip of the sword. The upper extremity of the sternum forms three notches: the center notch forms the pit of the throat (H). The inner end of each clavicle rests in the notches on either side of this central notch. The pit of the stomach (I) is formed by the xiphoid process.



STUDY FOR ST. BARTHOLOMEW
1534-35, black chalk
15 1/8" x 10" (39.69 x 25.40 cm)
Damaged



Overlapping Forms of the Torso

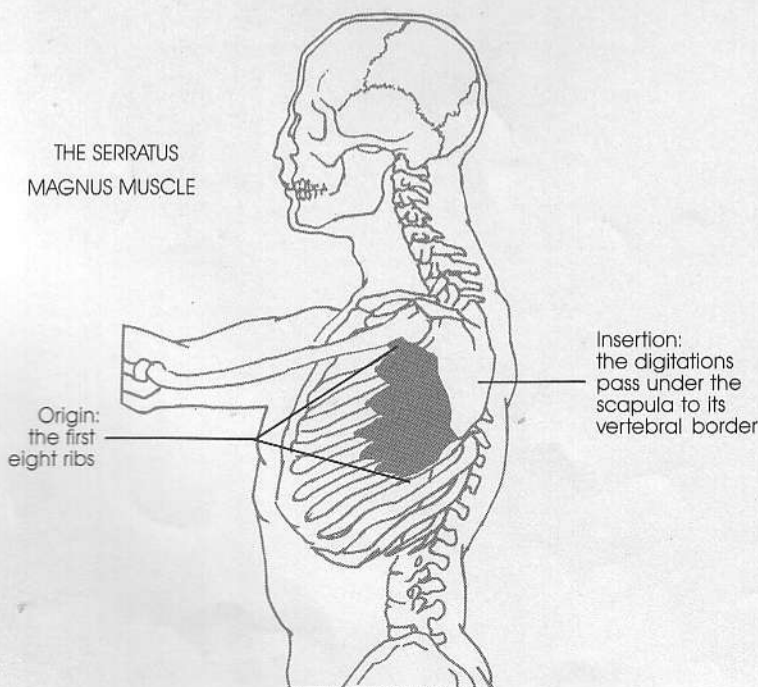


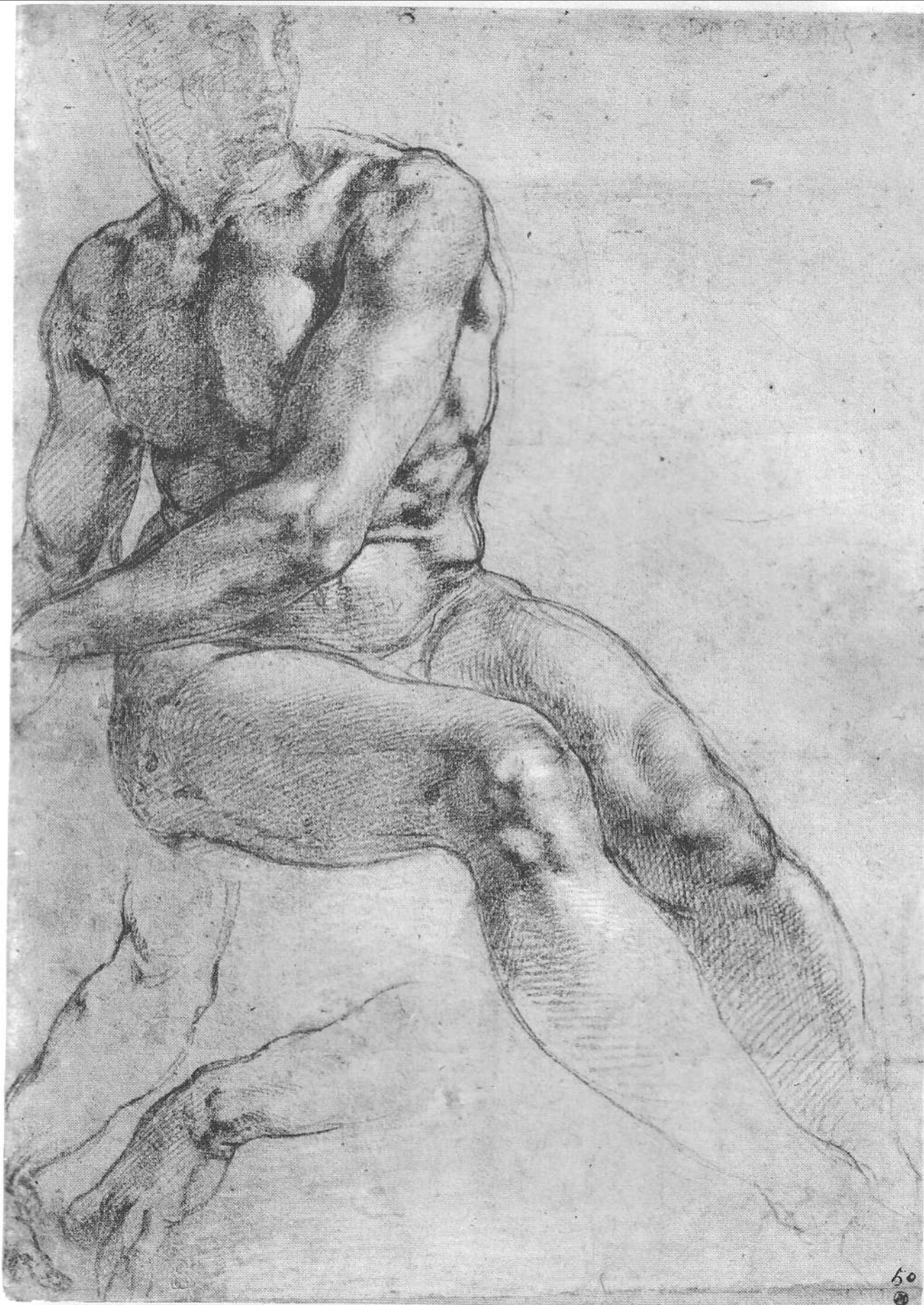
Here is yet another grand drawing of the figure that is unsurpassed in its representation of a solid form in space. Michelangelo wanted the figure's left shoulder and arm to advance and the right knee to advance. To pull some forms of the body forward while pushing others back, the artist first correctly draws the forms in space. Here he drew the rib cage mass as a rounded block, which tilts forward at the top and back at the bottom. The left arm is a blocklike cylinder; the lower end protrudes farther forward than does the top. Next, the artist finds it helpful to analyze the overlapping of forms. If you look at the figure's left shoulder, you can see that the deltoid muscle (A) and upper arm are clearly positioned in front of the left pectoralis major muscle and clavicle; the pectoral and clavicle are in front of the groove of the sternum and the cylinder-shaped neck. These forms lie in front of the figure's right pectoral, which is in front of his right arm. This illusion is accomplished by overlapping lines that echo overlapping forms of the body.

Notice too that on those areas of the body that project forward there are strong value contrasts. The other forms in the drawing are also rendered in light and shade, but the contrast is not nearly so strong as on the projecting forms.

It is interesting to notice how Michelangelo has changed the shape of the pectoralis major muscle (B) from that in the preceding drawing. In that work this muscle appears as a flat, blocklike mass; in this drawing it is spherical. The action or function of this muscle is to draw the arm to the front of the body.

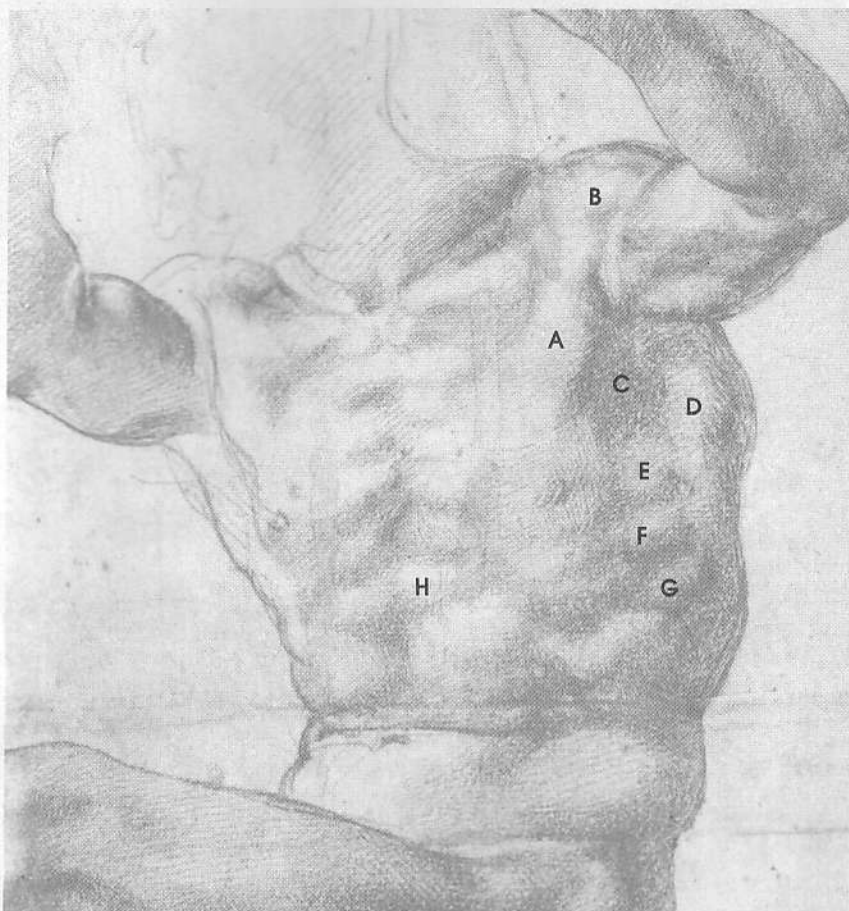
The serratus magnus muscle is made up of nine fingerlike digitations that are located on the sides of the rib cage but are largely hidden by the pectoralis major. The digitations originate from the upper eight ribs, and extend toward the back of the rib cage, where they converge and pass under the scapula to terminate at its inner border. The two serratus magnus muscles pull the two scapulae apart or toward the front of the torso. The upper six digitations are covered by the pectoralis major; the lower three are visible on the surface of the body at C between pectoralis major and a large back muscle called the latissimus dorsi (D), a small part of which is visible in this pose. The digitations are sometimes confused with the ribs, but ribs are parallel to one another, whereas this muscle fans out on the sides of the rib cage resting on top of the ribs.





STUDY FOR THE NUDE AT LEFT ABOVE PERSIAN SIBYL, red and white chalk 10 $\frac{5}{8}$ " \times 7 $\frac{1}{2}$ " (26.99 \times 19.05 cm)

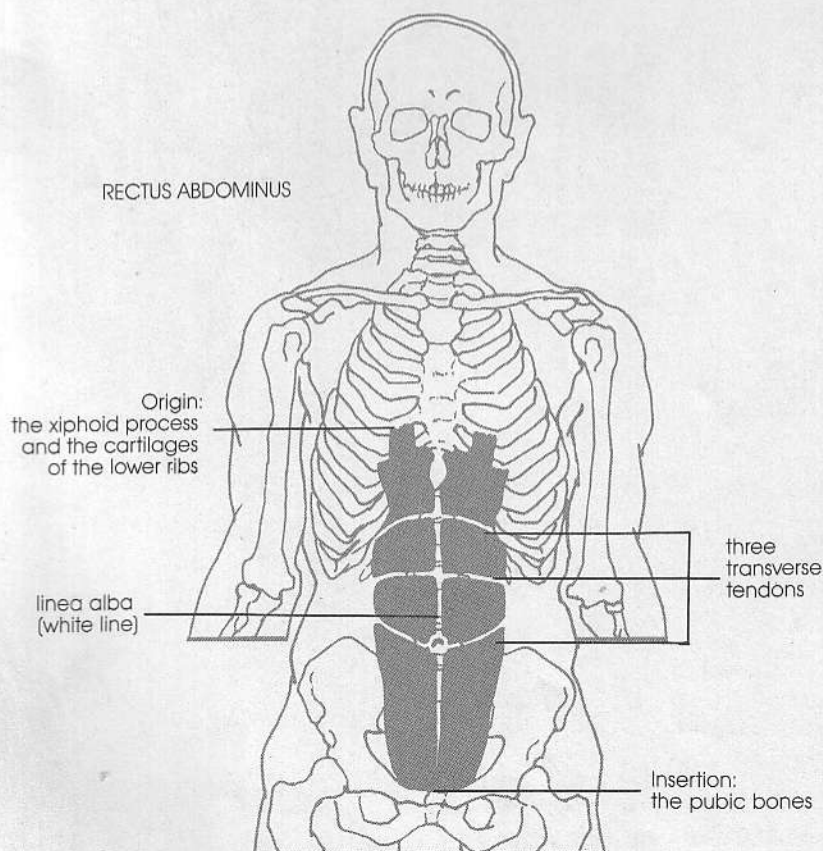
The Rectus Abdominus Muscle



When the arm is raised, the pectoralis major muscle (A) takes on a triangular shape. The fibers of the muscle extend from the rib cage and insert into the upper arm under the deltoid muscle (B). The mass of the pectoralis major also constitutes the front flap of the hollow of the armpit, or axilla (C). The teres major, a small muscle on the scapula, together with a small portion of the latissimus dorsi, forms a mass (D), which makes up the back flap of the axilla hollow. The last three digitations (E, F, G) of the serratus magnus muscle are elegantly drawn. Their position between the pectoralis major and latissimus dorsi muscles is clearly visible.

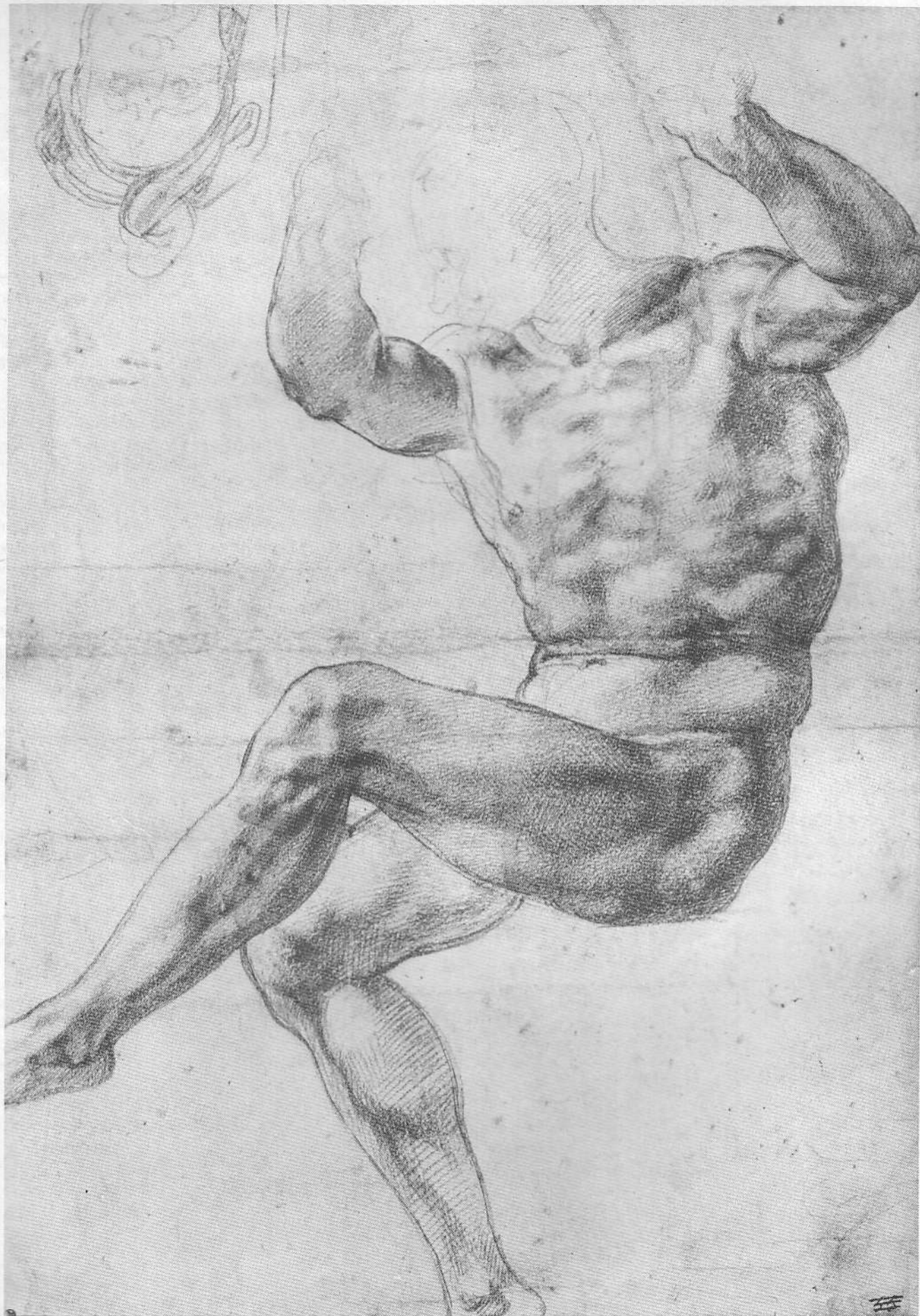
The pectoral region of the torso is separated from the abdominal region by the thoracic arch of the rib cage. This is a large pointed arch formed by the cartilages of the ribs located below the sternum. The abdominal muscle, or rectus abdominis (H), fills this arch and extends from the lower ribs and the xiphoid process of the sternum to the pubic bones of the pelvis, narrowing as it descends.

The linea alba ("white line") is a strong tendon that extends down the center of the rectus abdominis, dividing this muscle in half vertically. The muscle is further divided by three horizontal, or transverse, tendons. One tendon crosses the abdomen at the level of the navel; another intersects the bottom of the rib cage; and the third occurs between the bottom of the sternum and the bottom of the rib cage. If the muscle is well developed, as it is in this drawing, the individual sections of the muscle are visible. Except for a small triangular-shaped muscle, pyramidalis, which is located above the pubic bones, rectus abdominis is the only muscle on the front of the abdominal region. Pyramidalis is covered by fatty tissue, which protects the pubic bones. The rectus abdominis works against the strong muscles of the back to hold the rib cage in an upright position, counteracting the force of gravity. This muscle causes the torso to bend forward; it also forms the wall on the front of the pelvic basin, which protects the organs of digestion. Each individual section of the rectus abdominis muscle is like a portion of an egg in shape and can be similarly shaded. In this pose the rib cage is tilted forward as the pelvic mass is pitched back; the abdominal muscle is folded on itself at a level just above the navel.

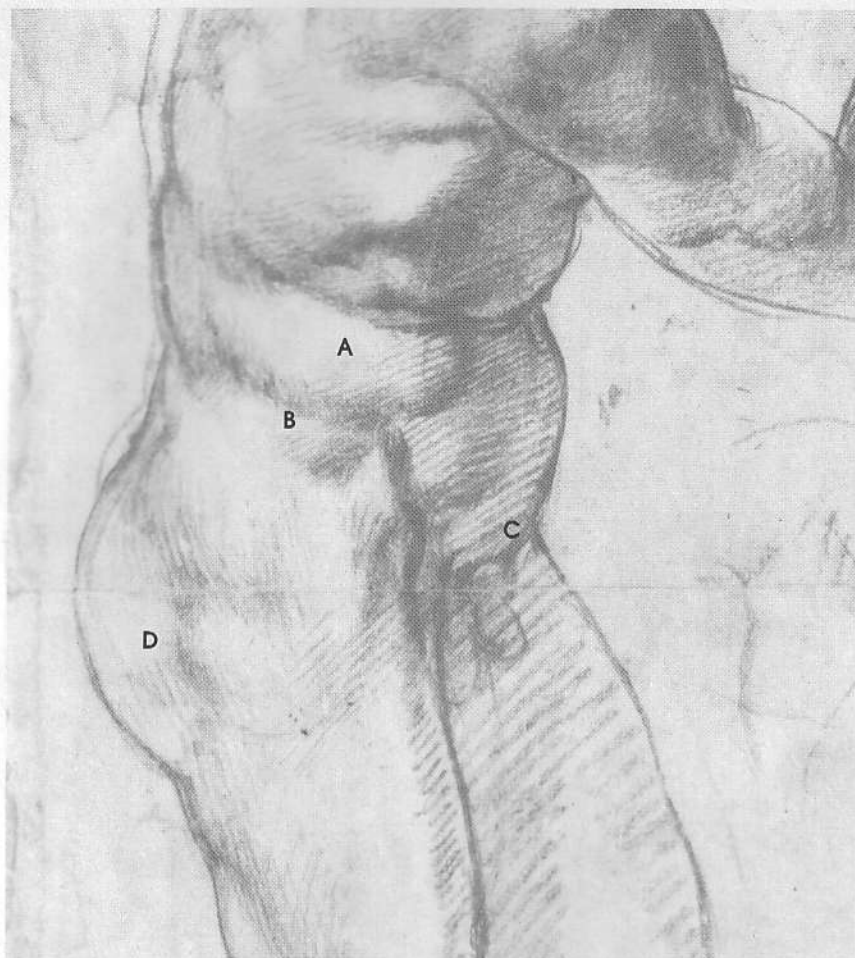


STUDY FOR THE NUDE YOUTH
 OVER THE PROPHET DANIEL

1511, red chalk over black chalk preparations
 13 1/4" x 9 3/8" (33.66 x 23.81 cm) Damaged



The External Oblique



This is a most interesting drawing of the figure in which you can observe a rib cage that is distinctly tipped to one side. The fleshy mass of the external oblique muscle, or obliquus externus abdominus (A), extends from the last eight ribs of the rib cage and inserts into the top of the pelvis, or iliac crest. The shape of the external oblique looks like a teardrop from many angles. In this pose, however, the external oblique appears as a rounded block. When the two oblique muscles simultaneously contract, they work in concert with the rectus abdominis to bend the body forward. When only one contracts, the rib cage is rotated, or pulled, to one side. These muscles also prevent a sideways collapse of the rib cage. The pelvic mass is bound by the iliac crest (B), by the abdomen (C), which slopes downward between the thighs, and by the buttocks (D).

The artist ought to know, not only the forms of the body, the muscles on the surface, but also the changes in the shapes of these forms in the different movements. A muscle may become thicker and shorter in a state of contraction, or it may be relaxed and relatively flattened. Observation as well as understanding the action or function of a muscle will enable you to draw the forms with truth. It is offensive to see a drawing of a figure in great action while all the muscles are portrayed as in a relaxed state, or a reclining figure with all the forms contracted and bulging in an outlandish manner. The ancient Greek artists, observing the nude athletes at the gymnasium, became masters at portraying the exact anatomy of the body in movement.

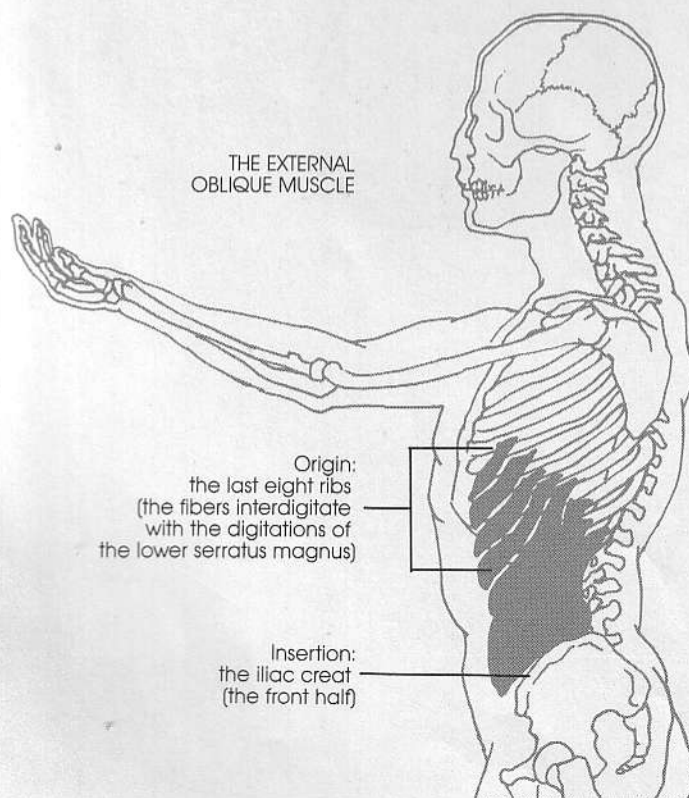


FIGURE STUDY FOR THE
 BATTLE OF ÇASCINA
 1504, black chalk
 16" x 10 1/4" (40.64 x 26.04 cm)



The Fold of the Groin

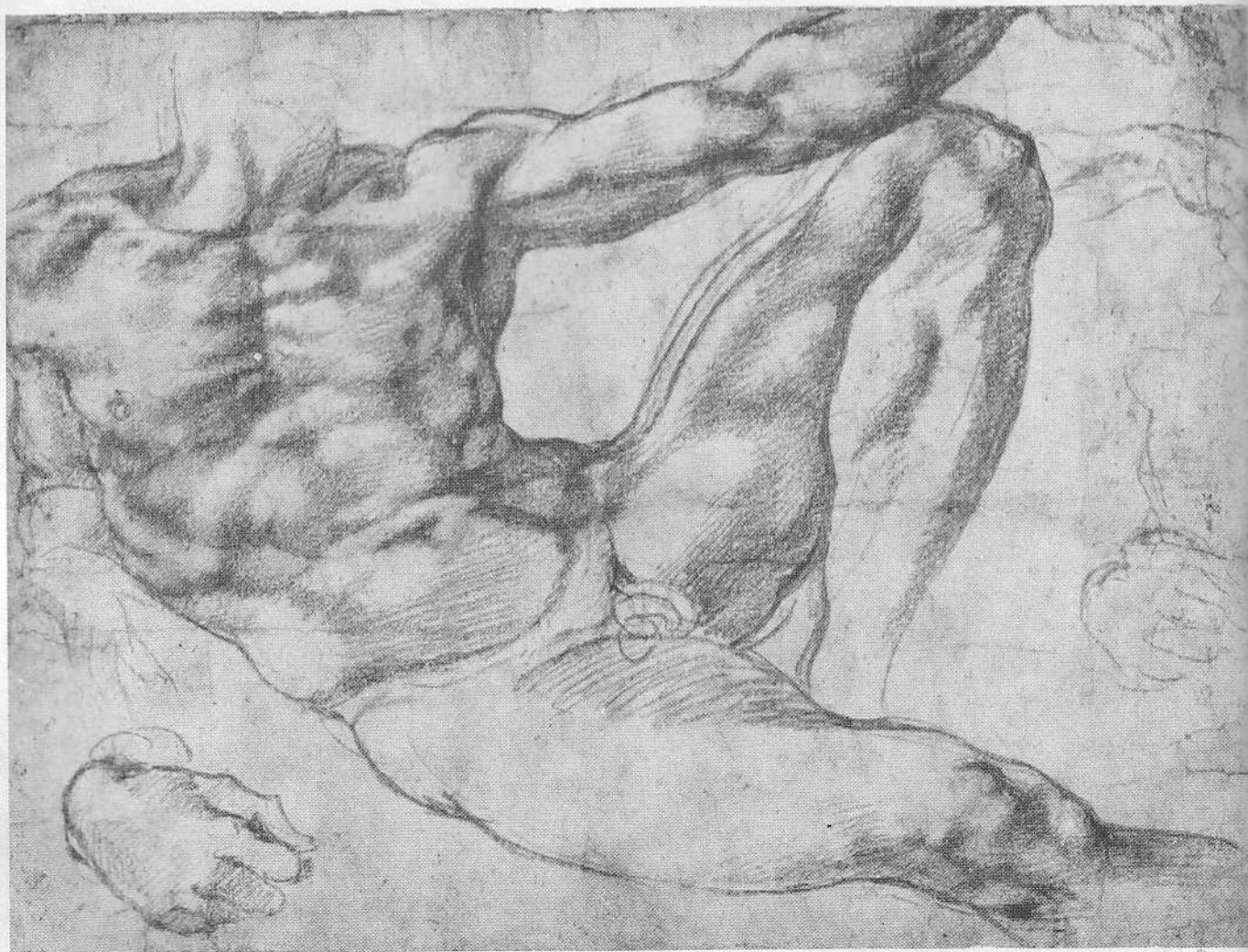
In this mighty drawing of Adam, note the teardrop shape of the external oblique muscle (A). The bottom of the rib cage, from which it extends, is clearly indicated here at B.

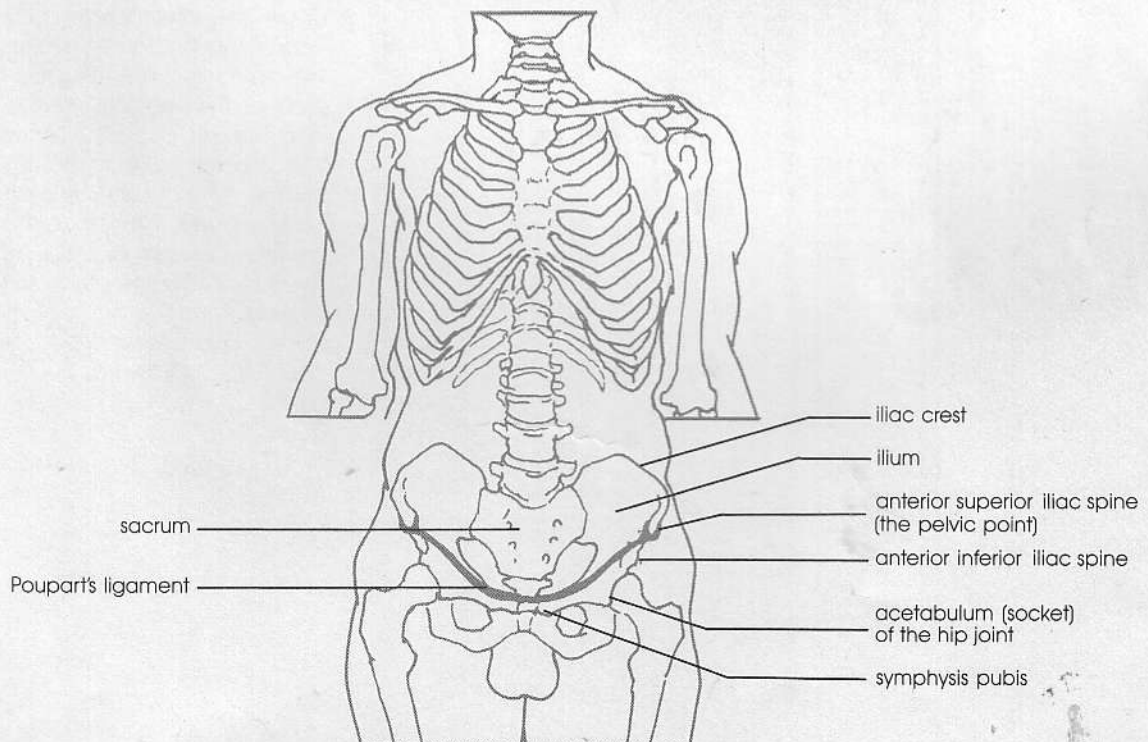
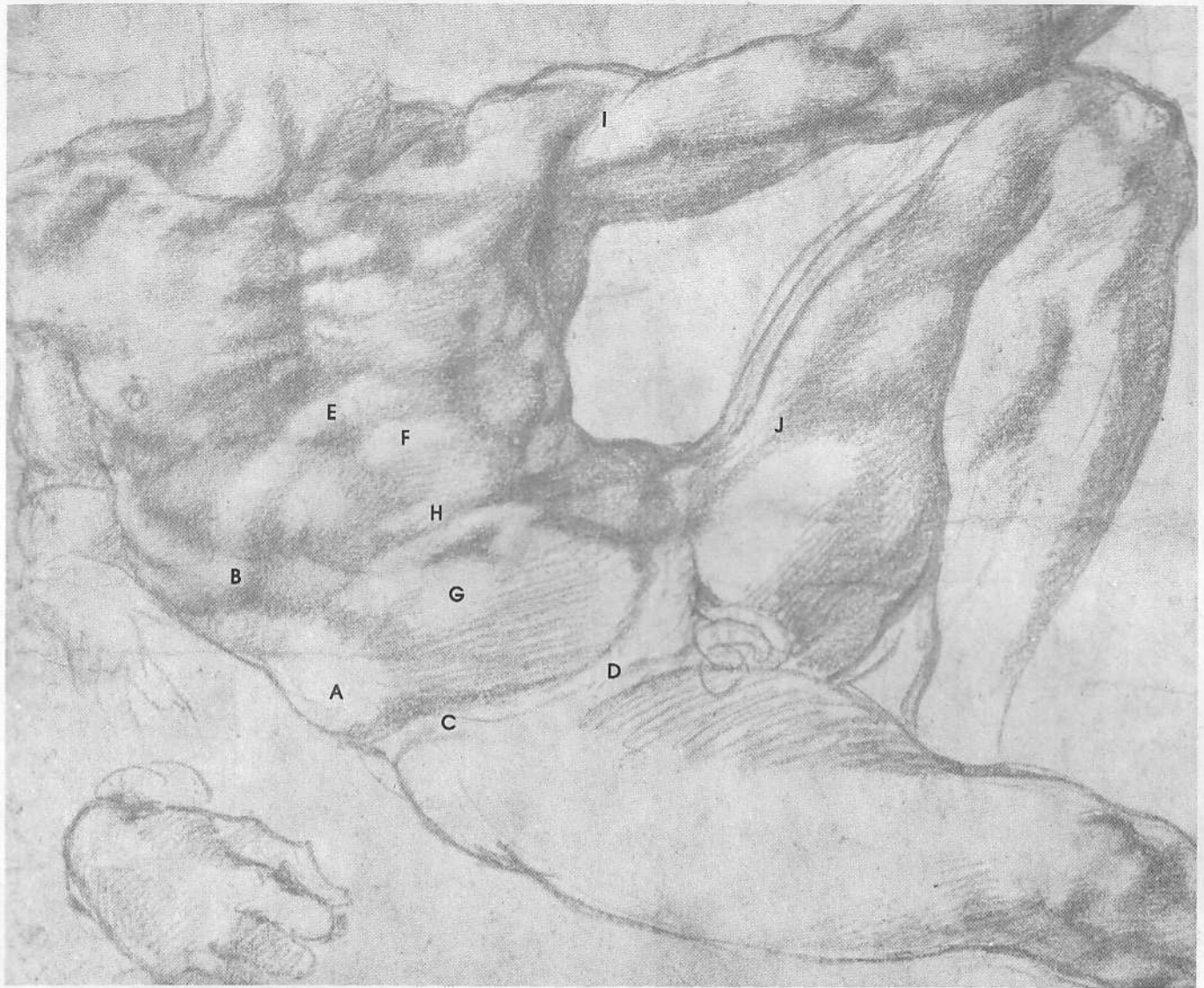
The lower border of the external oblique rests on the front half of the iliac crest. The iliac crest extends from the sacrum, a bony structure at the posterior part of the pelvis, to the front of the body, where it terminates in a small projection of bone called the pelvic point, or anterior superior iliac spine, which is a famous bony landmark located under the skin at C. From the left side of the pelvis, Poupart's ligament extends from the pelvic point down to the meeting place of the two pubic bones, the symphysis pubis, and then back up to the pelvic point on the right of the body. The curved line at D represents the fold of the groin, which is caused by the skin's attachment to Poupart's ligament. This ligament also represents the lower border of the abdominal muscle and separates the trunk of the body from the thigh.

The thoracic arch of the rib cage is indicated with a delicate curved line extending upward from the bottom of the right side of the rib cage (B) to the bottom of the sternum (E) and down again to the bottom of the left side of the rib cage. The rectus abdominis muscle, which fills the thoracic arch, divides the torso of this figure into two major planes, (F and G); a line, H, just above the navel represents this separation.

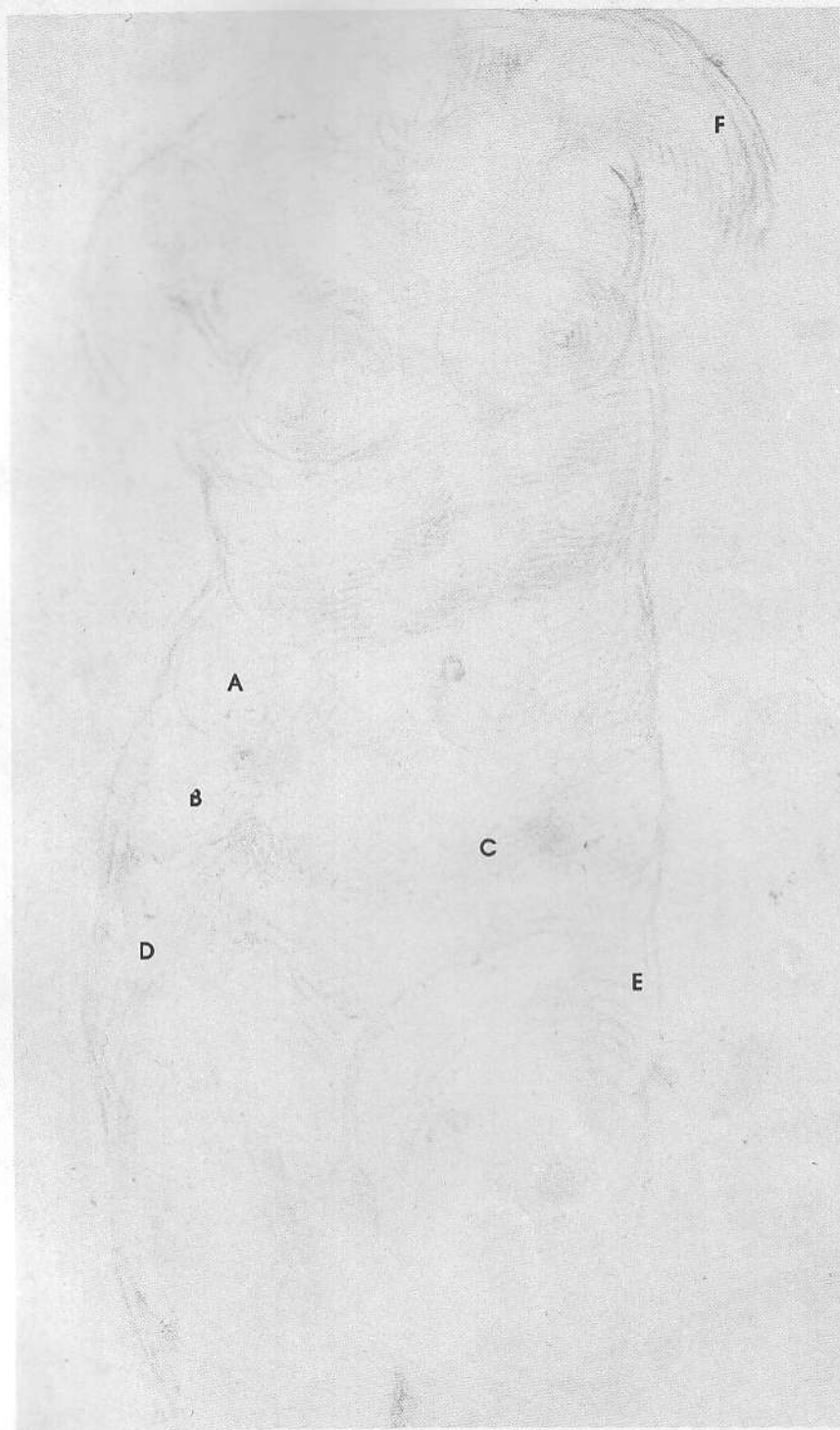
There are many fascinating lines in this drawing. One of the many functions of line is to show where one plane meets another. A beautiful line, which curves downward and passes through the lower border of the deltoid muscle (I), through the figure's left nipple, through the left side of the rectus abdominis, and then sweeps upward onto the thigh (J), separates the front plane of the chest, the lower rib cage, and the pelvic mass from the side planes of these portions of the body. This line also defines the forms over which it passes and establishes the action of the figure.

STUDIES FOR ADAM
IN THE CREATION OF ADAM
1511, red chalk
7 $\frac{5}{8}$ " x 14 $\frac{1}{8}$ " (19.37 x 35.88 cm)





Variations of Form: Male and Female



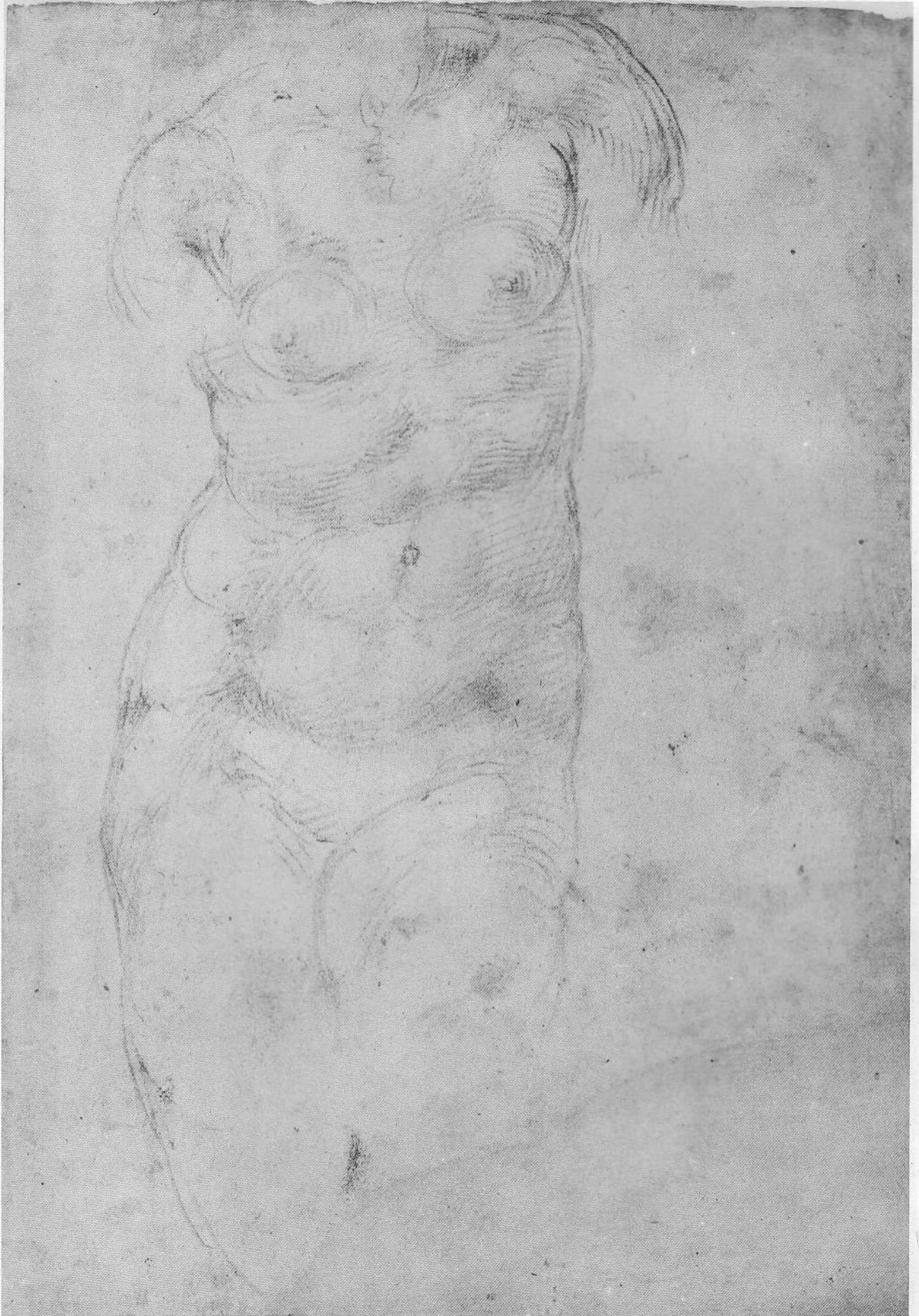
This is a line drawing of the female torso on which the basic forms of the figure have been carefully indicated. Figures are always more interesting when the masses of the body are arranged in opposing directions. In this drawing the model's weight is on her right leg. Therefore the pelvis is pushed upward on the right side of her body. The rib cage, which tilts downward and toward the right side of the body, counterbalances the tilt of the pelvis. The rib cage is also turned slightly toward the model's left side, whereas the pelvic area faces forward toward the viewer.

The mass (A) represents the external oblique muscle. It is only slightly separated from the mass below it, the gluteus medius muscle (B), because these two forms appear as one large mass on many female models. In general, the muscles of the abdominal region of the female figure are much more subtle and less distinguished from one another than are corresponding muscles of the male figure. The line representing the fold of the groin (C) is not as clearly defined as it would be in a male figure. The forms at D and E do not represent muscle; they are caused by the fatty tissue of the thighs.

The shape of the deltoid muscle (F) is different in men than in women. Men's shoulders are broader and more blocklike in shape, whereas a woman's deltoid is spherical at the top; fibers slope gradually downward creating increasing fullness at the bottom of the muscle.

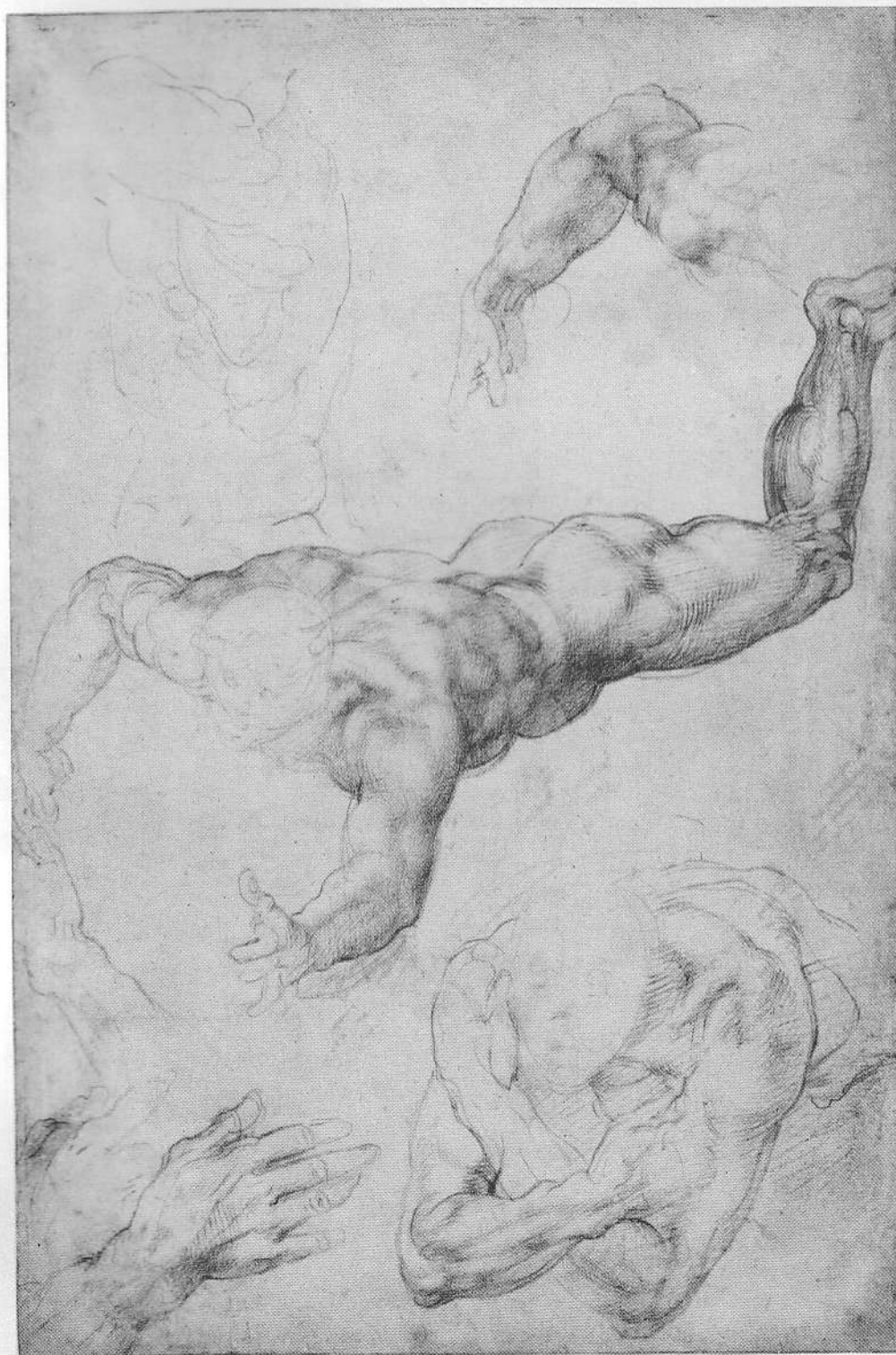
In drawings of male figures, the nipple is just above the lower border and slightly to the side of the pectoral muscle. In drawings of female figures, however, the breasts rest directly on the pectoral muscles, on the middle third of the rib cage; the rib cage area above the breasts is equal to the rib cage area below them. Of course these are classical proportions, and every model is different, but generally breasts are placed closer to the head and shoulders than to the abdomen. Viewed from the front, nipples appear to point outward toward the sides of the body, never straight forward.

STUDY OF CLASSICAL FEMALE,
TORSO ANTERIOR,
1520-21, black chalk
10 1/8" x 7 1/8" (25.72 x 18.10 cm)



CHAPTER FOUR

THE TORSO: POSTERIOR REGION



STUDIES FOR AN ANGEL
AND FOR THE DAMNED
1534-35, black chalk
15 3/4" x 10 5/8" (40.01 x 26.99 cm)

Simplifying the Forms of the Back



As has been shown, Michelangelo had an extraordinary ability to see complex forms of the body in terms of very simple masses. Note the two large egglike masses that are created by the rib cage. The head of the flying figure is merely indicated at this stage of the drawing. Michelangelo obviously wanted to establish the symmetry and mass of the torso without the interruption of the smaller form of the head. The muscles around the back and side of the rib cage are also drawn as small, egglike shapes, which are partially embedded in a larger mass.

The subtle figure at the upper left corner of this drawing suggests a torso seen from the side. The outer line (A) represents the large, dominant mass of the rib cage. The definitive lines and tones of the finished drawing are absent here, allowing you to observe the important initial lines of a master drawing.

Do you think Michelangelo asked the

model to take this unusual pose so that he could carefully copy it? It is unlikely. He had an extensive understanding of the forms of the body that allowed him to draw the human figure from out of his head, without a model, in any position in space that he wished. Drawing from life is very important, a great test of an artist's ability, but it is not the only exercise necessary in learning how to draw the figure.

Figure drawing is not copying from a model. Study the muscles so that you know where each one comes from, and where it goes to, as well as its action. We are able to draw lines only by knowing the origin and insertion of the forms. Drawing of the forms of the body can come only from one who has a complete understanding of construction and anatomy. Practice drawing the figure from out of your head, without a model. This is an excellent way to see if you really know the figure.

Deep Muscles of the Back



Drawing the back is a great challenge because three layers of muscles influence its appearance. The deepest layer consists of the erector spinae muscles, which originate at the sacrum and the back of the pelvis, or ilium, extend up the backbone, to insert into the lower vertebrae of the neck region. Erector spinae muscles bulge on either side of the vertebral spines causing a furrow (A) down the middle of the back, and extend outward to the area at which the ribs turn and bend toward the anterior of the body.

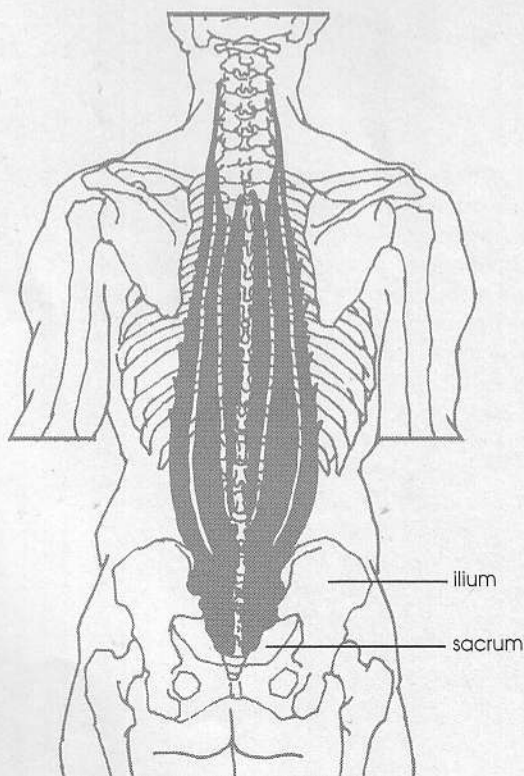
Erector spinae are thickest in the area of the lower back, or lumbar region (B). They are consequently most visible there, where they create two cylinderlike masses on the surface of the body. They appear rather flat in the rib cage area because they don't have much function there. Their function is to extend, or pull backward, the trunk of the body or bring it back after it has been flexed, or bent forward. They also have the important function of helping to keep the whole body in the upright position.

Artists often refer to the deep muscles of the spine as the strong cords of the back because of the cylinderlike masses they make on the surface of the lower back (lumbar) region. Michelangelo liked to play up these muscles in his drawings because of their very human function of holding us in the erect position. When drawing in light and shade, the artist thinks of the values on two great ropes or columns. These masses become very prominent when the model is carrying a heavy object.

THE ERECTOR SPINAE MUSCLES

Origin:
the back of the
ilium and sacrum

Insertion:
fibers pass upward
attaching to the
vertebra and ribs
up to the lower
neck vertebrae



STUDIES FOR ADAM'S
 RIGHT KNEE AND THREE ANGELS
 IN THE CREATION OF ADAM
 1511, red and black chalk
 11 1/8" x 7 3/4" (29.53 x 19.69 cm)



The Scapula and Its Muscles

The rhomboideus muscles, which rest on the deep erector spinae muscles, form two prominent masses (A and B) between the two scapulae. The origin of these muscles is the seventh, or last, neck vertebra and the first five thoracic vertebrae. The fibers of the muscles travel downward and outward to attach to the inner, or vertebral, border of the scapulae (C). The rhomboideus muscles pull the scapulae together, that is, toward the backbone. If a model's shoulders are thus pulled back, the mass of the rhomboideus muscles appears greatly contracted. The rhomboid mass is made up of two sections—rhomboideus minor and rhomboideus major—but the artist thinks of them as one mass.

The scapula has muscles that rest on top of it. It is a flat, triangular bone that is crossed

diagonally in its upper portion by a bony ridge, or spine (D). This bony ridge expands into the acromion process at the summit of the shoulder (E).

The supraspinatus muscle (F) is located above the bony ridge of the scapula and terminates at the back of the upper arm at the humerus under the deltoid muscle. The infraspinatus muscle and teres minor both form a mass (G) located below the bony ridge. They insert into the upper arm beside the supraspinatus. The function of these three muscles is to pull the arms backward and to rotate them outward, away from the front of the body.

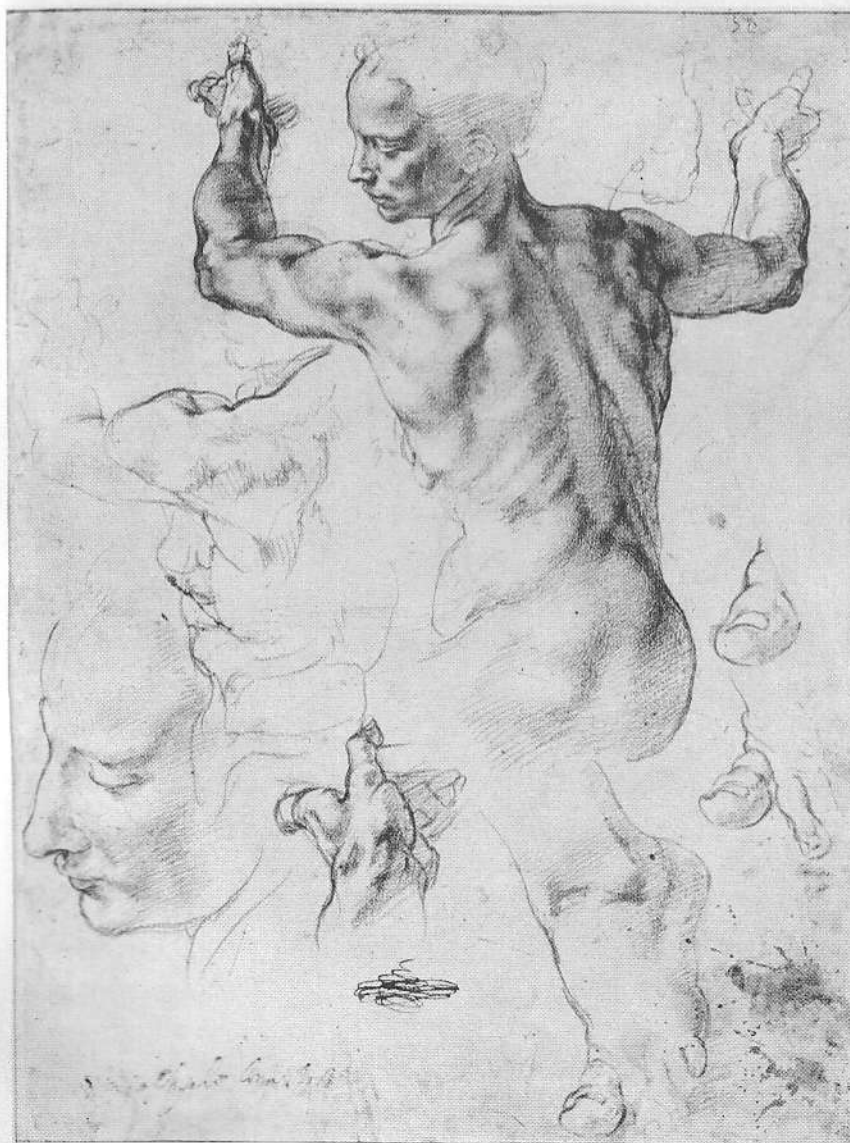
The teres major muscle (H) is located below infraspinatus and teres minor. It originates at the lower portion of the scapula and inserts into the front of the upper arm beneath the deltoid muscle. The teres major works with the teres minor, the infraspinatus, and the supraspinatus to pull the arms back. But it acts alone to rotate the arms inward, toward the front of the body. The teres major and all other forms created by the muscles of the scapula appear as small, egglike shapes, which are partially embedded in the larger mass of the back.

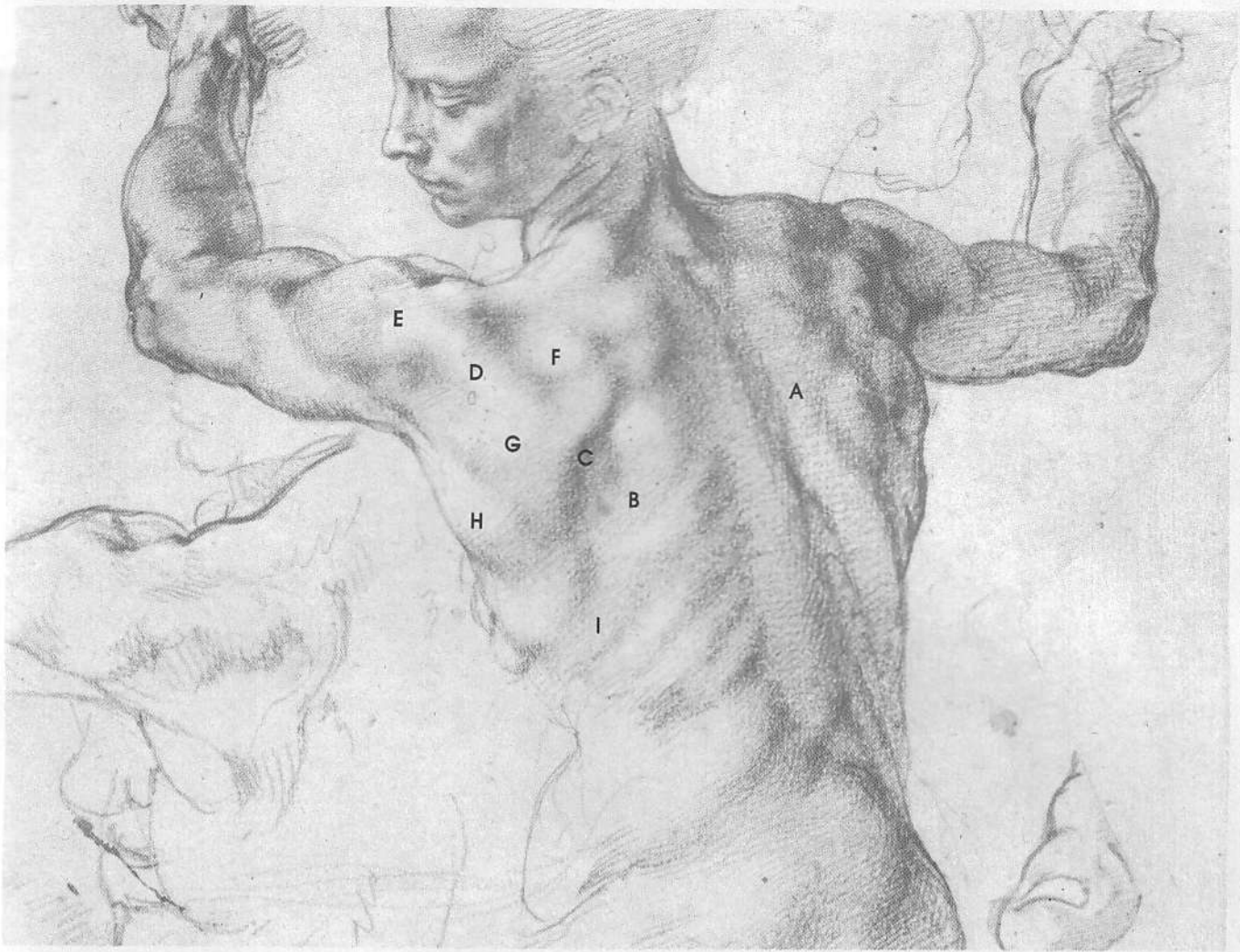
In this drawing the light again comes from above left. If you disregard all the small forms for a moment, you can visualize the entire back as a large flattened oval; there is a clear progression of darkening tone from left to right. The light area (I), the halftone, or gray area, between light and shade and the shadow illustrate this progression. In modeling individual small forms you should keep in mind this movement of light into dark.

It is important not only to know the exact shapes of the scapulae but also precisely how and where to place these bones relative to the rib cage. The scapulae occupy the upper half of the rib cage, and the distance between them is equal to the length of one of them.

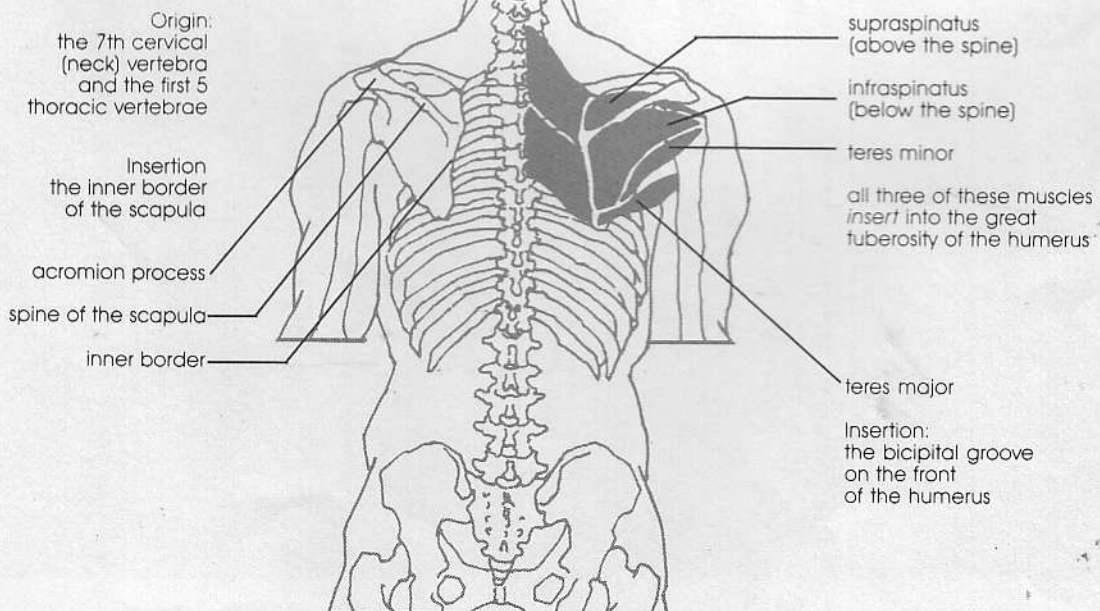
The scapulae are certainly capable of great movement. When the shoulders and arms are thrown forward, the scapulae draw away from each other; when the shoulders are pulled back, the scapulae are drawn toward each other. When the arm is raised higher than the shoulder, the scapula rotates from a vertical to a horizontal position on the rib cage. The key to determining the position of the scapula when drawing a figure with an arm raised above the shoulder is to look at the direction of the arm: the scapula and arm will be at a right angle to each other.

STUDIES FOR THE LIBYAN SIBYL
1511, red chalk
11¼" × 8⅝" (28.58 × 21.27 cm)





THE RHOMBOIDEUS MUSCLE



The Trapezius Muscle

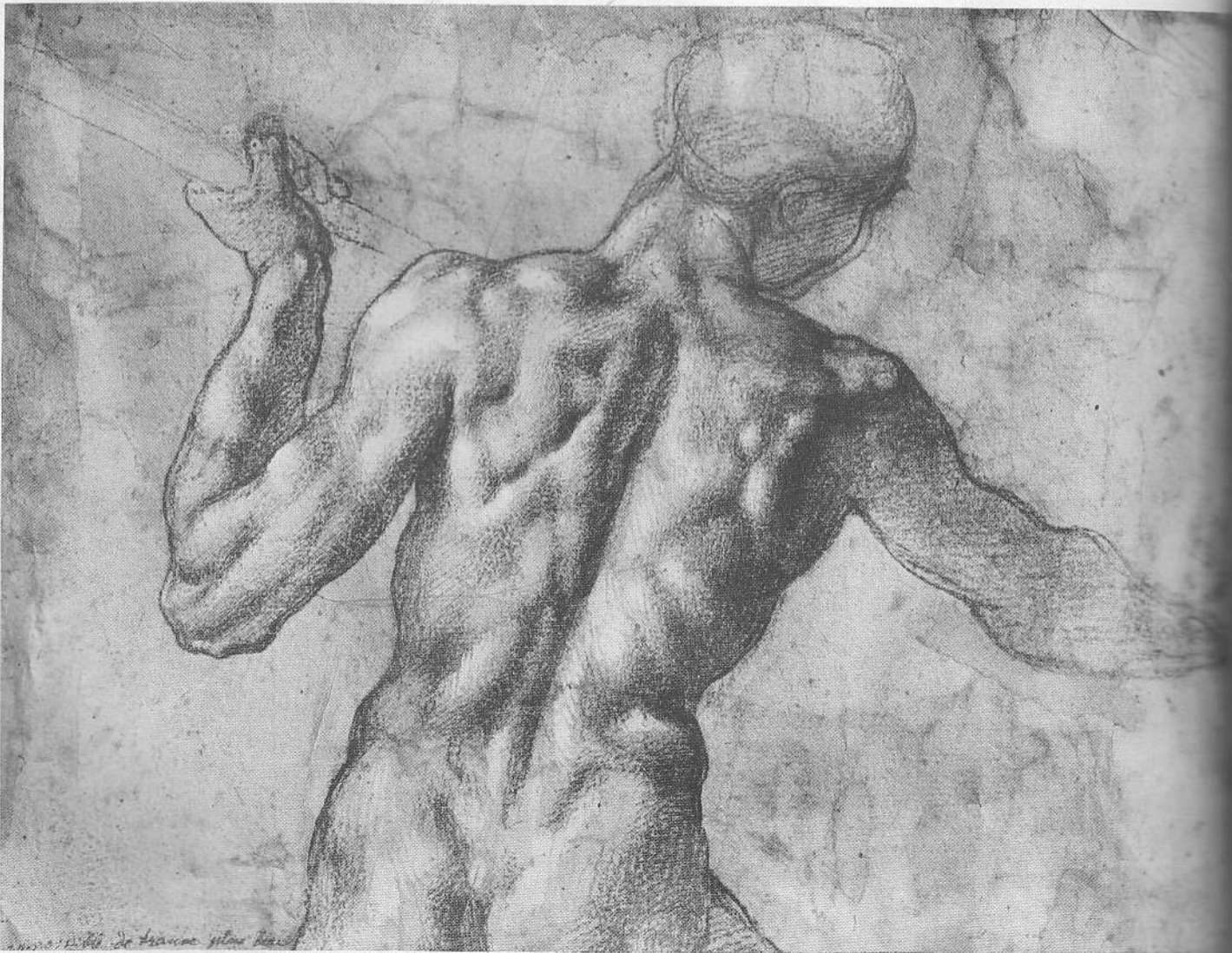
The two halves of the trapezius muscle (A and B) are entirely superficial. This form is located on the back of the neck, shoulder, and upper back region. Its inner border extends from the back of the skull to the last, or twelfth, rib vertebra (C). The trapezius has tendinous sheet areas on it, which appear as slight depressions on the surface of the body. The extent of these depressions depends on the extent of muscular development of the model. One area of tendon sheet is located around the twelfth thoracic vertebra at the tip of the tail of the trapezius muscle (C). Another area is located at the spine of the scapula on the summit of the shoulder (D), and the third area surrounds the prominent seventh cervical vertebra on the back of the neck (E). This last area is diamond-shaped and is formed by the inner margins of the trapezius muscle.

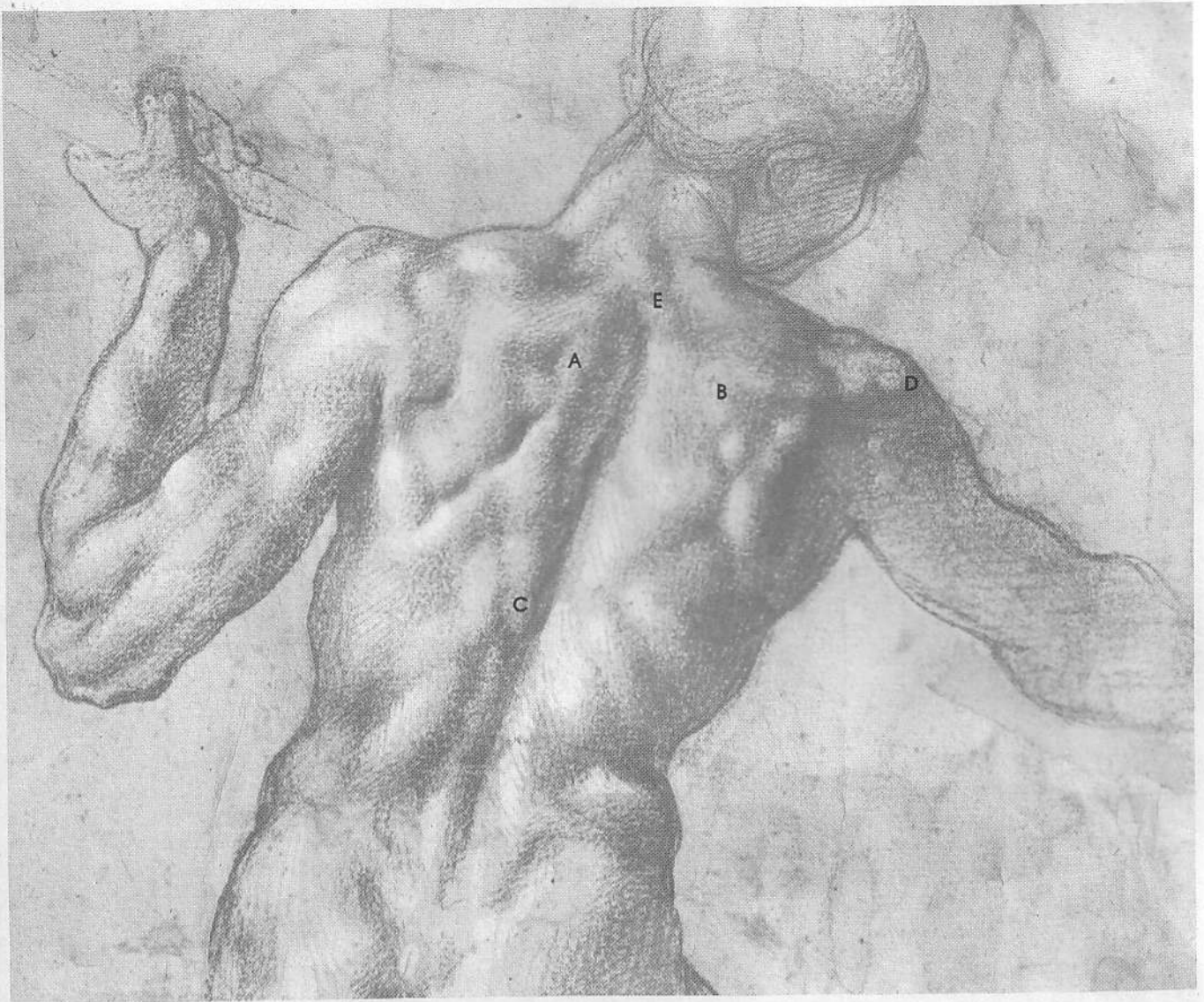
Because the trapezius muscle is large and inserts into several areas of the back, its func-

tions vary, according to the part of the muscle that is activated. If both shoulders are fixed, the fibers located there will pull the head back, but if only one side is activated, the head will be pulled down to that shoulder. The lower fibres of the tail of the trapezius draw the shoulders down; the middle fibres between the scapulae draw the shoulders toward one another. If the head is fixed, the fibers of the trapezius in the neck and shoulder regions raise the shoulders.

To draw the muscles of the back to give the effect of a three-dimensional figure, you need to control the values on the muscles. Decide which forms are in the light, which are in half-tone, and which are in shadow. Sketch in the values of the largest masses first. Then soften the edge between the lit and shaded areas to round out the forms. Only geometric shapes such as a cube have sharp edges where one plane meets another.

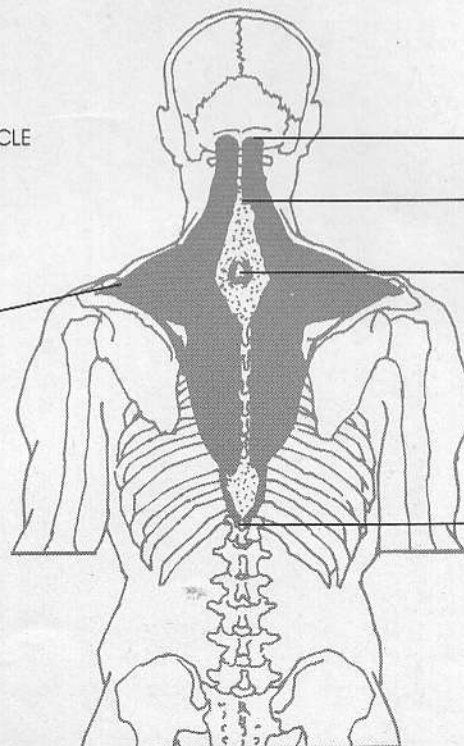
FIGURE STUDIES
FOR BATTLE OF CASCINA
1504, black chalk
7 5/8" x 10 1/2" (19.37 x 26.67 cm)





THE TRAPEZIUS MUSCLE

Insertion:
the outer third
of the clavicle,
the acromion
and the spine
of the scapula
from above



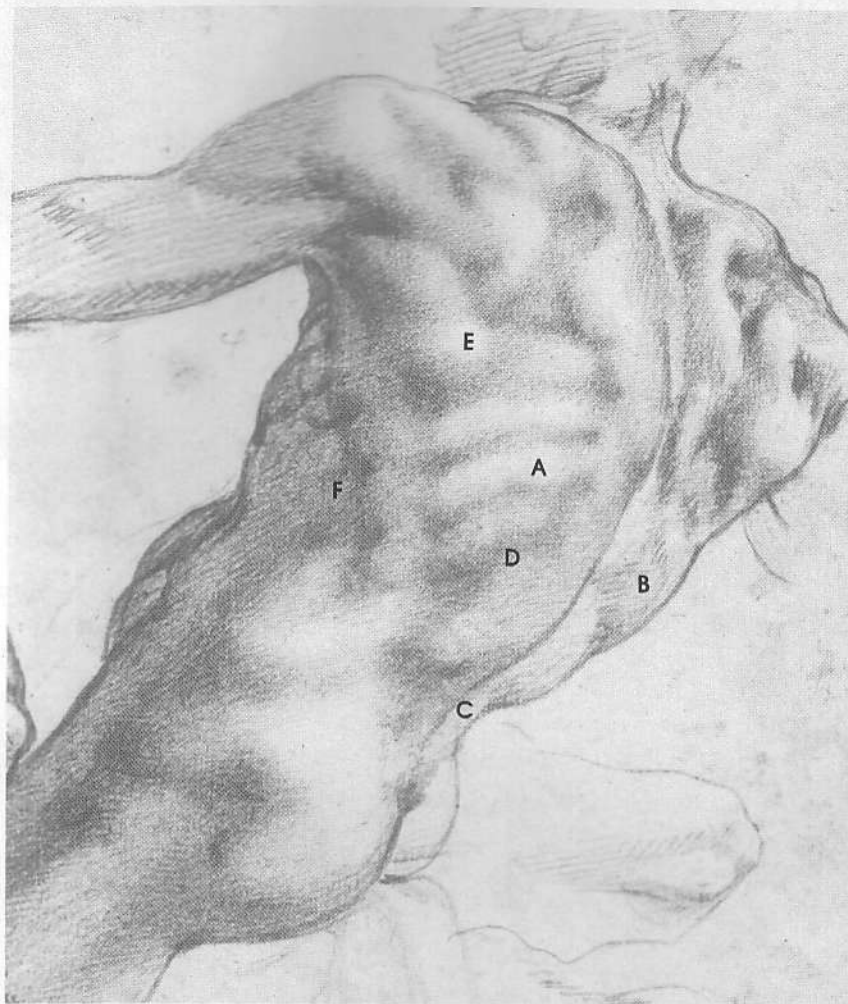
Origin:
the occipital bone
to the 12th rib vertebra

neck ligament

7th cervical
(neck) vertebra

12th rib
vertebra

Latissimus Dorsi



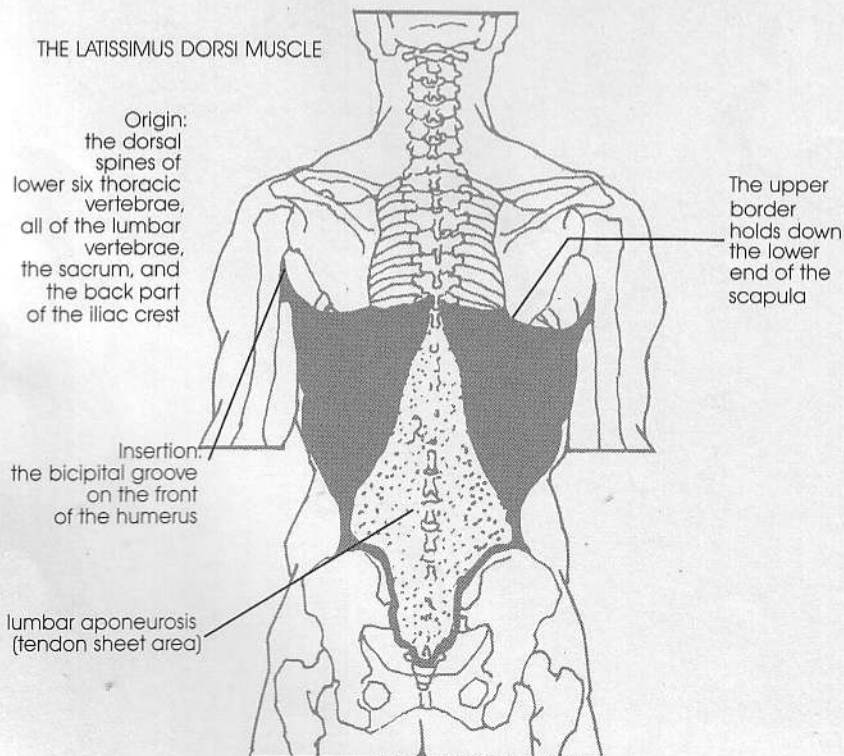
Another superficial muscle of the back is the latissimus dorsi. Along with the back of the shoulders and a small triangular area of the muscles of the scapula region, the forms that make up the surface of the back are: trapezius and the two halves of latissimus dorsi (A and B). This huge, symmetrical muscle originates at the pelvis and sacrum, extends upward over the lumbar region, the lower six pairs of ribs, and the lower portion of the scapula as it extends outward to the armpit. There latissimus dorsi inserts, along with the teres major, into the front of the humerus, just below its head. The lower portion of this muscle, at the sacrum, pelvis, and lower back, is just a thin tendinous sheet. Beneath this thin sheet, the underlying erector spinae muscles (C) show clearly on the surface of the figure in this drawing.

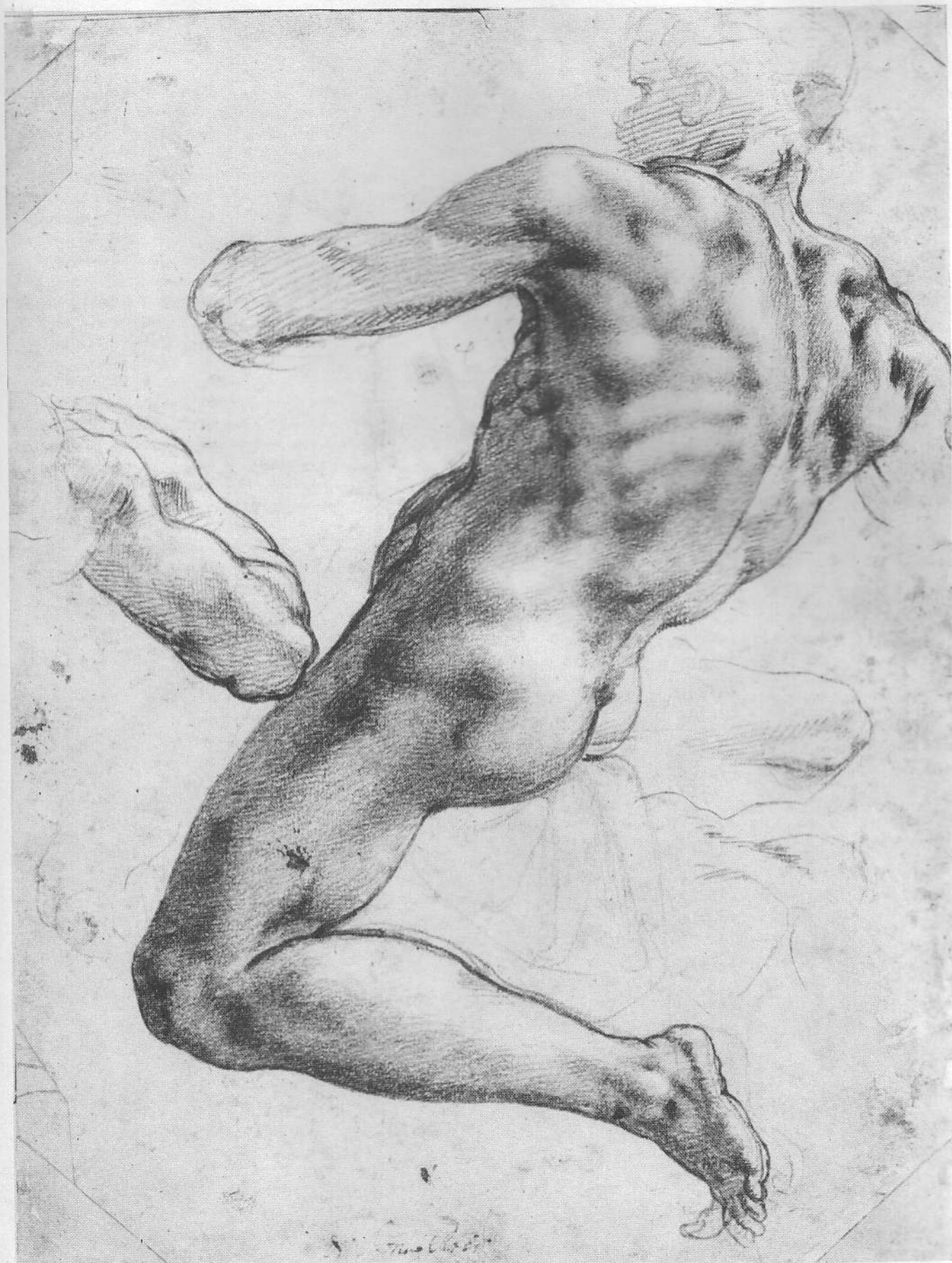
Short, hatched lines (D) indicate where the muscle fibers of latissimus dorsi arise from the tendon sheet in the lower back. These lines extend from the highest point of the pelvis, upward and inward toward the backbone. The upper border of this muscle (E), which runs horizontally over the deeper forms of the back at the level of the sixth rib vertebra of the backbone, passes over the lower portion of the scapula and thus holds it down on the rib cage. The front border of the latissimus dorsi (F) extends downward from the armpit and curves around to the back of the rib cage, creating a beautiful line on the figure.

Latissimus dorsi makes it possible to lower the raised arm and pull it back with force. It shows itself clearly in such movements as playing golf, swimming, chopping wood, or pulling on a rope. It enables the entire body to be pulled upward and forward when the arms are in a fixed position. Actions that particularly depend on this muscle are rope climbing and work on a horizontal bar.

The halves of the latissimus dorsi and the underlying rib cage suggest the shapes of two large watermelons. To place light and shade on such dominant forms in your drawing, it is helpful to visualize, or even to indicate on the paper, an arrow showing the direction from which the light is coming. That will establish the direction of the movement of light to dark across the figure. It will also prevent the light from jumping to hit forms from different directions, thus tending to destroy their unity. In rendering major forms it is also helpful to run a line down the forms to separate the light area from the shadow area. The halftone area falls along that line.

THE LATISSIMUS DORSI MUSCLE





STUDIES FOR NUDE 1511, red and black chalk 11" × 8 7/8" (27.94 × 21.27 cm)

Modeling the Back with Light and Shade

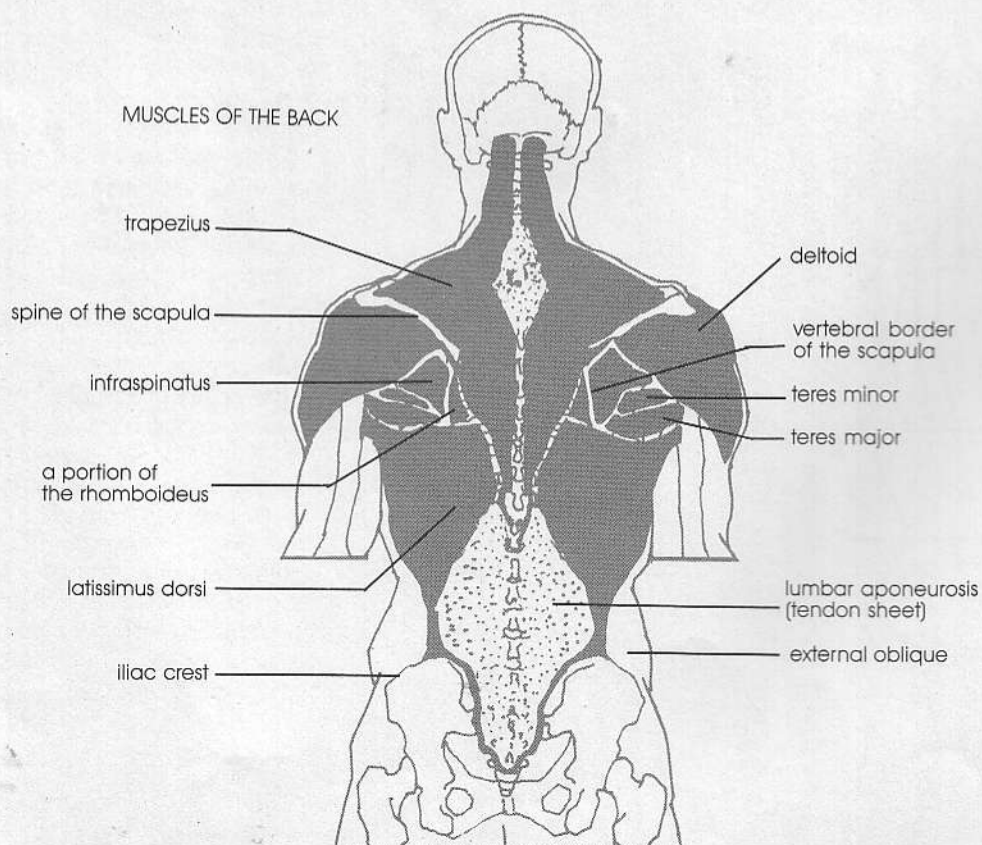
The two large superficial muscles that cover most of the back, latissimus dorsi and trapezius, are relatively thin—rather like a blanket—and are therefore influenced by the forms of the deeper, underlying muscles. In this drawing the mass of the back (A) above the spine of the scapula is formed by the trapezius and the underlying supraspinatus. The two masses between the scapulae (B and C) are formed by the rhomboideus and trapezius muscles. A small mass below the spine of the scapula (D) is caused by the infraspinatus muscle. It is most important to note that the infraspinatus interlocks with, or trespasses onto, the mass of the deltoid muscle (E). The lower end of the scapula and the overlying teres major form a small egg-shaped mass (F). The teres major is located directly on the top border of the latissimus dorsi (G). The great columns of the erector spinae (H) are visible through the tendon

sheet of the latissimus dorsi. The mass between the bottom of the rib cage and the top of the pelvis is represented by the external oblique (I).

As they are shown on anatomical charts, there are no lines on a model's back separating muscle masses. The forms of the back in a finished drawing are depicted by small masses in light and shade, which are partially embedded in the great mass of the back itself. Remember that darks in the light always appear darker than they really are. The same applies for reflected light in shadow—the lights always appear lighter than they are. If you follow a simple rule, the values you use to shade the back will be more dynamic and accurate: When modeling the light areas of your figure, make the darks lighter than they appear to you, and when working in the shadow areas, make the lights darker than they appear to you.

STUDIES FOR THE BACK
AND LEFT ARM OF DAY
1520-21, black chalk
7 3/4" x 10 1/8" (19.69 x 25.72 cm)





The Pelvic Girdle: Balancing the Body



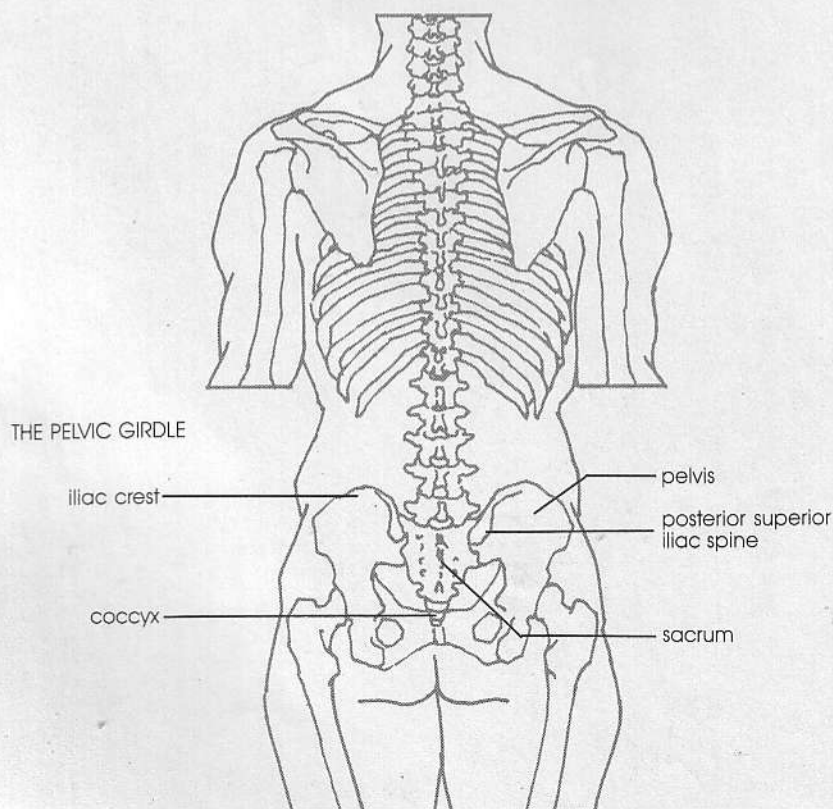
There are two skeletal girdles on the body, the shoulder girdle and the pelvic girdle. The function of the shoulder girdle is mobility. Only slightly attached to the rest of the skeleton, it affords the upper limbs freedom of movement.

The function of the pelvic girdle is stability as well as locomotion of the lower limbs. The two large halves of the pelvis (meaning "basin") are firmly attached in back to the sacrum, and in front the two pubic bones are firmly connected to each other. The pelvis, which rests on top of the heads of the two thighbones, or femurs, holds up the backbone.

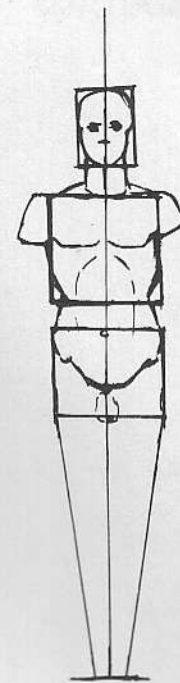
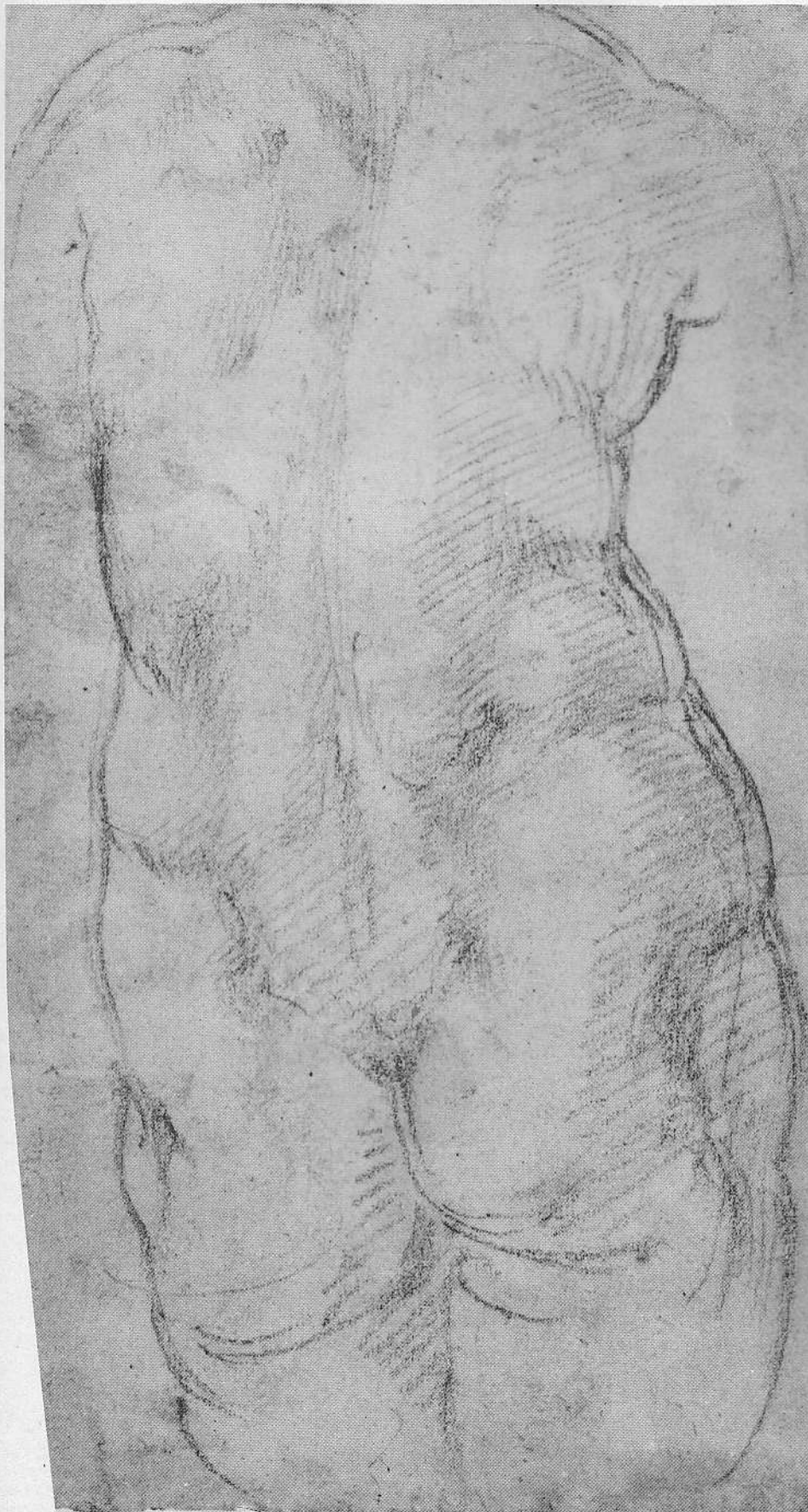
The only parts of the pelvis that are visible on the back are the pelvic, or iliac, crest (A) and the sacrum (B). The os sacrum ("sacred bone"), as it was sometimes called, was the bone offered up to the gods in sacrifice by early man. It is actually five vertebrae that have ossified, or fused together, to form one triangular-shaped bone. The sacrum is not flat but curves outward (convex) from top to bottom. On its base and indicating its width are the posterior pelvic, or iliac, spines (C and D), which appear on the surface of the body as landmark dimples. These landmarks are farther apart on women than on men because the female sacrum and pelvis are wider than those of the male. These two points, together with the point that indicates the bottom of the sacrum (E), form a useful construction triangle for clarifying the position of the pelvis in any given pose. A line running through points (C and D) would indicate the tilt of the pelvis.

Below the sacrum are the four very small bones that represent all that remains of the vertebrae that form the human tail, or coccyx. The coccyx is not really of interest to artists because it curves under and between the two buttocks and does not appear on the surface of the figure.

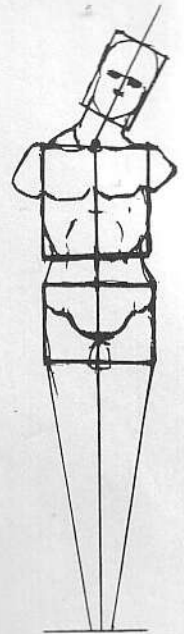
The position of the pelvis determines the overall pose of the figure. If the model is resting her weight on one leg, the right leg in this drawing, the pelvis is pushed up on the right side and drops lower on the opposite side. All the smaller forms must be correspondingly tilted. To maintain the model's balance against the pull of gravity, the shoulders counteract the direction of the pelvis by tilting in the opposite direction; that is, if the pelvis is higher on the right side, the shoulder will be higher on the left side.



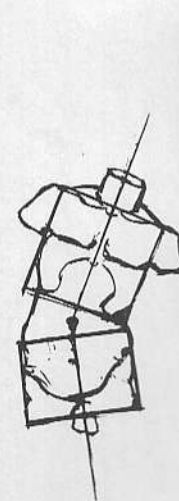
STUDY OF CLASSICAL FEMALE FORM
 1520-21
 10 1/8" x 7 1/2" (25.72 x 19.05 cm)



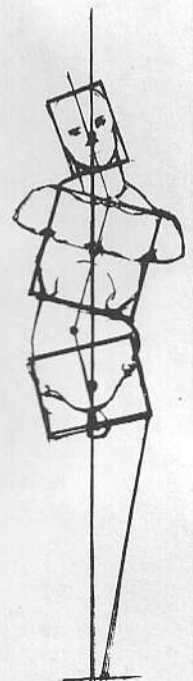
Head, rib cage,
and pelvis,
in perfect
balance



Head tilted:
balance
maintained
because head
is not that
heavy

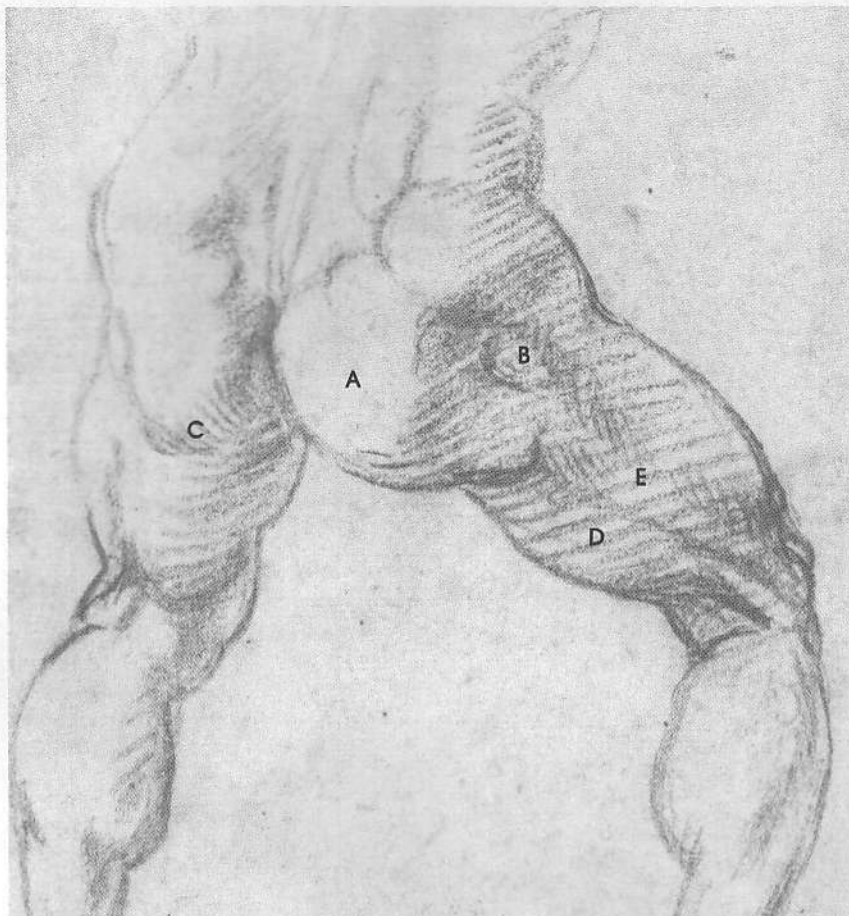


Rib cage and
pelvis tilted:
one to the right;
the other
to the left
to give
balance



Head, rib cage,
and pelvis tilted:
a vertical
line extends
from the pit
of throat
to the foot
of the weight-
bearing leg,
passing
through the
centers
of masses

Gluteus Maximus

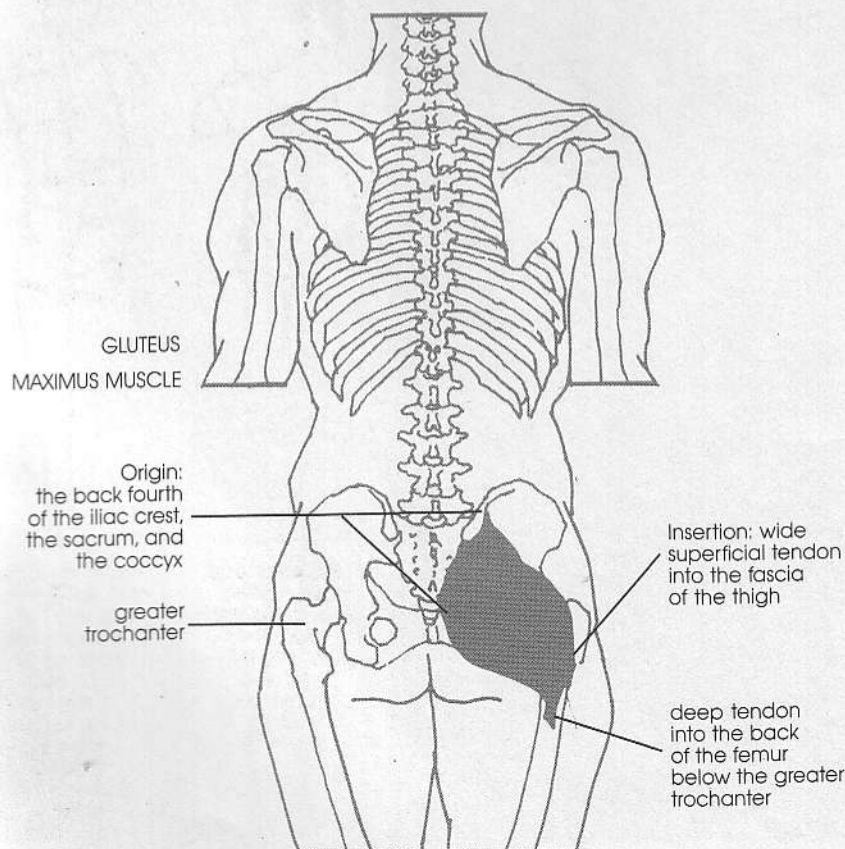


The gluteus maximus (A), the largest and thickest muscle of the body, forms the buttock. It arises from the back fourth of the iliac crest, the sacrum, and the coccyx. Some of its fibers terminate in sheets of fibers, or fascia, on the thigh; others insert into the back of the shaft of the femur just below the greater trochanter (B), a large, square projection of the femur located just below its head and neck. Depending on the contraction or expansion of the gluteal muscles around it, the greater trochanter appears on the surface of the body as a landmark depression or projection. When the model stands perfectly straight with weight equally distributed on both legs, the greater trochanters are level. However, when the weight is placed on one leg, the greater trochanter of the standing leg is thrust out and appears as a projection on the surface. The trochanter of the relaxed leg on the opposite side appears as a depression.

The gluteus maximus is blocklike in shape, but the fat that occurs on its lower border softens the shape there and creates the gluteal fold (C). Notice how Michelangelo has manipulated line in this area of the drawing to indicate the under plane of the gluteus maximus at its juncture with the thigh.

The gluteus maximus extends the flexed, or bent, thigh, that is, pulls it back into line with the trunk. More important, it maintains the body, whose trunk would otherwise fall forward at the hip joint, in an upright position. Long before Darwin's theory of evolution, Aristotle called the gluteus maximus the most distinguishing muscle of man. During the evolutionary process its size increased, and it was ultimately responsible for the rotation of the pelvis from a horizontal to a vertical position.

Here Michelangelo has clearly indicated the fibers of the gluteus maximus inserting between the hamstring mass (D) at the back of the thigh and the vastus extensus muscle (E) on the side.



NUDE
1534 and 1545, black chalk
9 1/2" x 7 1/4" (24.13 x 18.42 cm)
Damaged



The Torso in Profile

Some of the forms that have been discussed as seen from the front and back may also be examined as they appear from the side.

In profile, such muscles as the rectus abdominis (A) have to be thought of as forms

that are receding into space. Imagine what happens if you turn the front side of a cube toward the left or right. The changes in its shape are consistent with the change in appearance of the rectus abdominis as the body turns from front view to profile.

The large mass of the latissimus dorsi (B) and the line indicating its rather thick front border (C) are more clearly visible in profile than in front view.

In profile the mass of the external oblique muscle (D), which fills the space between the rib cage and the pelvis, appears as a rounded, blocklike form that rests on the iliac crest. When the body is viewed from front or back, this muscle resembles the shape of a teardrop.

A second muscle of the pelvis, the gluteus medius, is located just above the gluteus maximus and rests on the sides and back of the pelvis. It arises from the front three-fourths of the iliac crest (E) and the area below, to insert into the top of the greater trochanter (F). When seen from the front, this muscle appears as a small, subtle, rounded mass. In profile you can observe its large spherical shape (G) to a fuller extent than is possible from the front. Its function is to grab hold of the greater trochanter and pull the thigh out away from the body.

Notice the double, curved line (H) that expresses the separation between the gluteus medius and the gluteus maximus. In a back view this separation is always more visible on the leg that bears the weight of the body than on the leg of the relaxed side of the body. On a side view of the figure this separation is most visible.

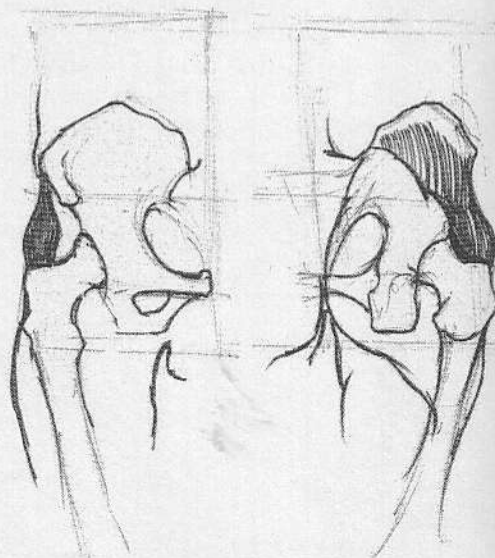


GLUTEUS MEDIUS MUSCLE

Origin:
the ilium
(the area below
the iliac crest)

Iliac crest

Insertion:
the greater
trochanter
of the femur



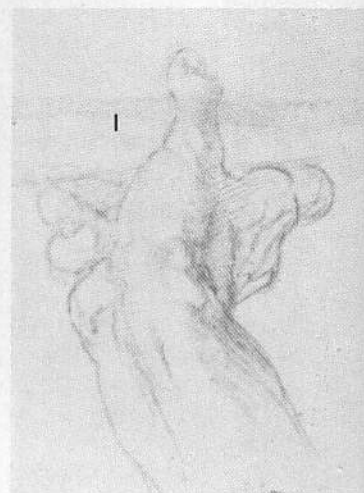
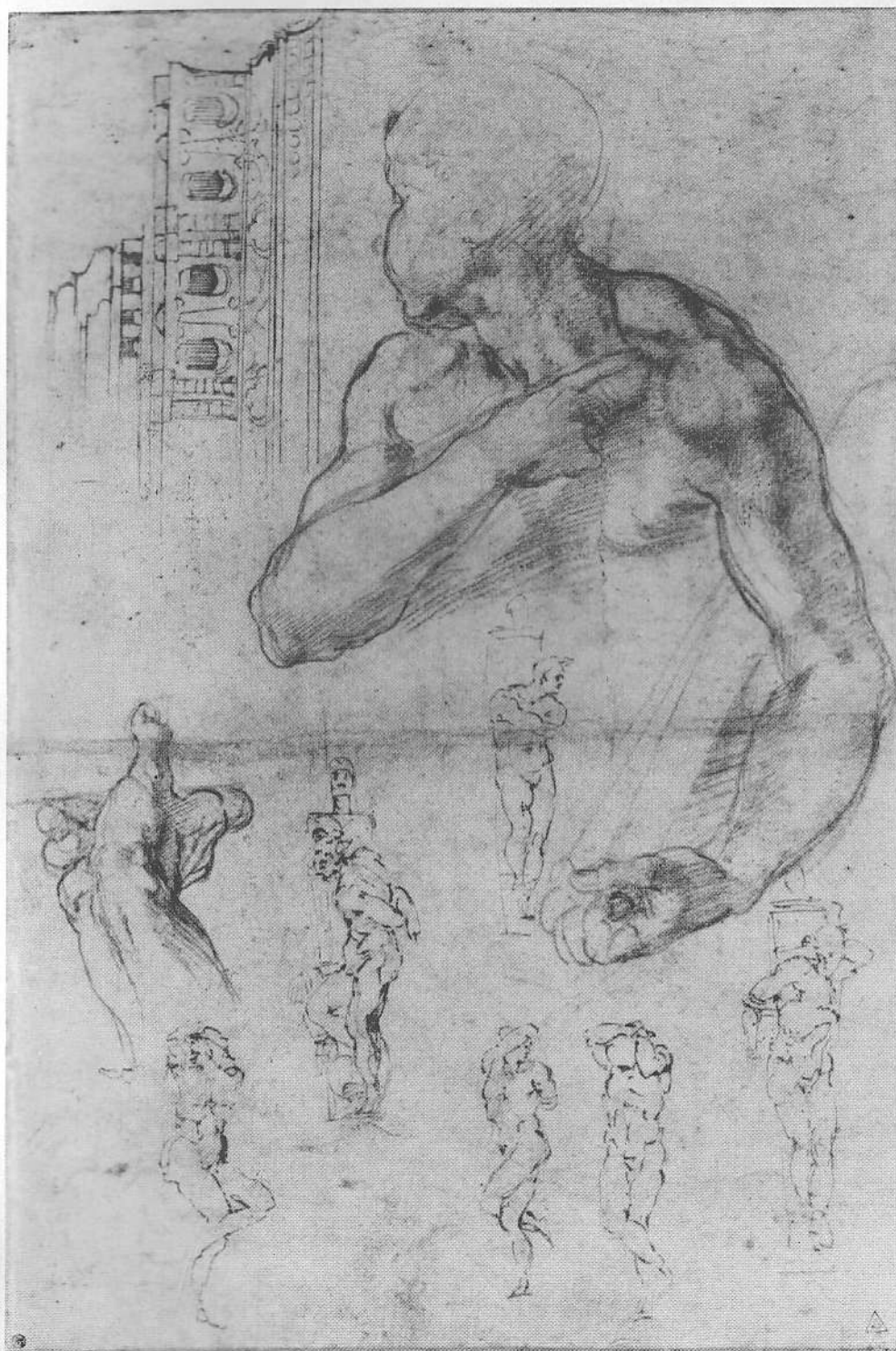
On the left is the location of gluteus medius viewed from the front; on the right the location of gluteus medius viewed from the back.



STUDY FOR THE TORSO OF THE VICTORY 1527, black chalk 8 $\frac{7}{8}$ " \times 6 $\frac{3}{8}$ " (22.54 \times 16.19 cm)

CHAPTER FIVE

THE UPPER LIMB



VARIOUS STUDIES FOR THE SISTINE CEILING
Ink 11¼" × 7⅞" (286 × 194 cm)

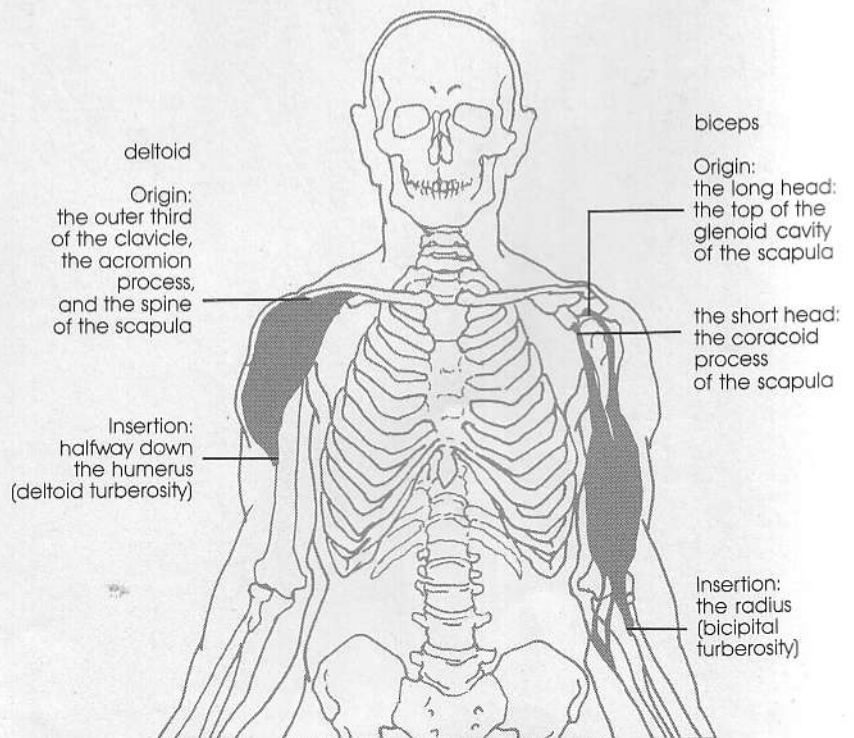
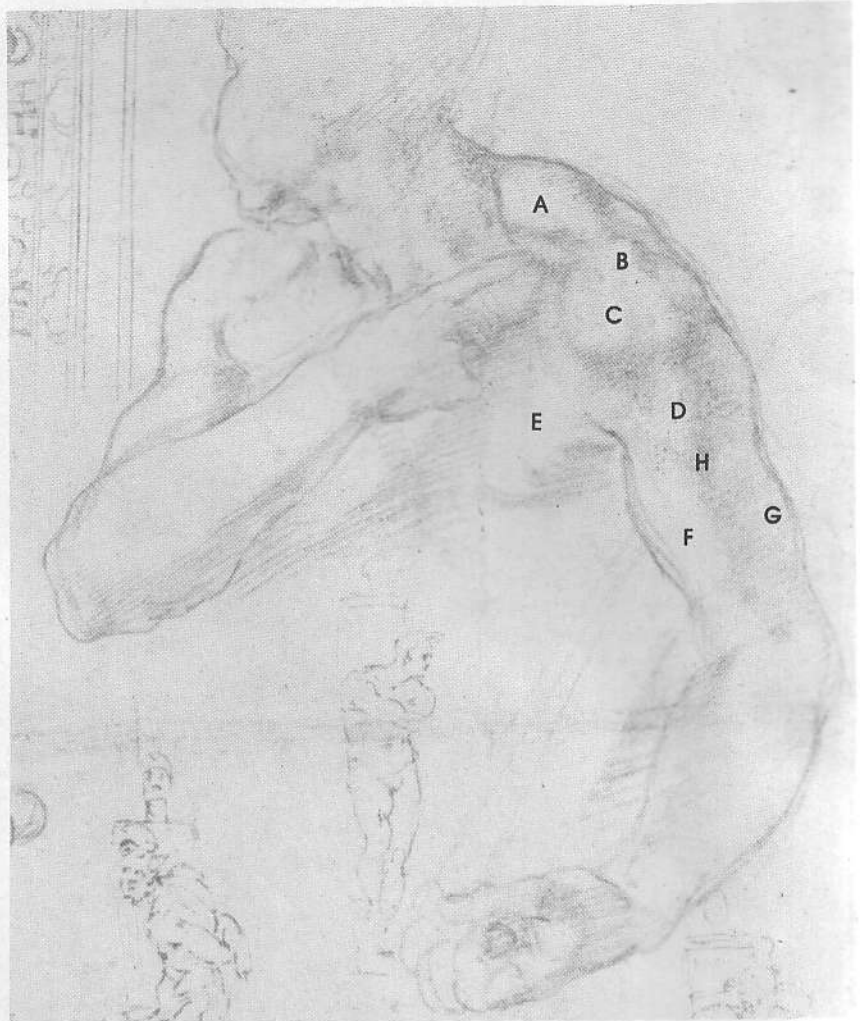
The Muscles of the Upper Arm

In this handsome drawing the forms of the neck, shoulder, and arm are distinctly articulated. A small portion of the large trapezius muscle (A) of the back is visible between the neck and shoulder. The meeting of the outer end of the clavicle (B) with the acromion process of the scapula is a clearly indicated landmark at the summit of the shoulder. The ball-shaped upper part of the deltoid muscle (C) is beautifully modeled; the lower fibers of the muscle are indicated at D. The upper portion of the deltoid wraps around and covers the ball-and-socket joint of the shoulder, which accounts for the deltoid's spherical shape. Its strong modeling adds to the illusion of a form that has been pushed forward.

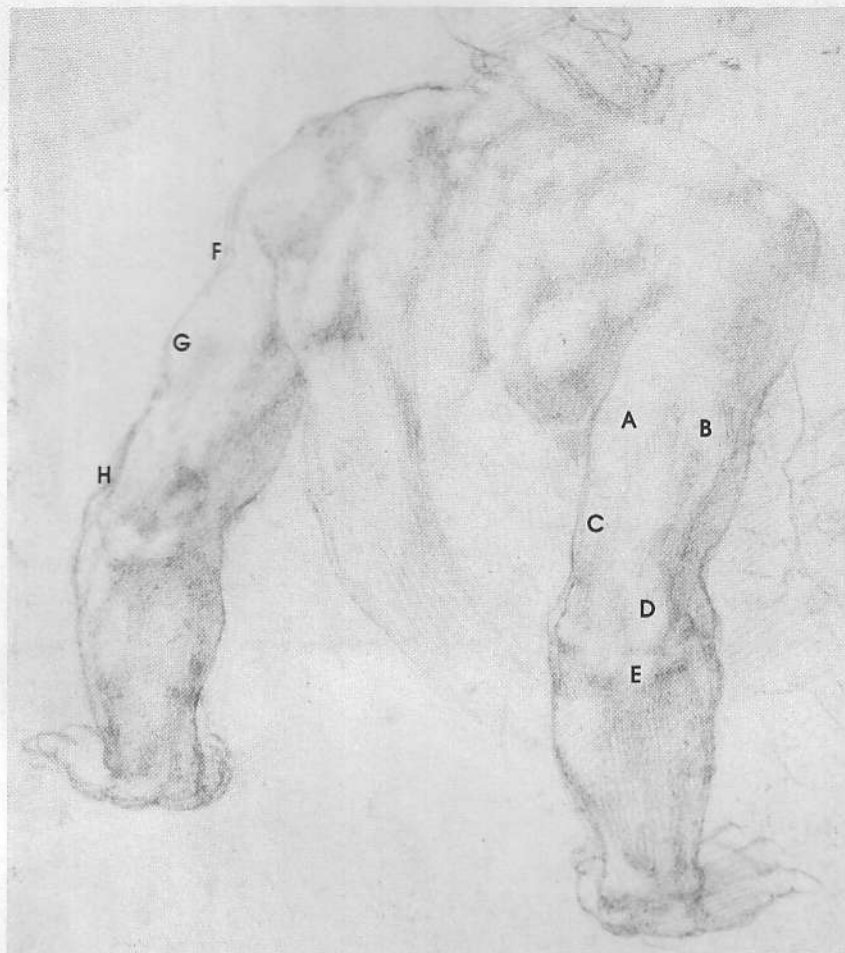
The entire deltoid muscle is similar in shape to an upside-down triangle. It originates at the bottom outer third of the clavicle, the acromion process, and the bottom of the spine of the scapula. The fibers of the deltoid extend downward from these points and insert at a point about halfway down the outside of the shaft of the humerus. Its function is to raise the arm up to the level of the shoulders. The muscle forms that surround the deltoid are the trapezius (A), the pectoralis major (E), the biceps (F), and the triceps (G). The apex of the deltoid muscle (H) lies between the masses of the biceps and the triceps.

The biceps muscle (its name means "two-headed") arises from the scapula. The short head arises from the coracoid process—a process which resembles a bent finger—on the front of the scapula. The long head arises from the top of the glenoid cavity of the scapula. The biceps then dips into the pit of the elbow and terminates at one of the bones of the forearm, the radius. The action of the biceps is to flex, or bend, the forearm toward the upper arm, which causes the elbow to bend. This muscle also plays a role in the action of supination, or rotation of the palm to an upward position.

There is much to be learned by observing the extreme position of the hand at I. Michelangelo's use of line clearly expresses the anatomy of this difficult-to-draw, foreshortened form. Notice how often one line overlaps another. Overlapping is an excellent device for indicating the position of one form in front of another. The lines in this drawing show that the forearm is in front of the wrist, that the wrist is in front of the body of the hand, and that the body of the hand is in front of the fingers.



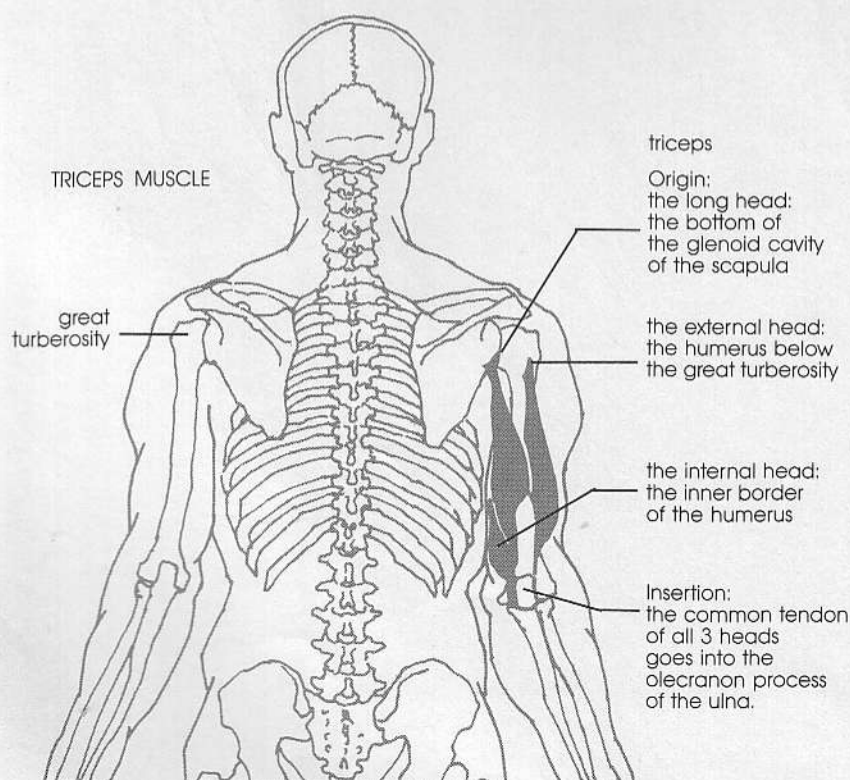
Triceps: The Three-Headed Muscle



This drawing shows the triceps mass located on the back of the arm. The triceps muscle works against the biceps, which is located on the front of the arm. The triceps straightens the forearm, opening up the elbow, while the biceps flexes, or bends, the forearm, closing the elbow. The triceps has three heads, as its name implies. The long head (A) originates at the bottom of the glenoid cavity of the scapula. The other two heads originate on the humerus: the external head (B) at the outer border of the humerus just below the greater tuberosity, and the internal head (C) on the inner border of the shaft of the humerus. All three portions of the triceps terminate in a common tendon (D), which crosses the back of the elbow joint to attach to the point of the elbow, or olecranon process (E) located on the ulna. The common tendon of the triceps forms a flat area above the point of the elbow and extends about halfway up the back of the arm.

If the triceps muscle is well developed, or contracted, the masses created by the three heads will show clearly around the flattened area of the common tendon. When the muscle is relaxed, the forms on the back of the arm often appear as a single cylinderlike mass.

It is important to notice how the triceps affects the outside shape of the back of the arm. Just under the deltoid muscle at F the arm narrows; halfway down the triceps the arm is wider at G; the arm becomes narrow again at the top of the elbow (H).



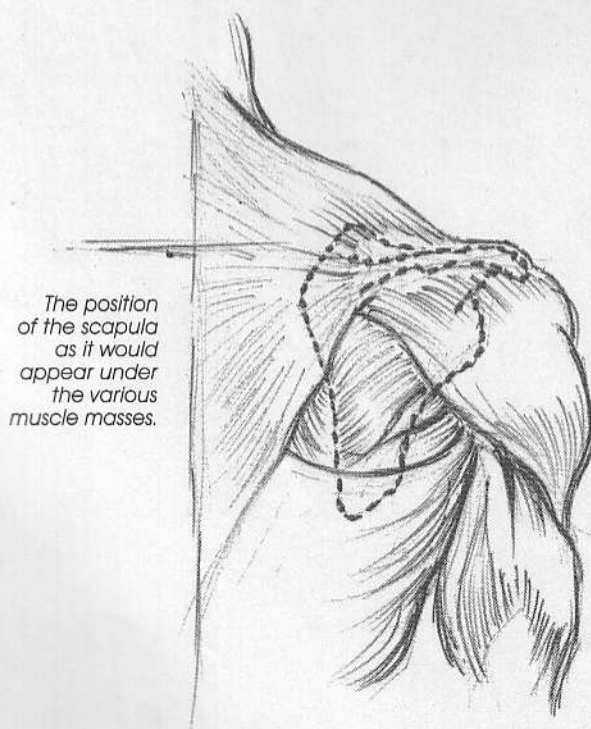


STUDY FOR ONE OF THE DEAD RISING (BACK), 1534-35, black chalk 11½" × 9¼" (29.21 × 23.50 cm)

The Relationship of the Forms of the Arm to the Scapula



STUDIES FOR LEFT ARM
AND SHOULDER OF DAY
1520-21, black chalk
15¼" × 9" (40.01 × 22.86 cm)

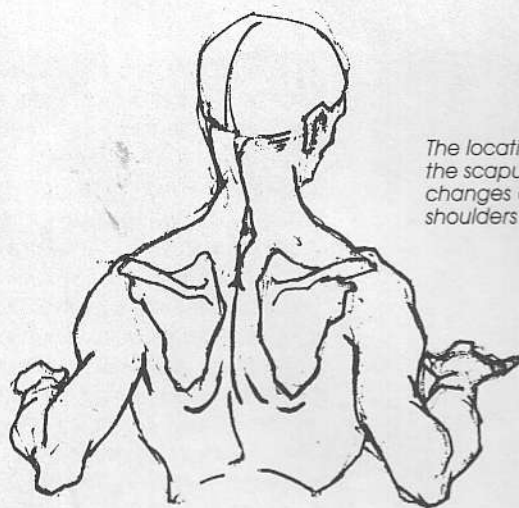


*The position
of the scapula
as it would
appear under
the various
muscle masses.*

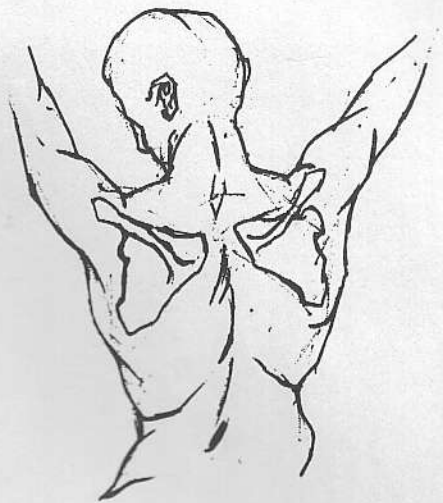
Here is another magnificent study of the relationship between the muscles on the back of the arm and on the scapula. The small egglike mass on the lower end of the scapula is the teres major muscle (A). The mass above it at B is made up of the infraspinatus muscle and the teres minor muscle. Because of the backward position of the arm, you can notice that these forms of the upper back are bulging in a state of contraction. Resting over the top of the shoulder and receiving a lot of light is the trapezius muscle (C). The separation of the trapezius and the deltoid muscle is indicated by a change in the direction of the line at D. Double curves (E and F) define the shape of the deltoid.

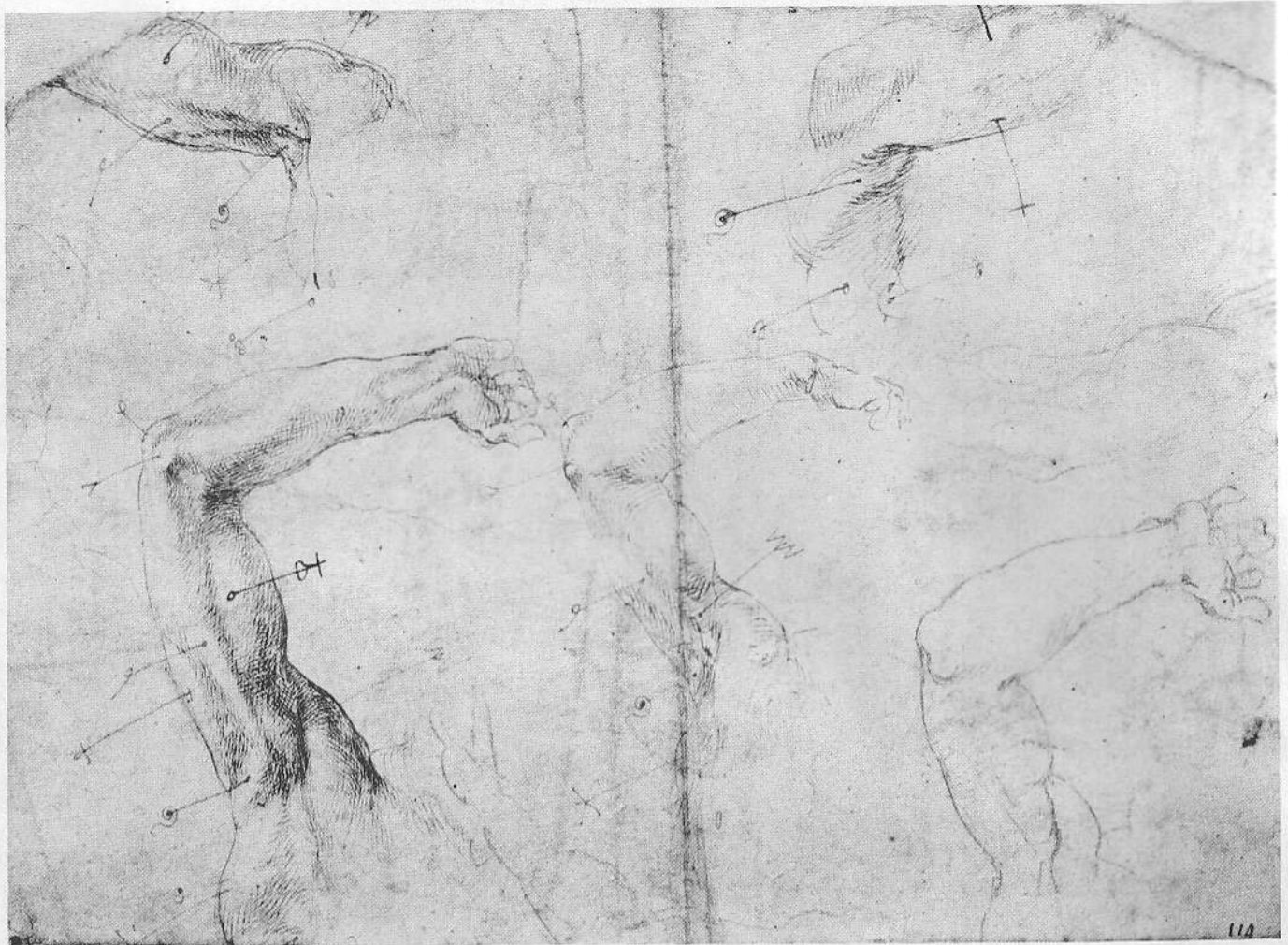
In this bent position of the arm the forms on the back and inside of the arm are visible. The external head (G), the internal head (H), and the long head of the triceps (I) are all clearly separated from the lower border of the deltoid. The common tendon (J) lies above the point of the elbow (K). To the inside of the point of the elbow is the inner lower end, or condyle, of the humerus (L), which forms a prominent landmark.

The ability of the scapulae to move on the rib cage is extensive. Thus the shapes of muscles in this area will vary greatly according to the pose of the model.

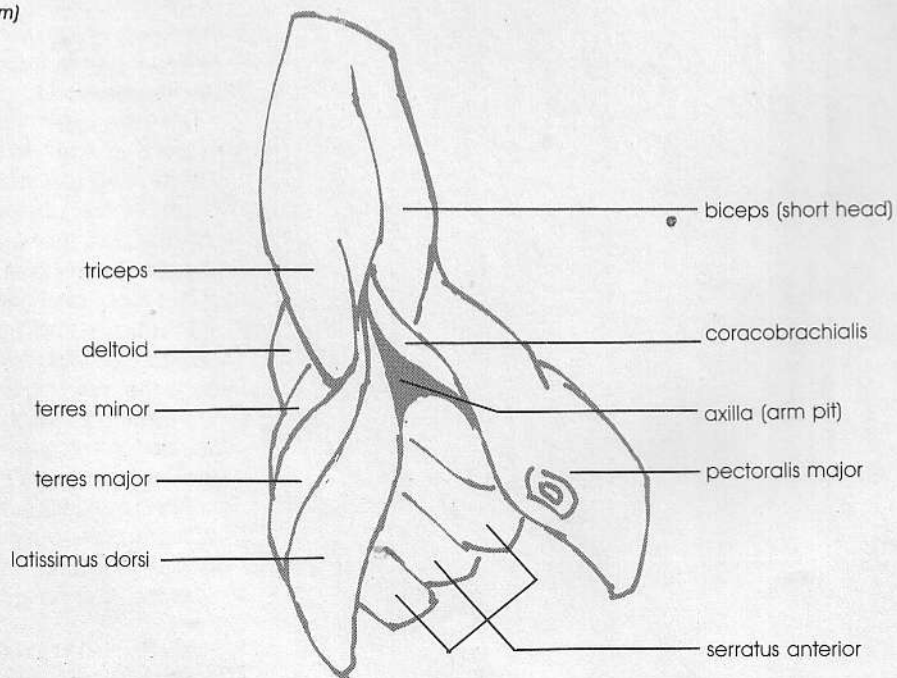


*The location of
the scapulae
changes as the
shoulders move.*

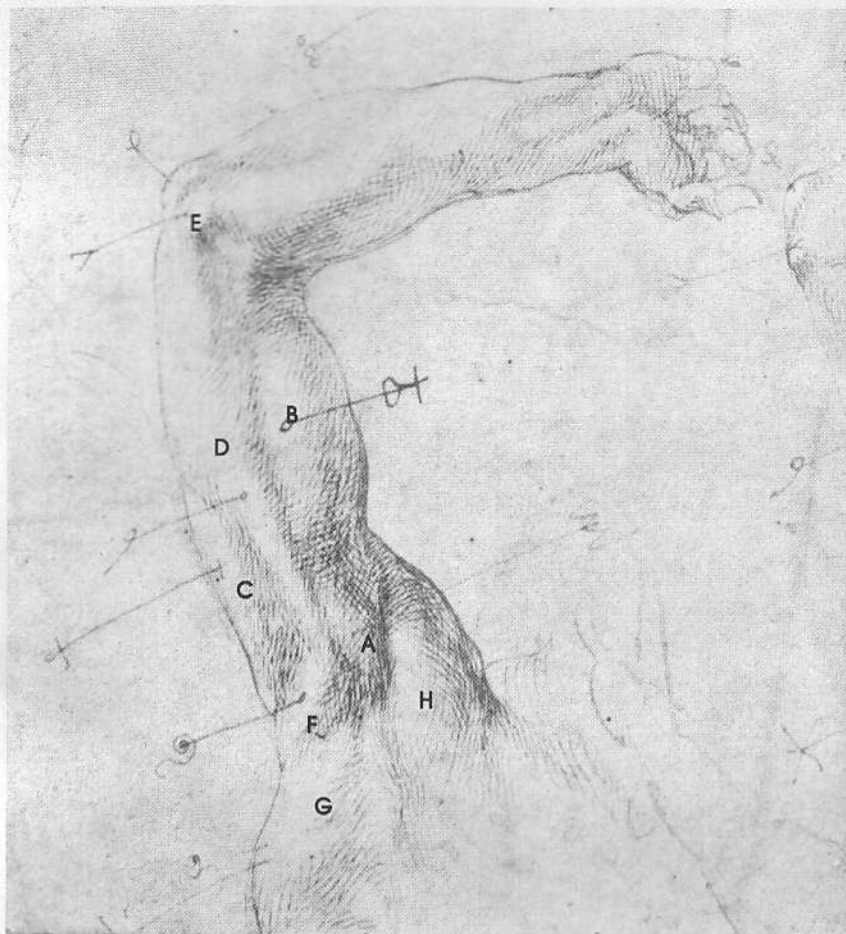




SIX STUDIES OF A RAISED RIGHT ARM
FOR BATTLE OF CASCINA
1504, black chalk and pen
8 7/8" x 12 3/8" (22.54 x 31.43 cm)



The Muscles of the Raised Arm



An excellent way to observe the skill of an artist is in the drawing of the raised arm. In this area there are three muscles that originate from the coracoid process of the scapula. The first is the pectoralis minor, a small muscle that is covered by the pectoralis major and generally does not appear on the surface of the body. The second is the short head of the biceps. The third is the coracobrachialis muscle, which appears on the inside of the arm when the arm is raised; it has therefore been called the "crucifixion muscle." Small and slender, it is visible at A. It extends upward from the armpit and inserts into the upper arm about halfway up the shaft of the humerus between the biceps (B) and the long head of the triceps (C). The coracobrachialis muscle is an adductor of the arm; that is, it pulls the arm toward the side of the torso.

Also visible in this drawing is the internal head of the triceps (D), the inner condyle of the humerus (E), the small mass of the teres major (F), and the mass of the latissimus dorsi (G). The teres major and the latissimus dorsi extend from the back of the figure and pass in front of the long head of the triceps to terminate in the front of the shaft of the humerus. The latissimus dorsi forms the back flap of the armpit, while the pectoralis major (H) forms the front flap.

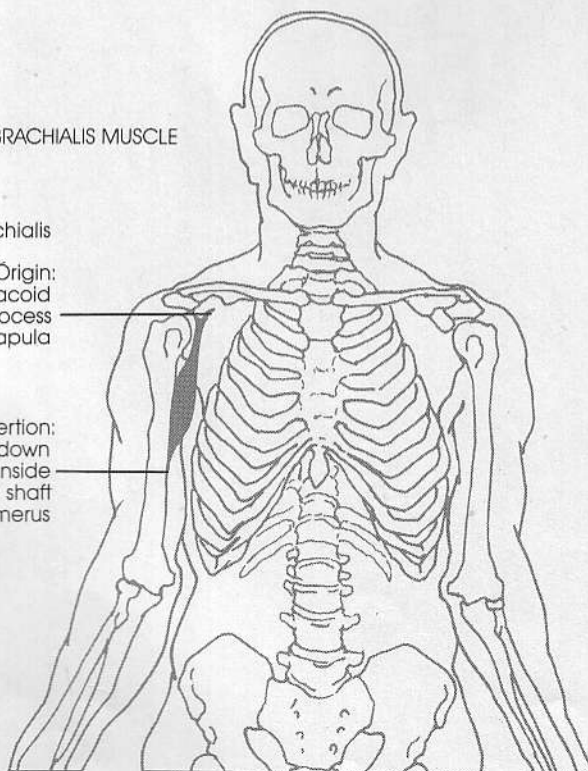
Michelangelo made many studies of the raised arm. He did so as a way of knowing the forms in this area and how they change shape in slightly different positions. The origins and insertions of the muscles involved in the raised arm may present a challenge at first, but with study you should be able to draw this complicated area of the figure without any difficulty at all.

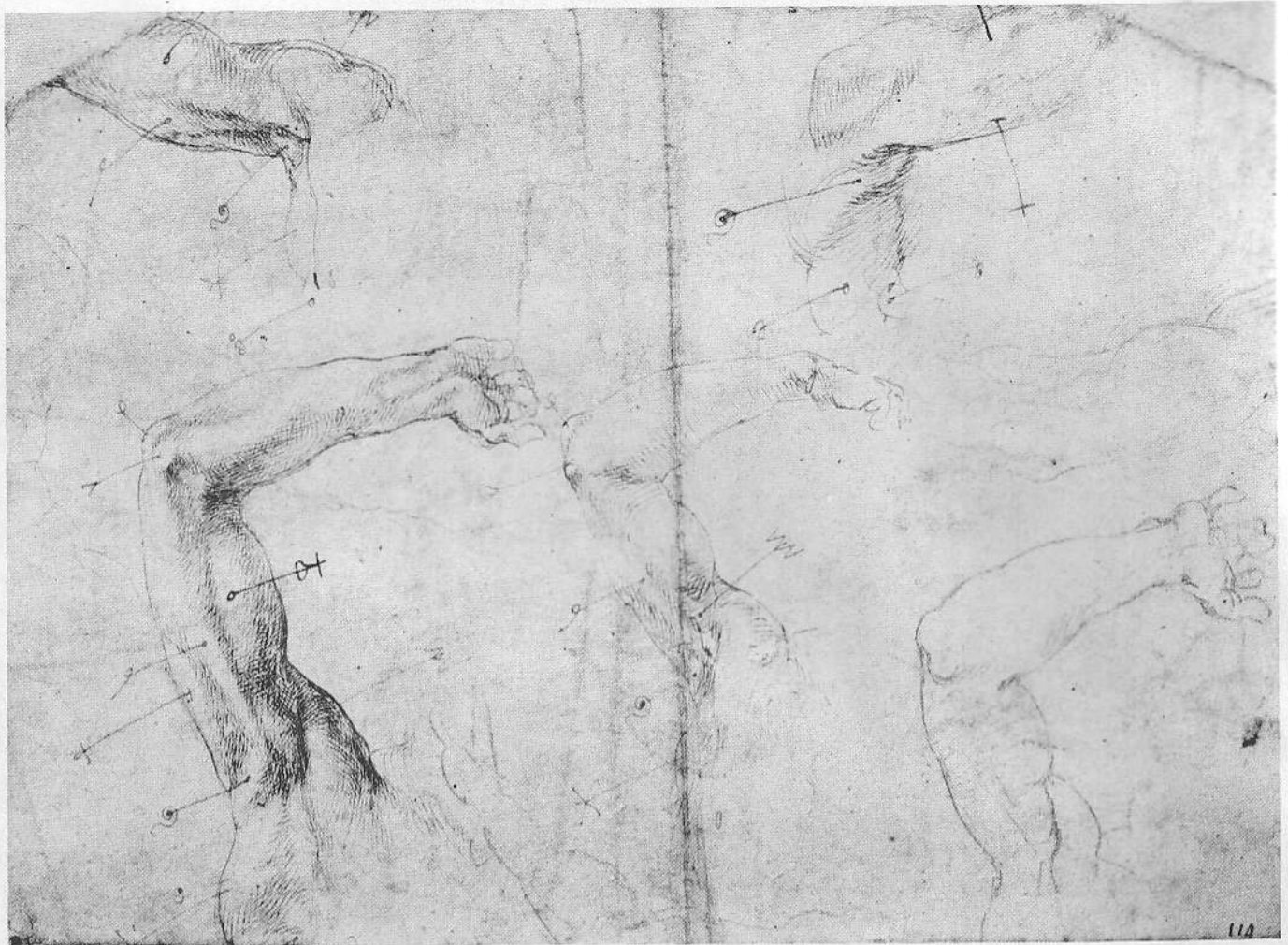
CORACOBRACHIALIS MUSCLE

coracobrachialis

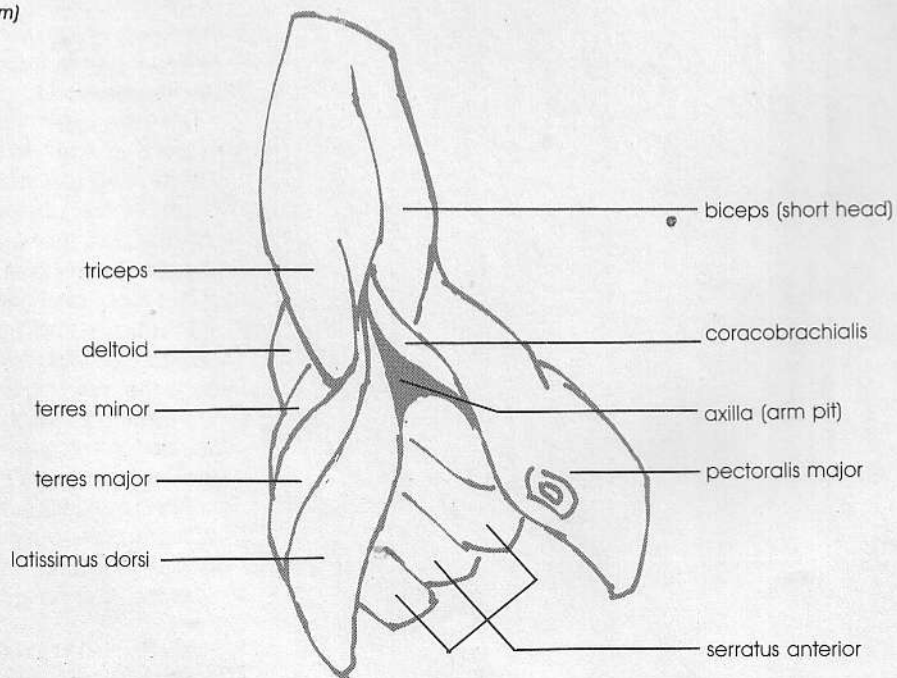
Origin:
the coracoid
process
of the scapula

Insertion:
halfway down
the inside
of the shaft
of the humerus

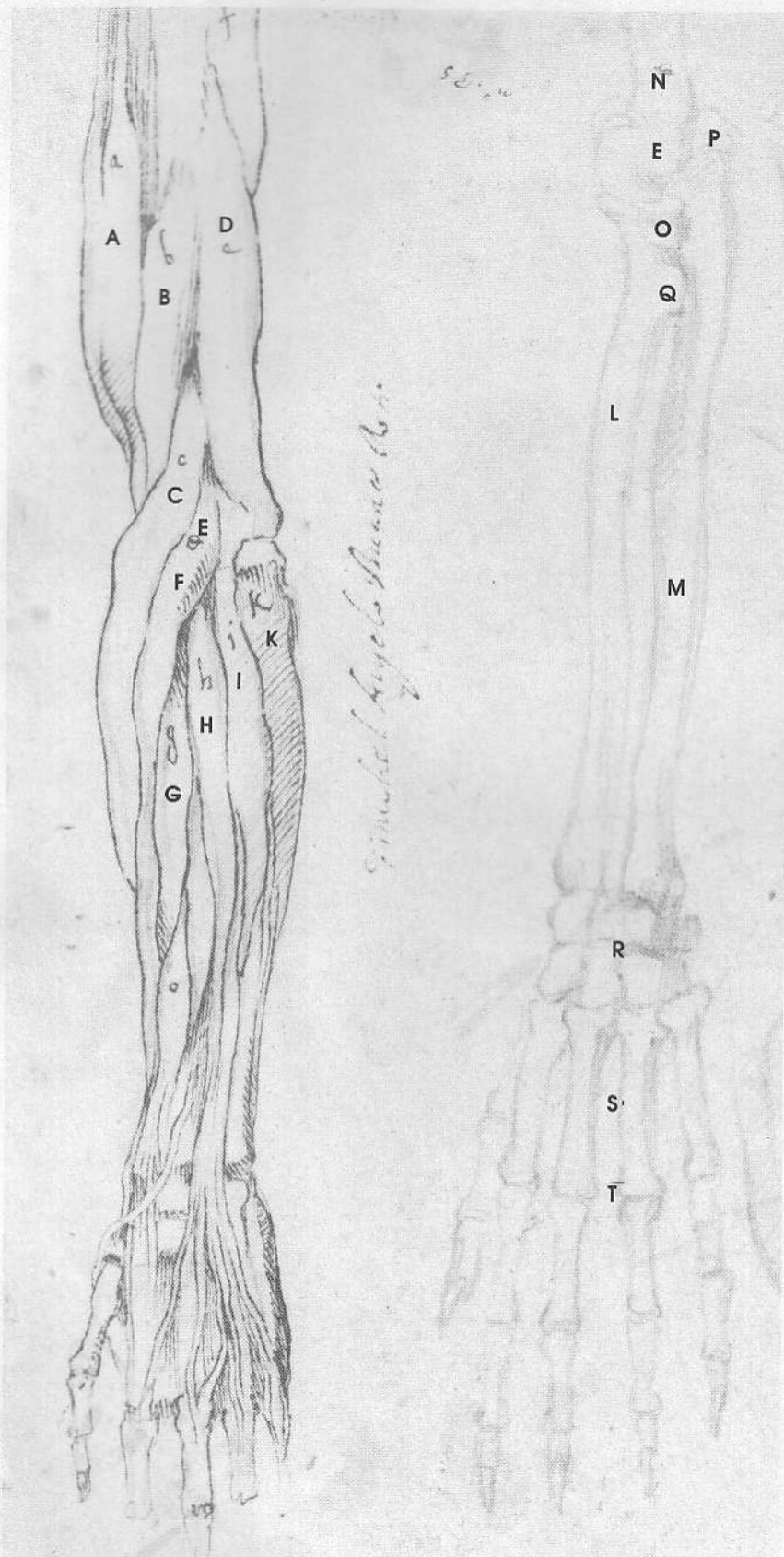




SIX STUDIES OF A RAISED RIGHT ARM
FOR BATTLE OF CASCINA
1504, black chalk and pen
8 7/8" x 12 3/8" (22.54 x 31.43 cm)



The Muscles and Bones of the Forearm



The skeleton of the forearm is drawn here in the position of demipronation, that is, with the palm of the hand turned halfway between pronation, or facing downward, and supination, or facing upward. When the hand is in supination, the two bones of the forearm and the muscles of the forearm lie next to one another. But in pronation, the radius rotates, or crosses, over the ulna, and the muscles also cross. The forearm then changes from a flat, blocklike mass to become cylindrical in shape. In demipronation, the two bones—the radius (L), on the thumb side of the forearm, and the ulna (M), on the little-finger side—and the forearm muscles are in a position where they are beginning to cross themselves.

At the elbow, the top of the ulna joins the bottom of the humerus (N) as a hinge joint, which permits flexion (bending) and extension (straightening) of the forearm on the arm. The top, or head, of the radius (O) is shaped like a horizontal disc, which is hollowed out on top. This hollowed-out disc fits up against a ball-like shape, the capitulum, on the bottom of the humerus, on which it spins. The spinning motion of the disc causes the radius to rotate around the ulna; the palm of the hand is thus turned downward and upward through movements of pronation and supination.

The projection of bone at P represents the point of the elbow, or olecranon. The projection of bone on the radius below the head at Q is the bicipital tuberosity, to which the tendon of the biceps is attached.

There are eight bones in the wrist (R). It is not necessary to draw all eight wrist, or carpus, bones when you draw the arm, but it is important to indicate the mass or shape that they create between the forearm and the hand.

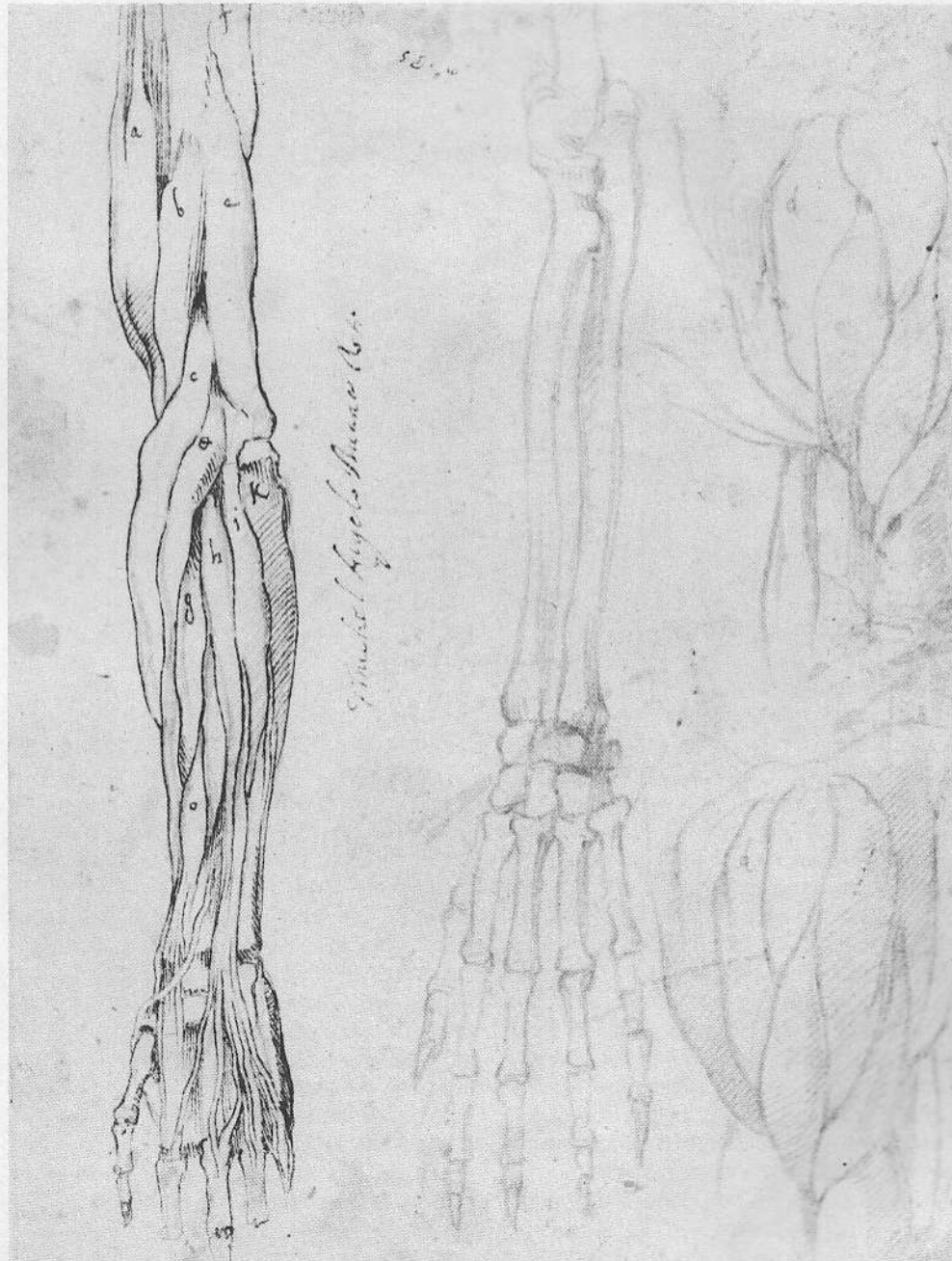
From the top of the arm to the fingers the sections of the arm become progressively shorter and narrower. The forearm is the length of the upper arm less one-fifth. The hand equals the length of the forearm less one-fifth. The mass of the wrist is twice as wide as it is long, and the metacarpal bones (S), which form the body of the hand, are twice as long as the wrist. The line of the knuckles (T) marks the meeting of the metacarpal bones and the first of three sections of phalanges, the bones of the fingers. This important juncture is midway between the top of the wrist and the ends of the fingers. The length of the fingers are roughly equal to the wrist and body of the hand.

On the anatomical arm on the left a flat

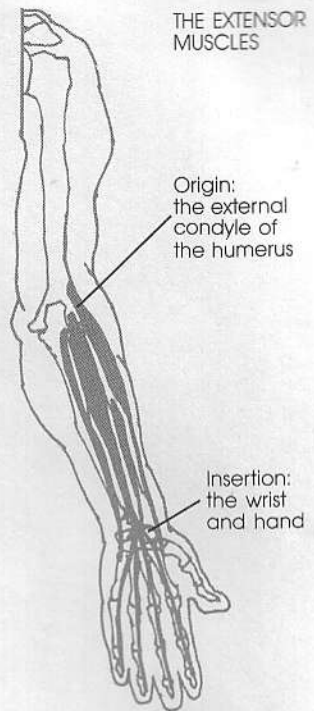
muscle on the front of the arm known as the brachialis (B) is visible between the biceps (A) and the triceps (D). The brachialis originates at the front lower half of the humerus and terminates at the front of the ulna at the top of the coronoid process. This muscle works in concert with the biceps to flex the forearm toward the upper arm. The front surface of this muscle is covered by the superficial biceps, but its lateral borders are visible on the outside of the arm.

On the back of the forearm is the extensor mass made up of four muscles. Each of them

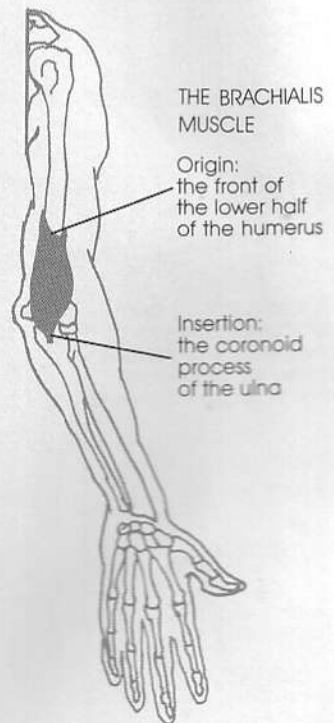
originates at the external condyle (E) of the humerus and extends downward sending tendons into the wrist and hand. The four muscles are the long radial extensor of the wrist and hand, or extensor carpi radialis longus (F); the short radial extensor of the wrist and hand, or extensor carpi radialis brevis (G); the common extensor of the fingers, or extensor digitorum (H); and the ulnar extensor of the wrist, or extensor carpi ulnaris (I). The shaft of the ulna is visible at K. The long supinator muscle (C) extends downward from above the elbow and terminates in the lower end of the radius.



STUDIES FOR LEFT ARM EXTENDED, BONES OF A LEFT HAND AND FOREARM, AND A LEFT SHOULDER FROM FRONT AND SIDE
 red chalk 10 1/2" x 7 1/8" (26.35 x 20 cm)

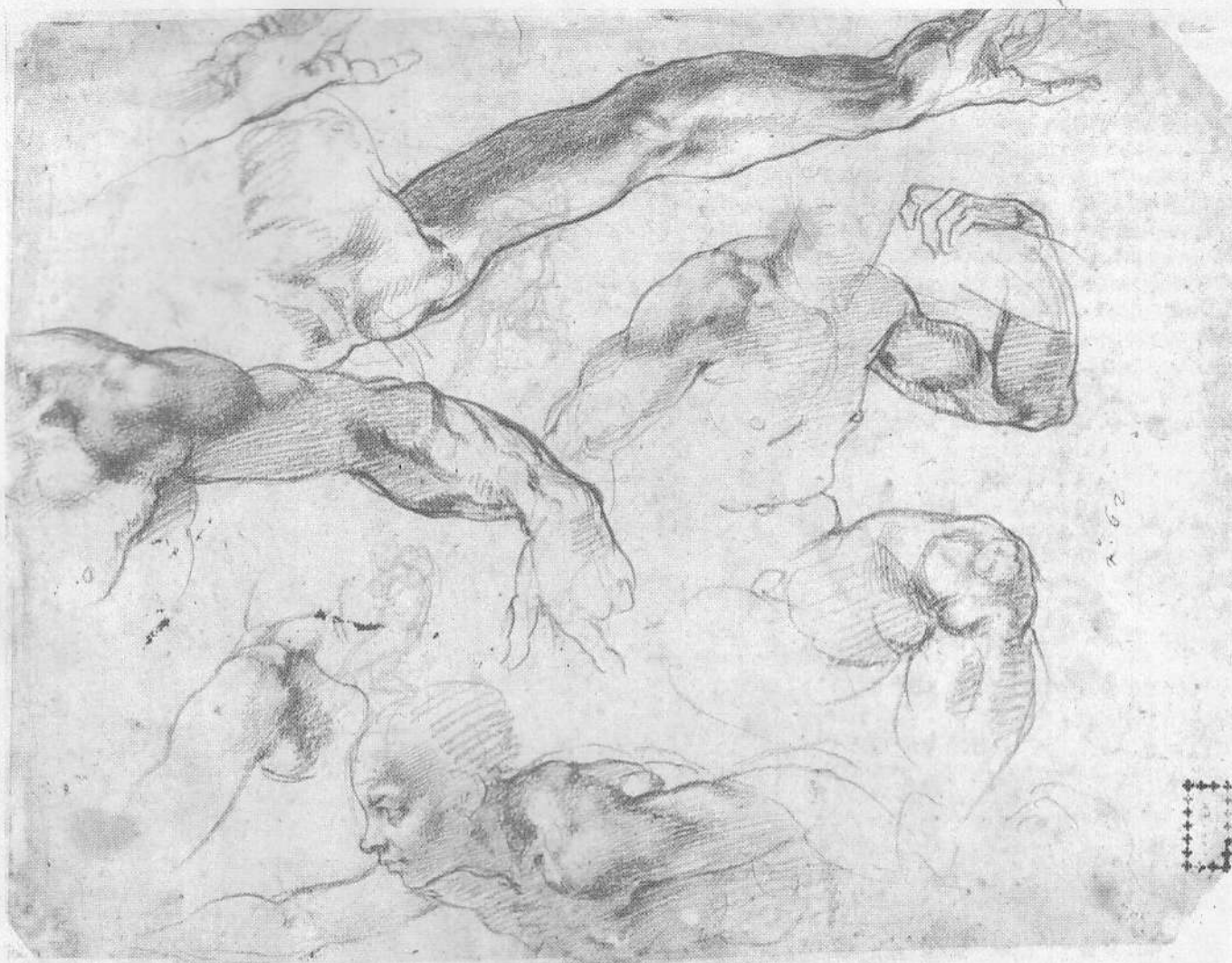


BACK VIEW



FRONT VIEW

The Muscles of the Forearm and Thumb



ARM STUDIES FOR THE LORD
AND STUDIES FOR ANGELS
IN THE CREATION OF ADAM
1511, red and black chalk
8 3/8" x 11" (21.27 x 27.94 cm)

Here are a series of studies of the arm in different positions and directions in space. The arm at A is separated from the background by a bold line, which defines its form. There are some twenty muscles in the forearm, but in figure drawing these forms are massed into three groups—the flexor muscles as one group, the extensor muscles as another, and the long supinator as a third mass of the forearm. Almost all of these muscles originate from the condyles of the humerus and attach to the bones of the wrist and hand. Because the muscles become tendinous about halfway down the forearm, the contour of the arm changes. The egglike shape of the upper half of the forearm is caused by the fleshy fibers of the muscles; the blocklike shape of the lower half is formed by the tendons and the two bones—the radius and ulna—of the forearm.

The flexor muscles (B), on the front of the forearm, originate from the inner condyle of the humerus and consist of four muscles—the

pronator teres; the flexor of the wrist on the radius, or flexor carpi radialis; the palmaris longus; and the flexor of the wrist on the ulna, or flexor carpi ulnaris. The pronator teres, which terminates halfway down the outer border of the radius, is one of the muscles responsible for the rotational movement of the forearm, wrist, and hand. It contracts, rotating (crossing) the radius over the ulna, which places the hand palm downward (pronation). The other three superficial flexors, which insert into the under side of the wrist and hand, are responsible for bending (flexing) the wrist and hand forward, toward the front of the forearm.

Beneath these four superficial flexors is a deeper flexor muscle, the flexor digitorum superficialis. It is visible only where its tendons appear on the wrist between the tendons of the more superficial flexors. Deeper still and not visible on the surface is the flexor digitorum profundus, directly under the flexor digitorum superficialis. The powerful tendons of

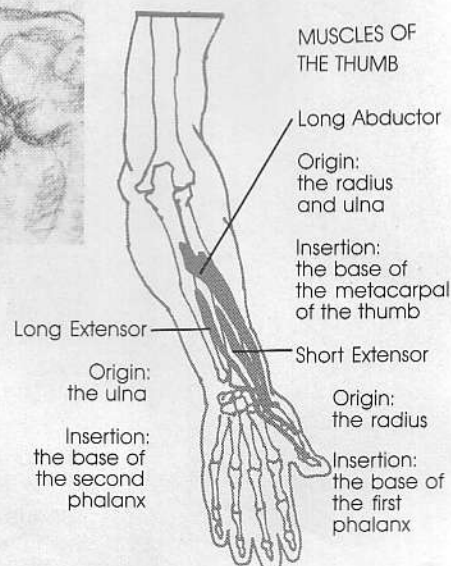
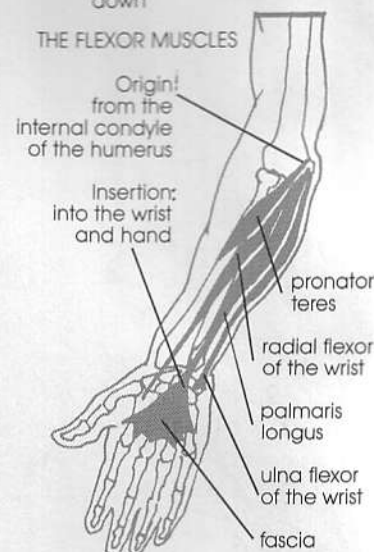
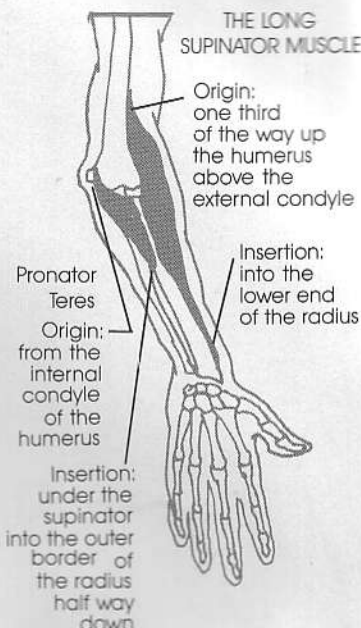
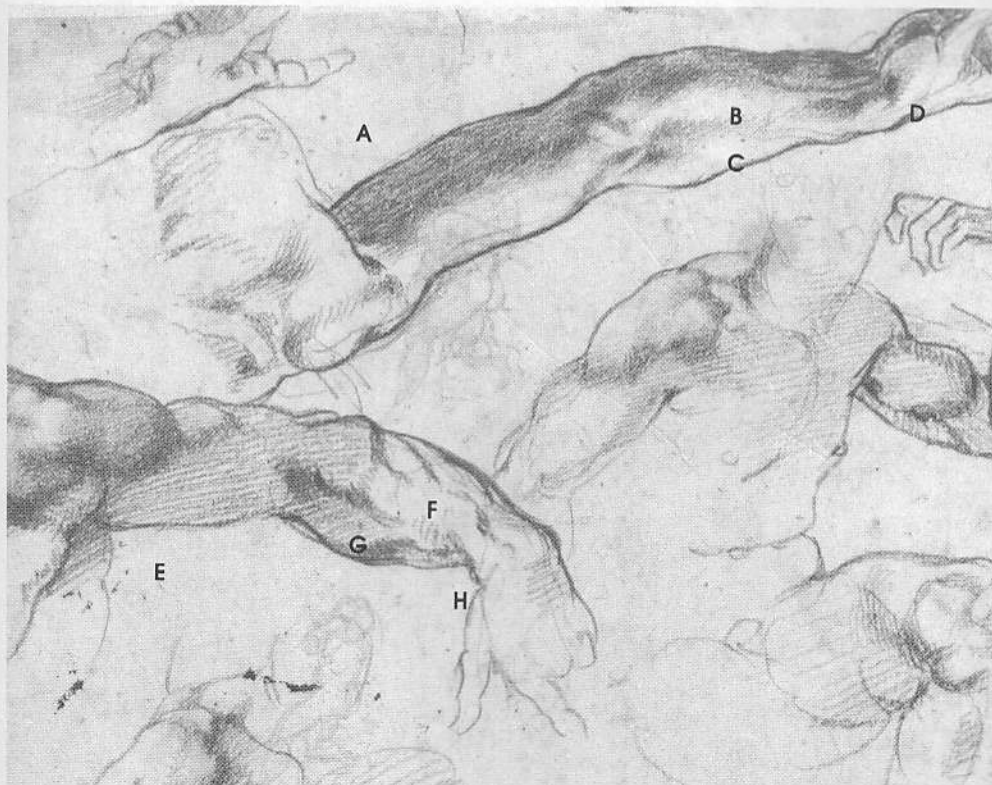
these two muscles extend downward to the bones of the fingers, making possible the flexing or grasping of the hand and fingers. Because these two muscles are deep, they are not involved in drawings of the large masses of the forearm.

The extensor muscles, on the back of the forearm, arise from the external condyle of the humerus. They extend or bend the wrist and hand backward.

The third mass of the forearm is formed by the long supinator or brachioradialis muscle (C) which arises above the external condyle of the humerus and inserts into the lower end of the radius. The supinator works against the pronator rotating the radius back to a position parallel to the ulna, which turns the hand with the palm facing upward (supination). It will also help the biceps flex the forearm toward the upper arm. The key to drawing this area correctly is to be able to visualize the position of the radius and ulna first.

On the lower third of the forearm, which affects its outside contour, is a small mass (D), which originates on the back of the forearm. This mass is created by the three muscles that operate the thumb: the long extensor of the thumb, or extensor pollicis longus; the long abductor of the thumb, or abductor pollicis longus; and the short extensor of the thumb, or extensor pollicis brevis. Most of their length is covered by the more superficial extensor muscles, but the lower parts of the last two form a small mass on the lower end of the forearm above the thumb.

The drawing of the arm and hand in the center of the page at E shows the position of pronation. The radius and extensor mass (F) are pulled forward, while the ulna and flexor mass (G) pass underneath the radius. The lines at H overlap one another and clearly define the position of the radius and wrist in front of the ulna and the flexor mass.



Massing the Forearm

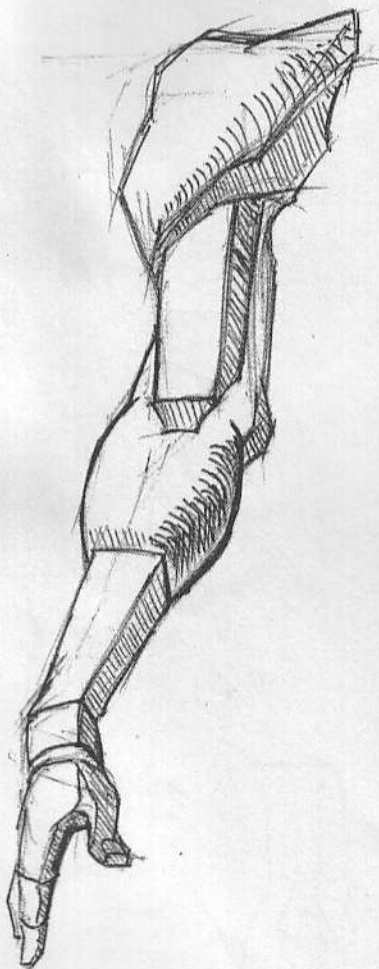
Here is a wonderful page full of studies of the arm in various positions. As has been noted earlier, the upper half of the forearm is often rendered as a rounded form; the lower half is more blocklike. In the lower drawing, notice that the shaft of the ulna, which shows in its entirety on the surface of the forearm, extends upward from the point of the elbow (A) to a projection on the wrist, the head of the ulna (B). The shaft of the ulna (C) separates the extensor mass (D) and the flexor mass (E).

In the drawing on the upper right the elbow (F) is beautifully modeled in light and shade, as is the wrist (G) in the drawing on the left.

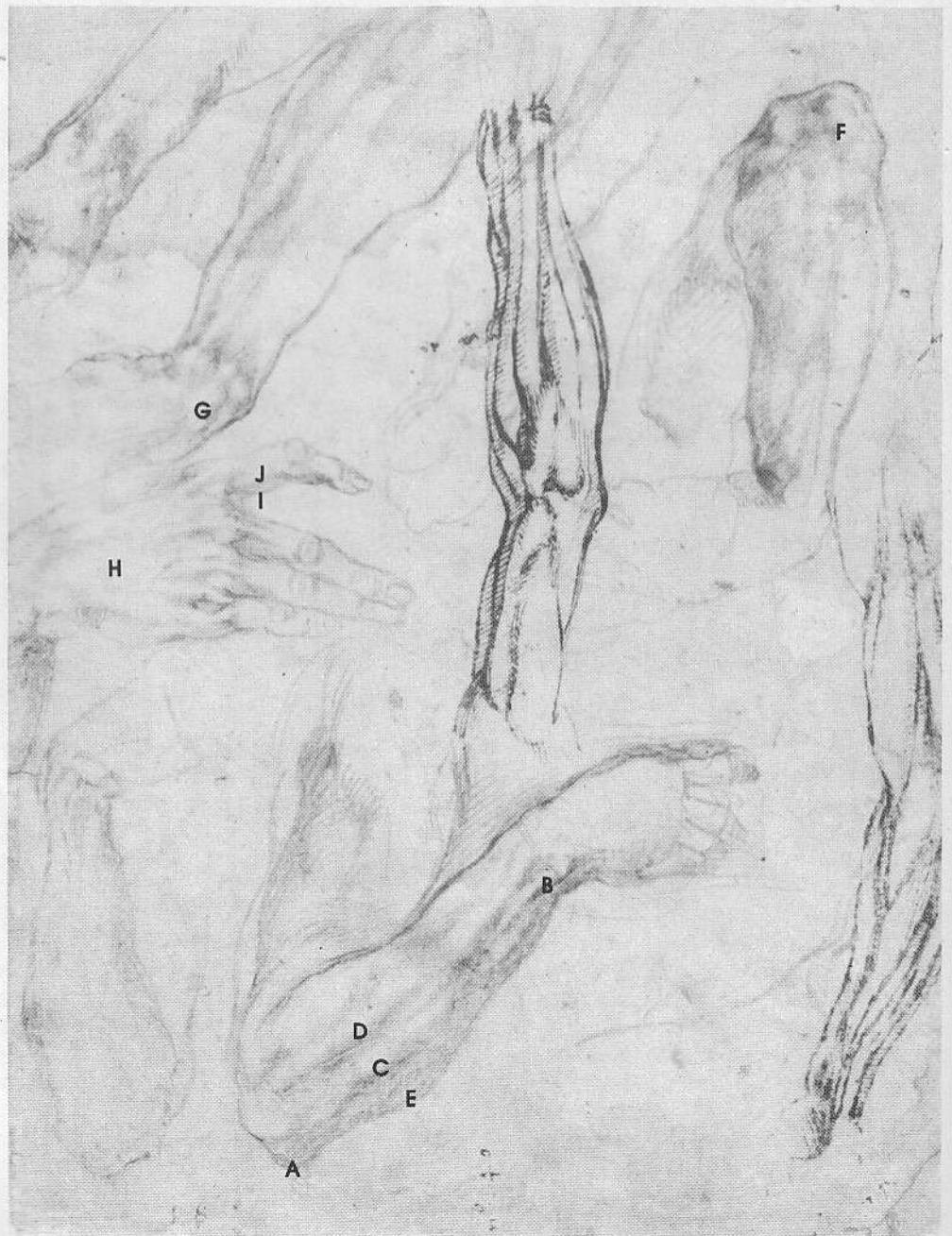
The extensor tendons are clearly depicted

on the back of the hand at H. The fingers are here thought of as rounded blocks; notice that the side plane (I) is in shadow and the top plane (J) is in light.

How can you draw arms beautifully? You should practice drawing arms from a skeleton until you can draw the bones in any position and from memory. Drawing elbows and wrists accurately depends on faithfully rendering the bones under the skin of these areas. Practice drawing the muscle masses on the front, back, and sides of the arm. After you become comfortable with front, side, and back views, try placing the model's arm in more complicated positions.



The arm can be simplified into rounded and blocklike forms.





STUDIES OF ARMS AND HANDS FOR THE DYING SLAVE: DISSECTION OF ARMS 1505-06, red chalk and pen 11¼" × 8¼" (28.58 × 20.96 cm)

The Muscles of the Hand



On the surface of the palm are two muscle groups. The mass under the thumb, the thenar mass (A) in Michelangelo's drawing of the hand at the top of the page, is made up of the muscles of the thumb. There are four of them: an adductor, or adductor pollicis; an abductor, or abductor pollicis brevis; a short flexor, or flexor pollicis brevis; and a muscle, opponens pollicis, which makes the thumb work in opposition to the fingers. Under the little finger are the hypothenar muscles (B), which control the little finger.

On the front of the forearm, where the hand meets the wrist, are the creases, or wrinkles, of the skin called wrist bracelets, C in the drawing to the right. They are most visible when the hand and wrist are pulled toward the front of the forearm. The area on the palm of the hand, between the thenar and hypothenar masses, (D) in the top drawing, is formed by the padding, which protects the hand. As the skin on the hand folds over the joints, wrinkles are formed on the palm. These lines are accentuated by artists to express form.

Crossing the back of the hand, in the right-hand drawing, and extending toward the thumb, is the tendon of the long extensor of the thumb (E). On the outside border of the wrist are the two tendons of the short extensor and the long abductor of the thumb. On the surface these forms appear as one large tendon (F). Between these last two tendons and the tendon of the long extensor a depression (G) called the "anatomical snuffbox" is apparent when the thumb is pulled backward. At one time, men sniffed tobacco from this depression.

The key to drawing hands well is a complete understanding of the skeletal structure and of the fleshy forms that fill it out. You need not learn every small muscle but only the muscle groups.

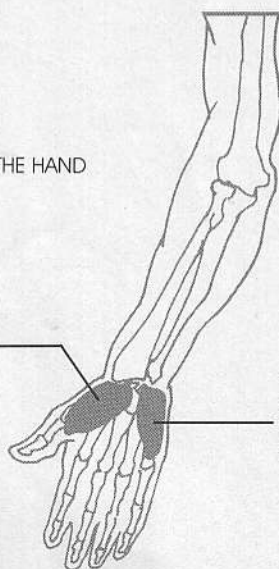
The shapes that areas of the arm assume in foreshortened positions are clearly depicted in the lower drawing. The sections of the arm should be visualized as cylinders placed in front of one another. The contour line used for the right arm at H is actually a series of small, curved, overlapping lines that indicate that the deltoid mass (I) is in front of the upper arm mass (J) and that the upper arm is in front of the forearm (K).

The left arm in the lower drawing at L is extremely foreshortened. The sections of the arm appear as ovals or egglike forms placed one in front of another.

MUSCLES OF THE HAND

The Thenar Mass:
flexor, adductor,
abductor and
opposable muscles
of the thumb

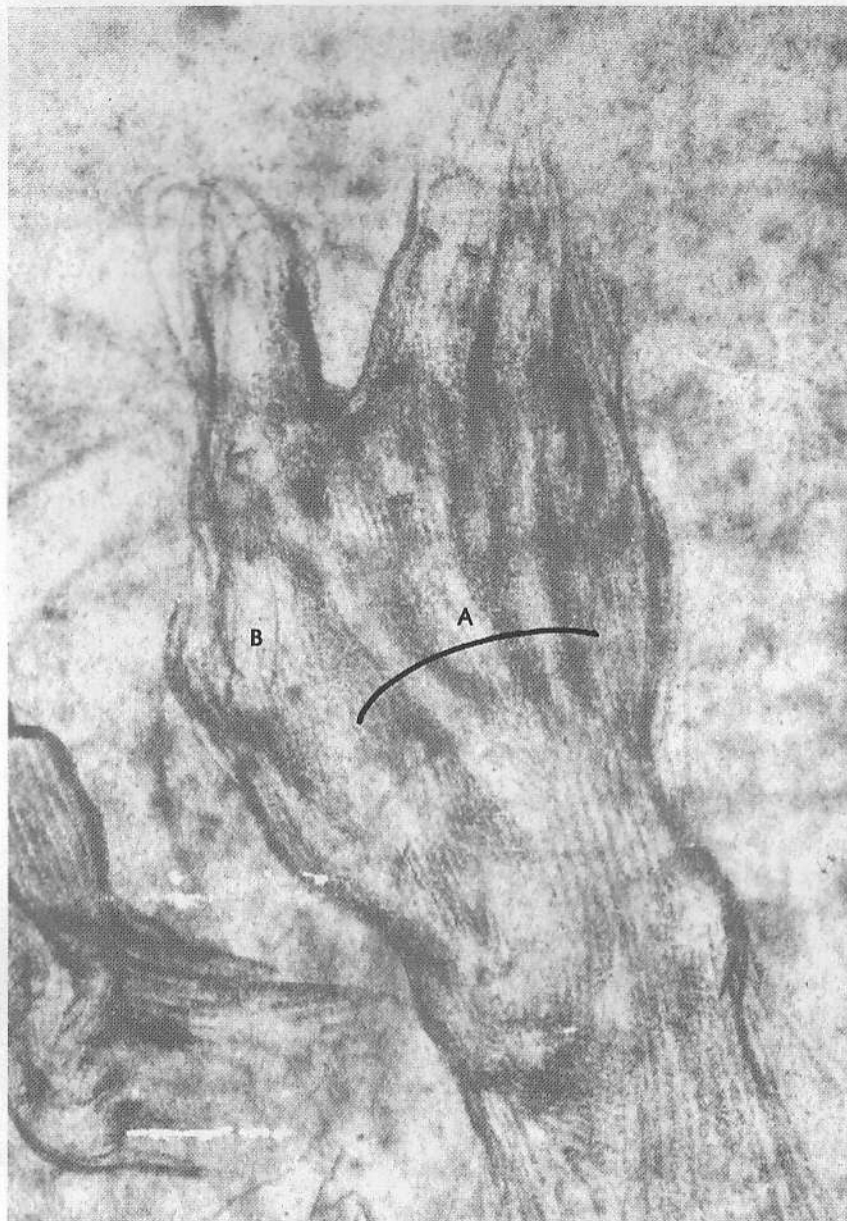
The Hypothenar Mass:
flexor, abductor,
and opposable muscles
of the little finger





STUDIES FOR THE CRUCIFIED HAMAN 1511, red chalk 10" × 7½" (25.40 × 19.05 cm)

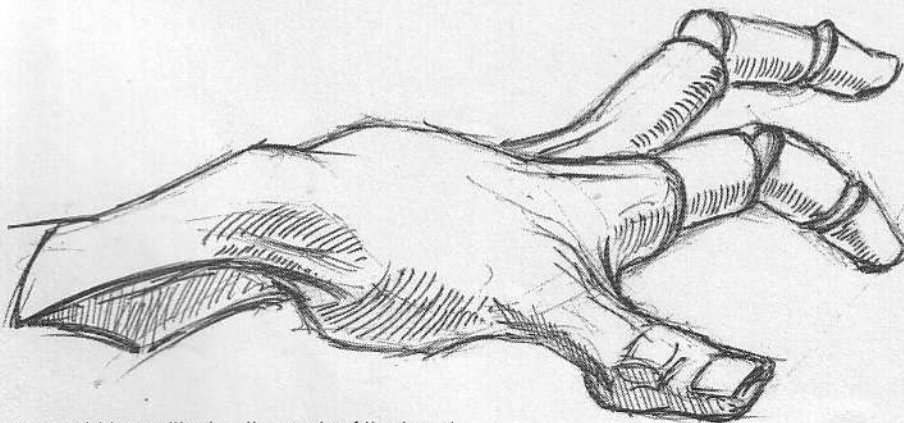
Simplifying the Hand



The tendon of the common extensor of the fingers, or extensor communis digitorum—which is one of the extensor muscles on the back of the forearm—crosses the back of the wrist and branches out into four tendons (A) on the back of the hand. These tendons are clearly visible as they cross the knuckles and disappear on the first bone or phalanx of each of the four fingers. The thumb has its own separate group of muscles and tendons, as noted earlier.

An important small form is a clear mound (B) on the back of the hand between the thumb and index finger. It is formed by the abductor of the index finger, or abductor indicis, whose function is to pull the index finger out away from the other fingers.

In drawing, each finger is formed by three cylinders, the direction and position of which change with each movement of the hand. The thumb, of course, is considered a form composed of two cylinderlike sections. Carefully observe the different direction of the thumb from the fingers relative to the body of the hand. It might be helpful to note the direction of the nails on the fingers in relation to the direction of the nail of the thumb.



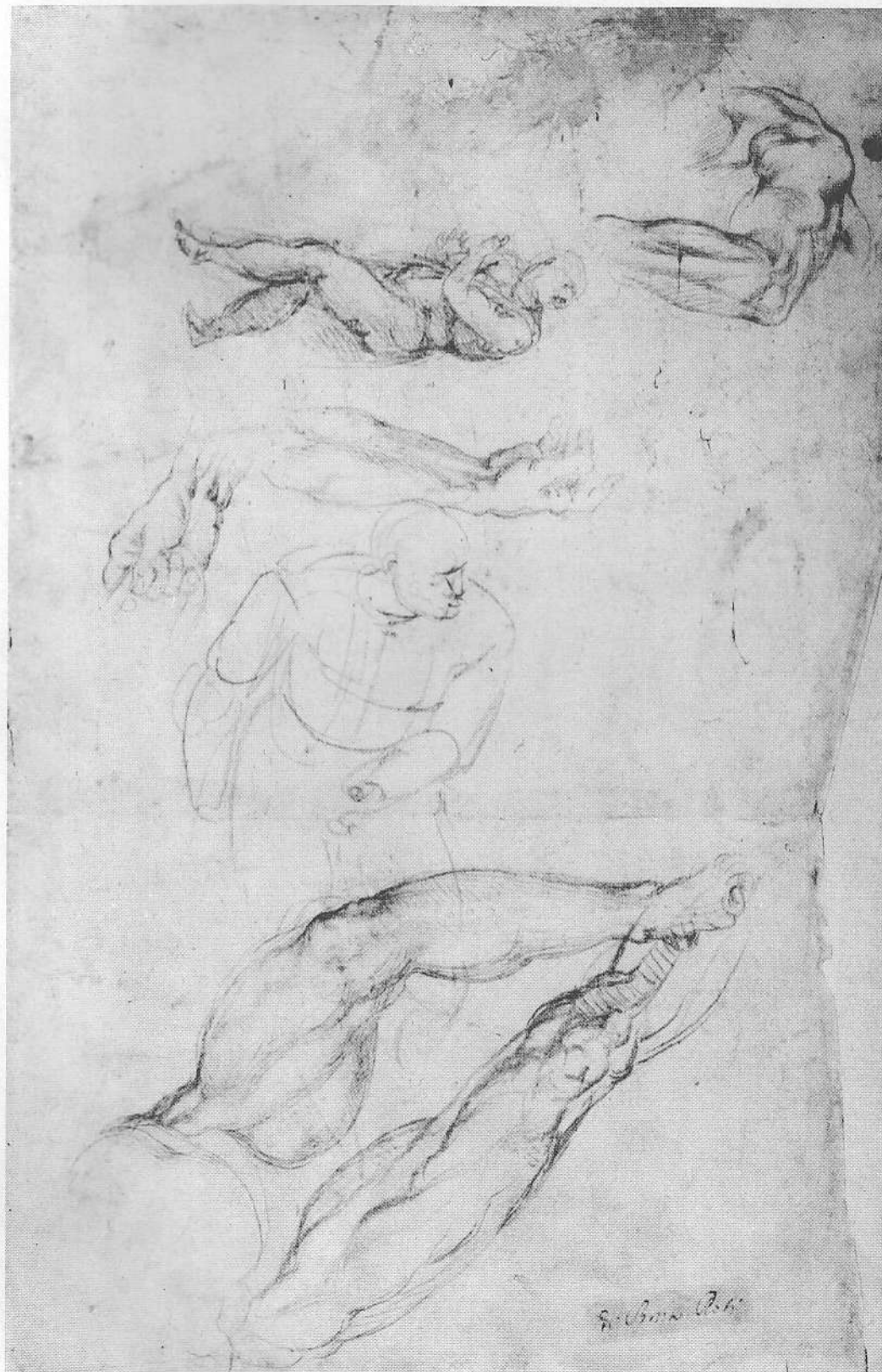
As an aid to positioning the parts of the hand, it's helpful to simplify the forms first.

STUDIES OF THE RIGHT HAND
AND ARM OF THE DYING SLAVE,
AND OF A LEFT ARM
1505-06, red chalk
14 $\frac{5}{8}$ " \times 11 $\frac{3}{4}$ " (37.15 \times 29.85 cm)
Damaged



CHAPTER SIX

THE LOWER LIMB



STUDIES AND SKETCHES
FOR THE LAST JUDGEMENT
1534-35, black chalk
11" x 16½" (27.94 x 41.91 cm)
Damaged

The Front of the Thigh

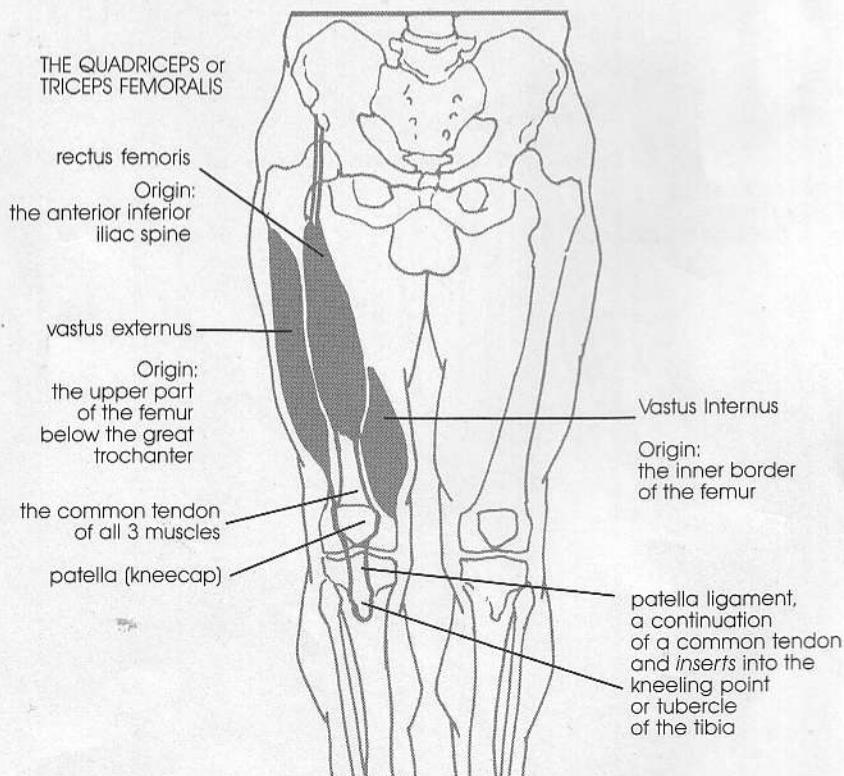
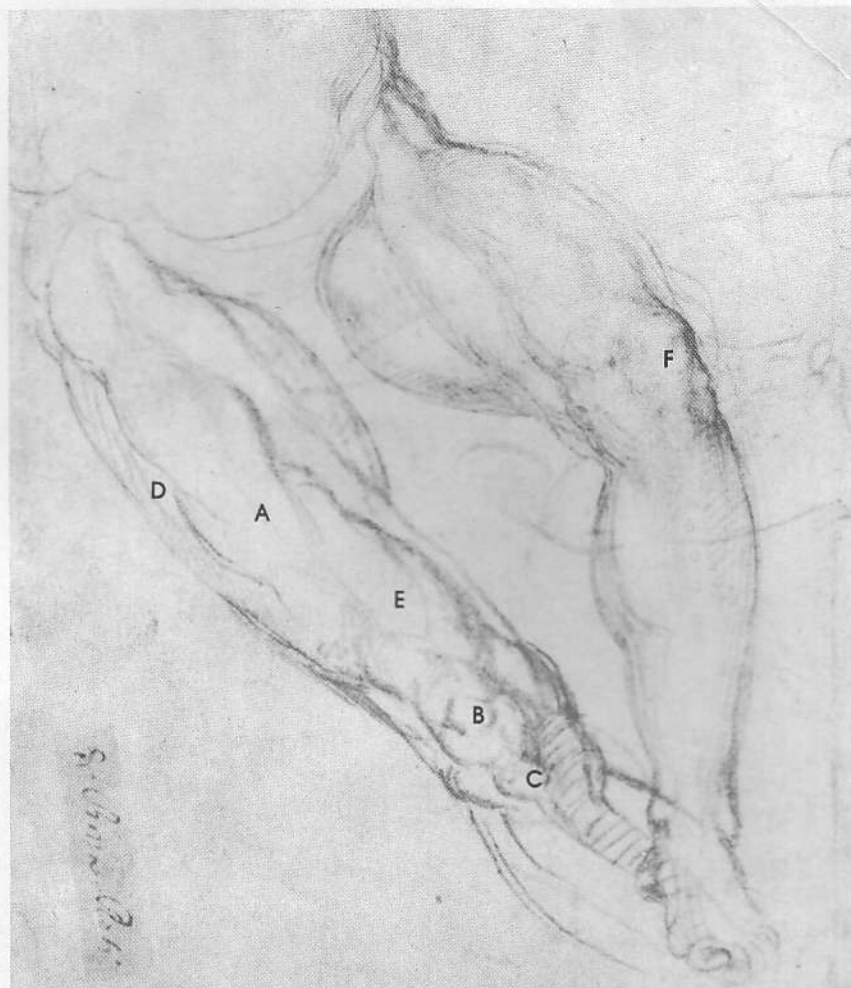
On the front of the thigh is a large mass of extensor muscles called the quadriceps femoris. It is made up of four muscles: the rectus femoris, the vastus externus, the vastus internus, and the vastus intermedius.

The rectus femoris (A) occupies the middle portion of the mass. It originates as a strong tendon from the lower iliac spine of the pelvis and terminates a short distance above the knee into the top of the common tendon of the quadriceps femoris which is common to all the muscles of this group. The kneecap (B), or patella, is embedded in this tendon. Roughly triangular with a convex surface, it protects the front of the knee. The common tendon continues downward as the patella ligament, crossing the knee joint to insert into the kneeling point, or tubercle of the tibia (C).

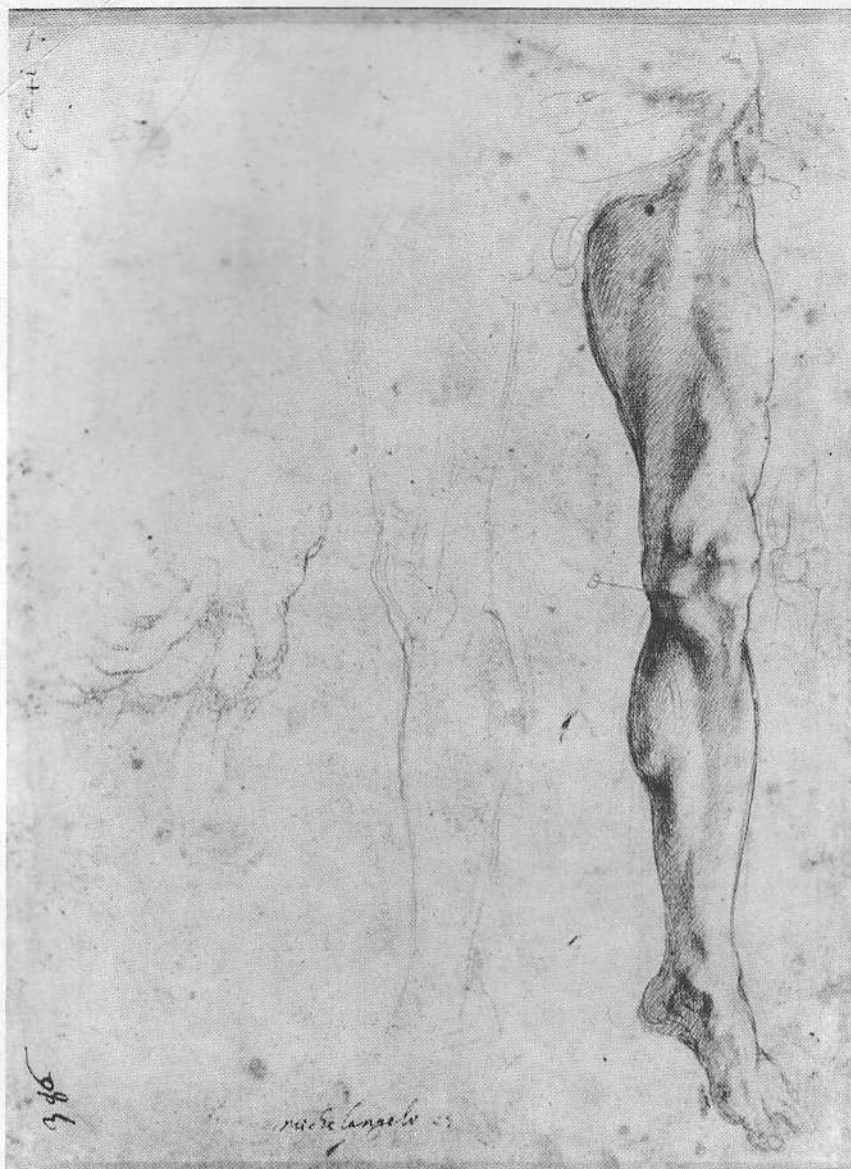
The vastus externus muscle (D) is located on the outside of the thigh. It arises from the upper part of the shaft of the femur, near the bottom of the greater trochanter, and inserts into the outer edge of the common tendon. It extends around to the front of the leg, where it runs parallel to the rectus femoris, and to the back, where it meets the first muscle on the back of the thigh.

The vastus internus (E) arises from the inner side of the shaft of the femur and inserts into the inner edge of the common tendon and patella. When viewed from the front, the inner contour line representing the vastus internus appears to curve into the top of the knee more boldly and at a lower level than does the outer contour line of the vastus externus, which curves gradually into the knee area. The fourth muscle of this group, vastus intermedius, is deep underneath the vastus externus muscle and therefore it is not a major form on the surface for artists. Consequently, artists often refer to the large muscles that do appear on the surface as the triceps of the thigh.

Acting together, the muscles on the front of the thigh open the knee joint, which permits the extension of the lower leg. The rectus femoris has the additional function of flexing the thigh to the trunk of the body, because its origin is up on the pelvis and it crosses a second joint, that of the hip. When the knee (F) is bent, the quadriceps lose some of their distinct shapes at the top of the knee; in this position the muscles are stretched out, and the condyles of the lower end of the femur become much more prominent.



The Muscles That Move the Thigh



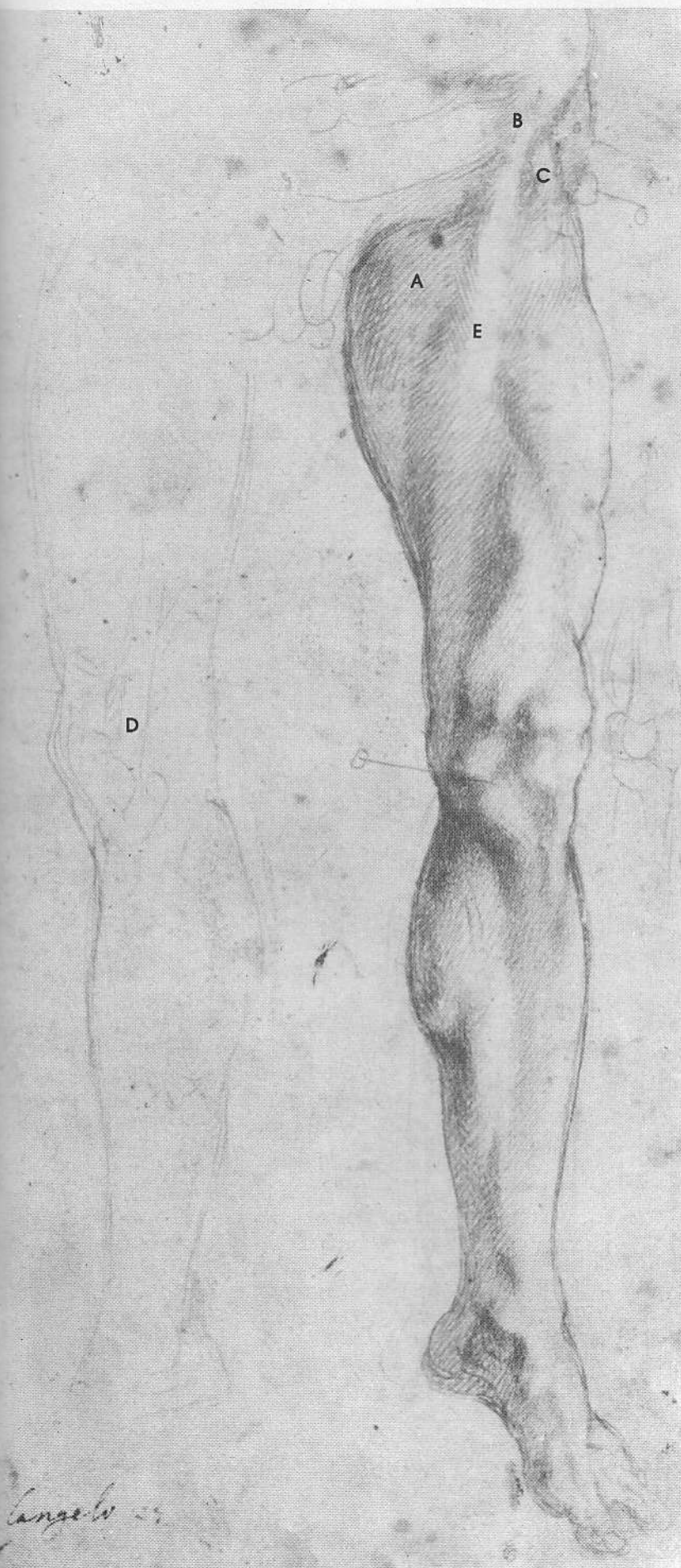
STUDIES OF A LEFT LEG
1504, red chalk
8 $\frac{3}{8}$ " \times 11 $\frac{1}{8}$ " (21.27 \times 28.26 cm)

On the inside of the upper part of the thigh is a triangular-shaped mass (A). The adductor mass originates at the pelvis and terminates in the inner side of the shaft of the femur. The lower portion of this mass is covered by the quadriceps femoris muscles. The adductor mass is bound from above by the fold of the groin and the abdominal muscle. The adductors pull the thigh back toward the body from a position of abduction, in which the thigh is away from the body.

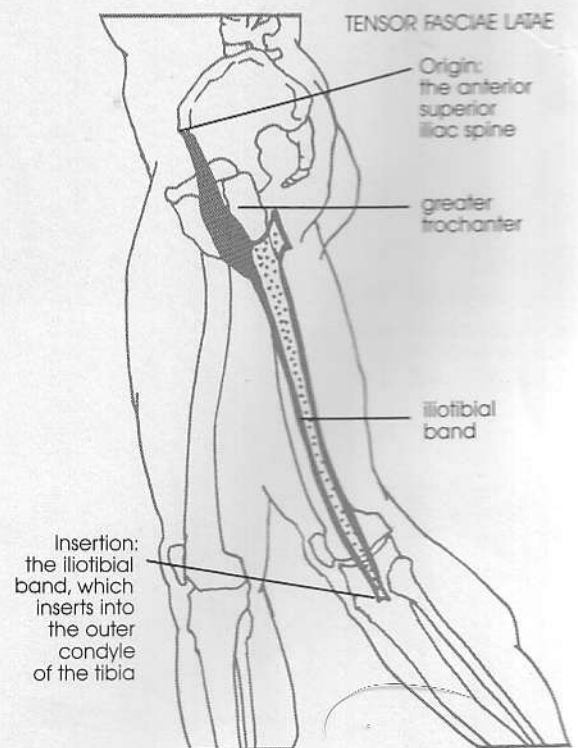
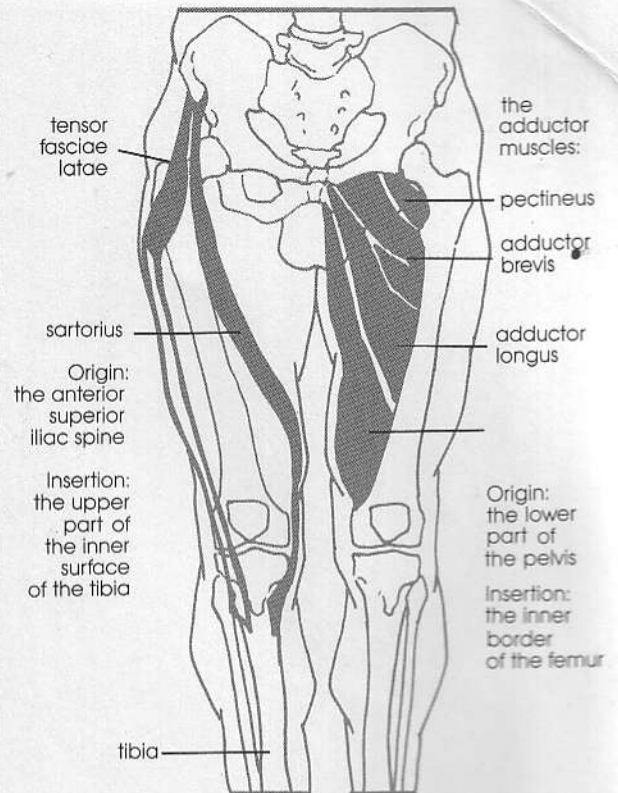
Two other important smaller muscles on the thigh are the tensor fasciae latae and the sartorius. The tensor fasciae latae (C), which originates principally at the pelvic point (B), or anterior superior iliac spine, appears as a small mass just in front of the greater trochanter of the femur. Just below the greater trochanter, the muscle extends into the iliotibial band (D), a long band of fibers on the outside of the thigh called the fascia lata. This band passes over and holds down the vastus externus. Crossing the outside of the knee joint, the band terminates at the outer condyle of the tibia. Generally the iliotibial band is not visible on the outside of the thigh, but when the tensor muscle contracts, the iliotibial band causes a slight ridge on the outside of the knee and a very shallow groove on the vastus externus muscle.

The sartorius muscle (E) also originates at the anterior superior iliac spine. It extends downward across the inside of the thigh and sweeps around to the inner side of the knee, where it terminates near the upper part of the inner surface of the tibia. The sartorius is only about two fingers wide, but it is the longest muscle of the body. It spirals down the inside of the thigh in a beautiful curve that separates the quadriceps on the front of the thigh from the adductor mass on the inside of the thigh. The sartorius is known as the "tailor's muscle" because in the past tailors sat crosslegged on top of large work tables. In that position the sartorius is clearly contracted.

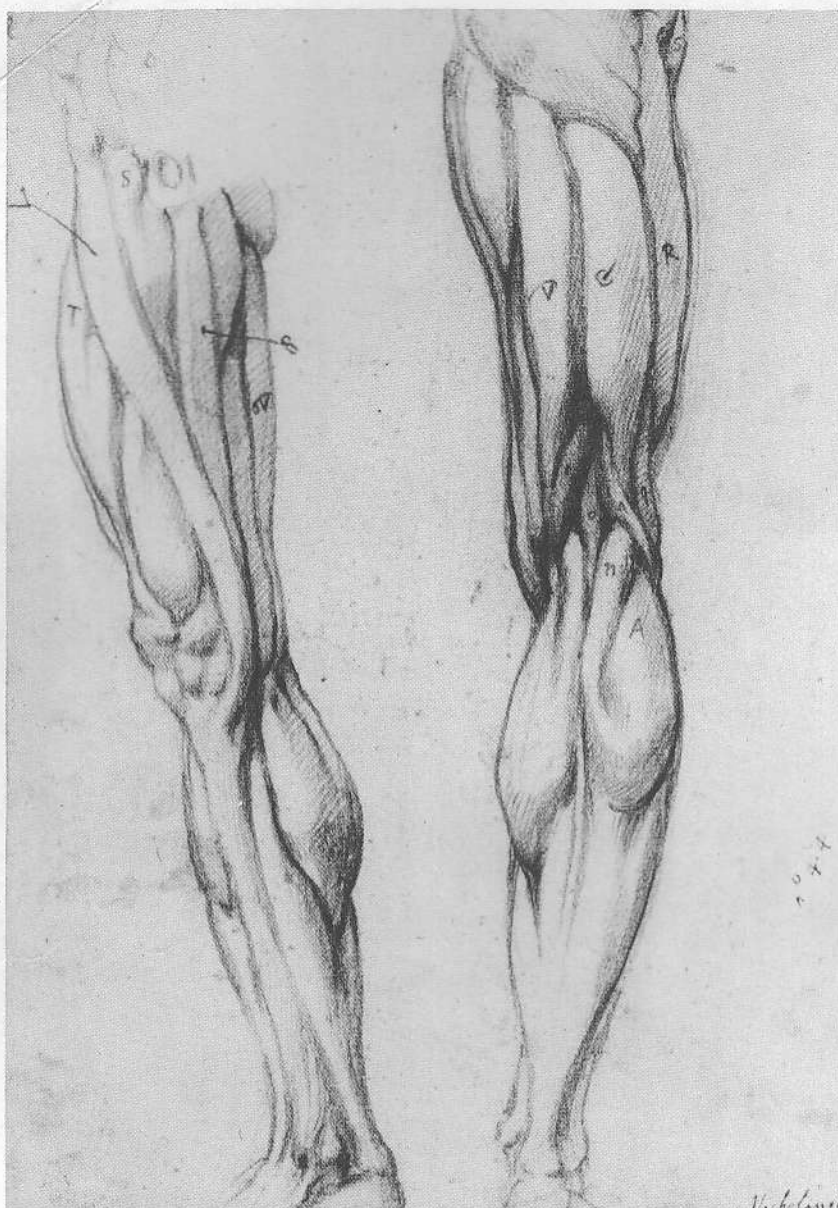
The sartorius muscle and the tensor fasciae latae work against each other; the tensor rotates the leg inward, toward the body (medially), and the sartorius rotates it outward, away from the body (laterally). When both muscles act together, they help lift the thigh upward, toward the trunk.



MUSCLES OF THE THIGH



The Hamstring Muscles



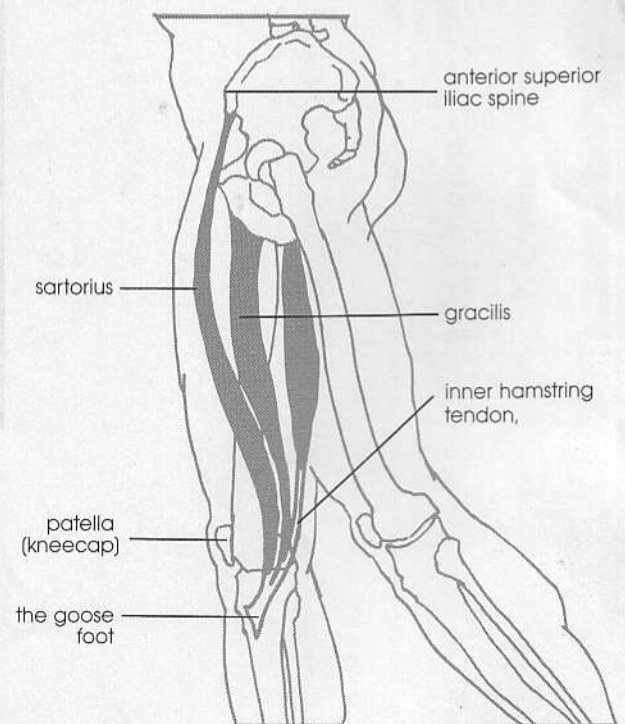
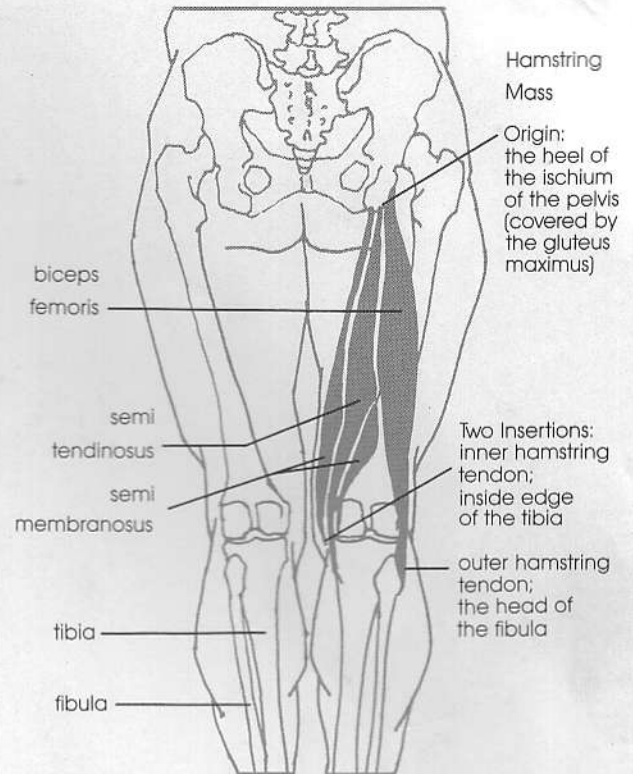
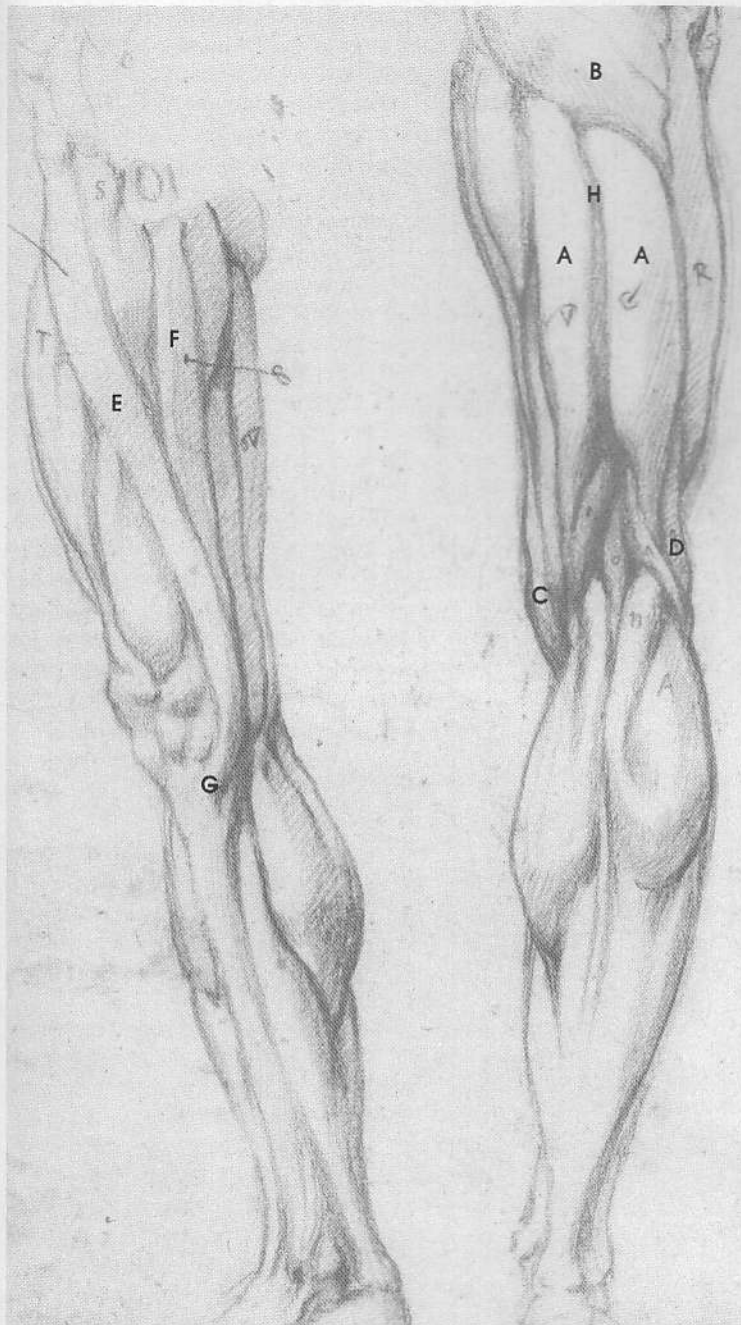
TWO STUDIES OF A STRAIGHT LEG,
FROM THE INSIDE AND THE BACK
11" x 8" (27.94 x 20.32 cm)

On the back of the thigh is the hamstring mass, or posterior femoral muscles, A in the right-hand drawing, which is made up of three muscles: the biceps femoris, the semitendinosus, and the semimembranosus. This mass of flexor muscles originates on the back of the pelvis, or the heel of the ischium, beneath the gluteus maximus (B). The two tendons of the hamstring muscles branch out across the back of the knee. The inner hamstring tendon (C) crosses the knee and inserts into the inside edge of the tibia just below the knee. The outer hamstring tendon (D) crosses the outside of the knee joint and inserts into the head of the fibula. In its entirety the hamstring mass is shaped very much like a football. Its function is to bend the knee, thus flexing the lower leg on the thigh.

The drawing on the left provides an excellent opportunity to observe the spiral quality of the sartorius muscle (E). It also shows the gracilis (F), an adductor muscle located directly behind the sartorius. The gracilis (meaning "slender" in Latin) arises from the lower part of the pelvis, at a point near the meeting of the two pubic bones. This muscle, which defines the inside contour of the thigh, extends downward; along with the sartorius and the inner hamstring tendon it inserts into the inner surface of the tibia at a point just below the knee. The tendons of these three muscles sweep around the inside of the knee, where they form the spiral mass known as the "goose foot" (G).

Because the hamstring tendons are very short, it is difficult to lift the thigh when the knee is unbent. If the knee bends, the hamstring tendons are released and it is then easy to raise the thigh toward the trunk. Try it!

In these anatomical drawings of the leg, Michelangelo carefully delineated the forms. When drawing from life, however, he did not see or draw many of the muscles individually; instead he drew them as masses. In a life drawing, the hamstring mass would appear on the back of the thigh not as three muscles but as one mass. In the right-hand drawing notice the line (H) running vertically down the center of the hamstrings. This separation does not exist on most models. If two or more muscles have the same function, the separation between the muscles will not be indicated at all in a drawing or will be indicated only slightly by lines or shading. If two or more muscles have different functions, the separation between them will be indicated by strong lines or shading.



The Relationship of the Thigh to the Pelvis



In this drawing you can clearly observe the relationship of the muscles of the thigh to the muscles of the pelvic areas. The extent of the tensor fasciae latae (A) from the pelvic point (B) downward and backward to the outside of the thigh is clearly visible. The external oblique muscle (C) rests on the crest of the pelvis above the gluteus medius muscle (D).

The greater trochanter (E) of the femur and the forms that surround it are also clearly defined; the tensor fasciae latae muscle (A) forms an egglike mass in front of the greater trochanter, the spherically shaped gluteus medius (D) is above it, and the gluteus maximus (F) forms the rounded, blocklike mass behind it. The vastus externus muscle (G) is separated from the hamstring mass (H) by a series of short lines (I). Remember that this clearly rendered definition of forms indicates that these muscles have separate functions.

The line representing the front of the thigh and knee beautifully explains the anatomy; note the rectus femoris (J), the vastus externus (K), the common tendon (L), and the patella (M).

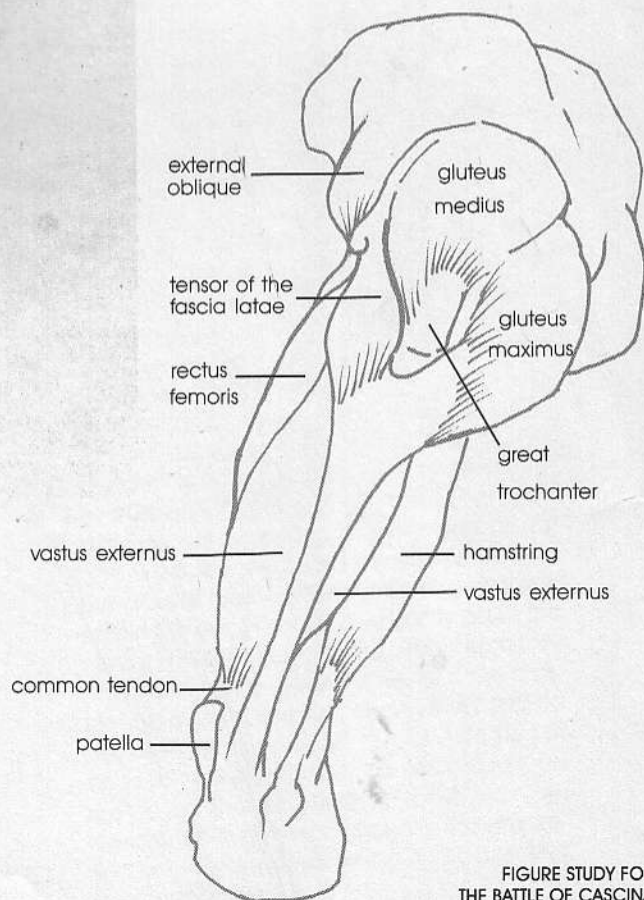
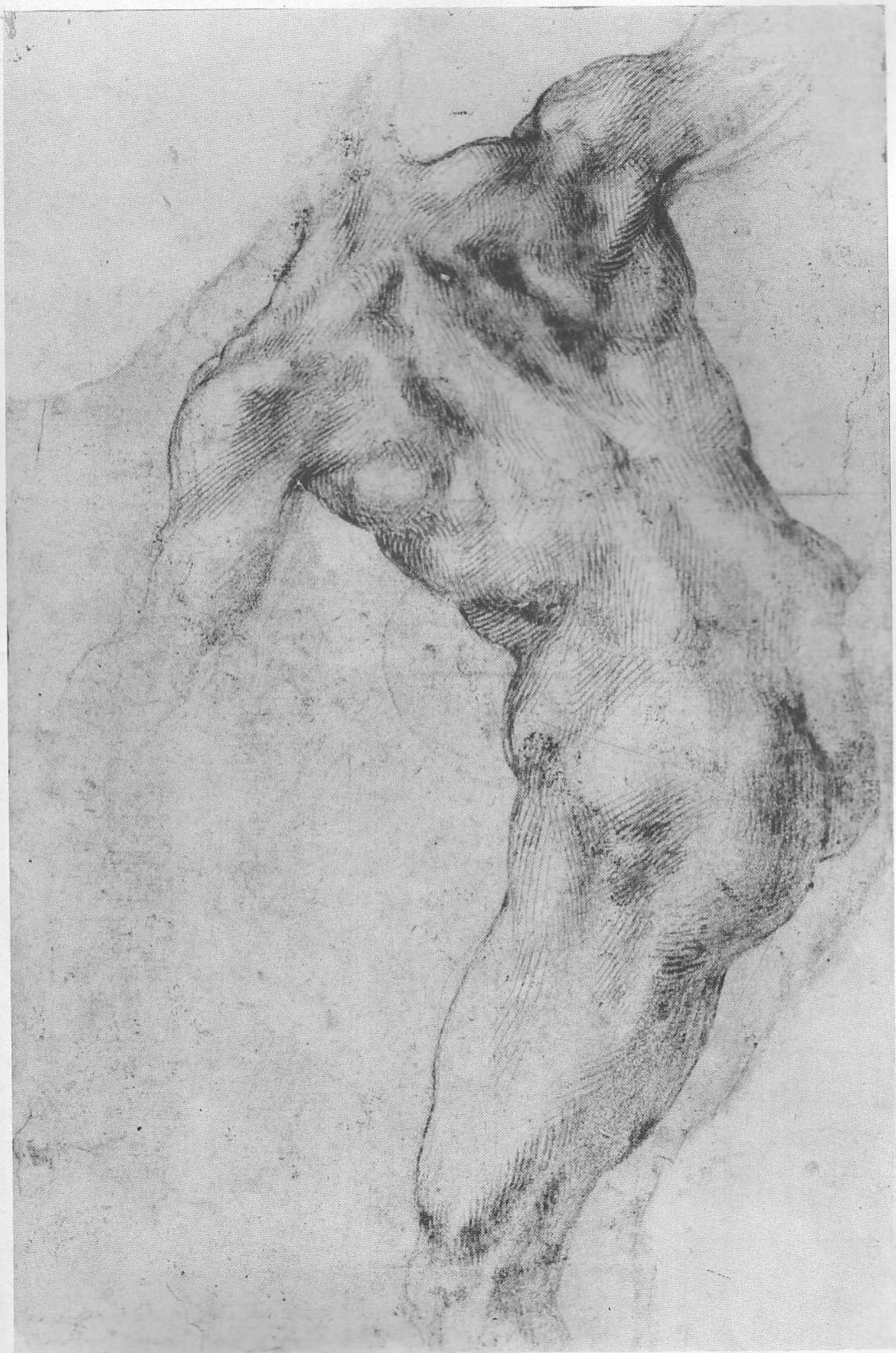
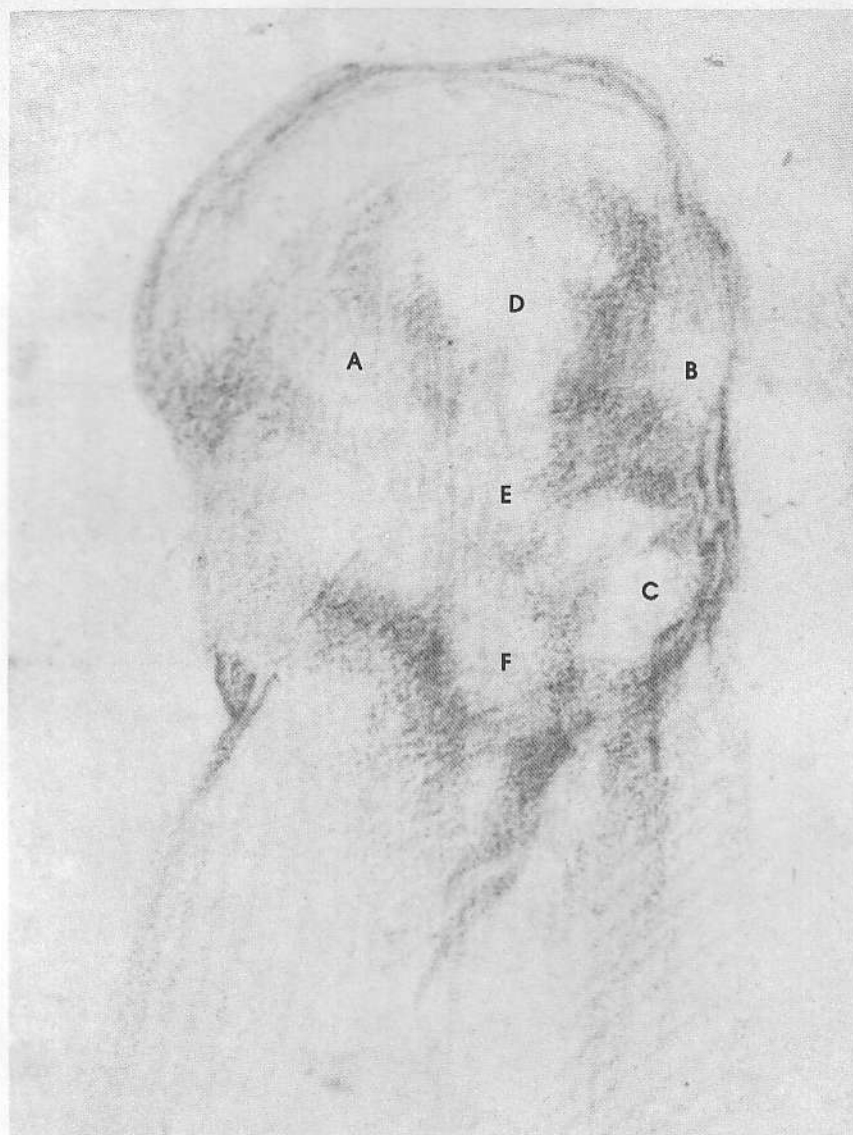


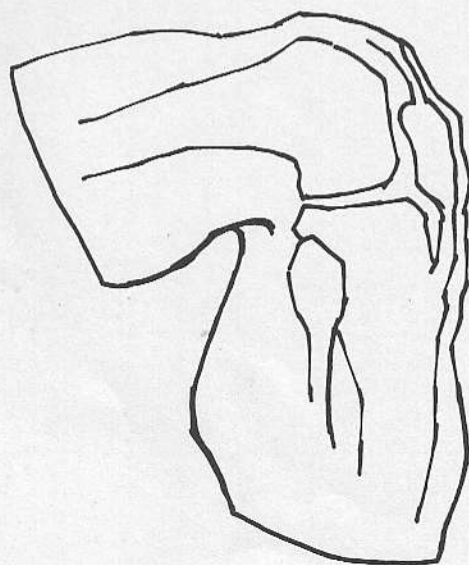
FIGURE STUDY FOR
 THE BATTLE OF CASCINA
 1504, pen over black chalk
 10 1/4" x 6 7/8" (26.04 x 17.46 cm)
 Damaged by dampness



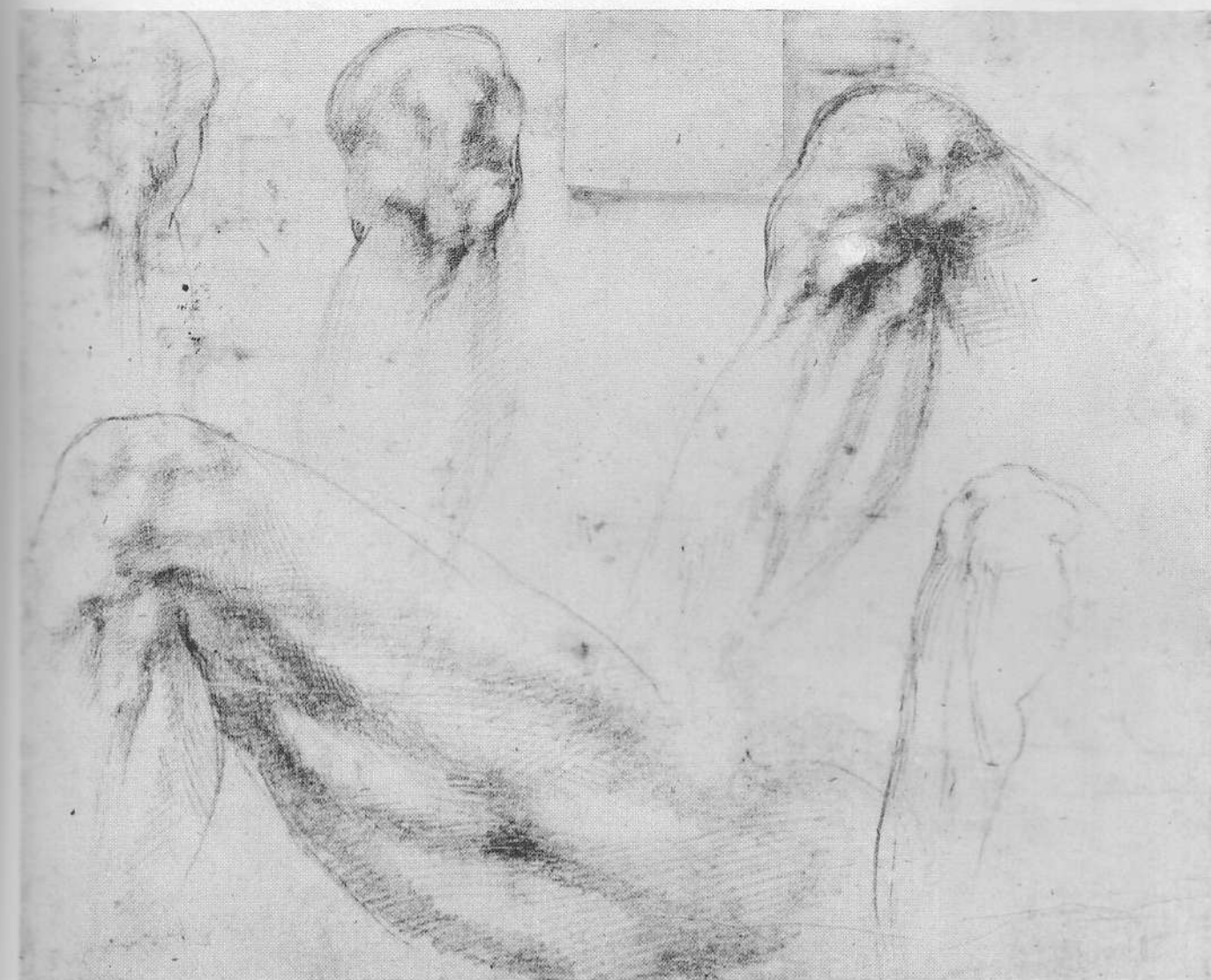
The Bones of the Knee



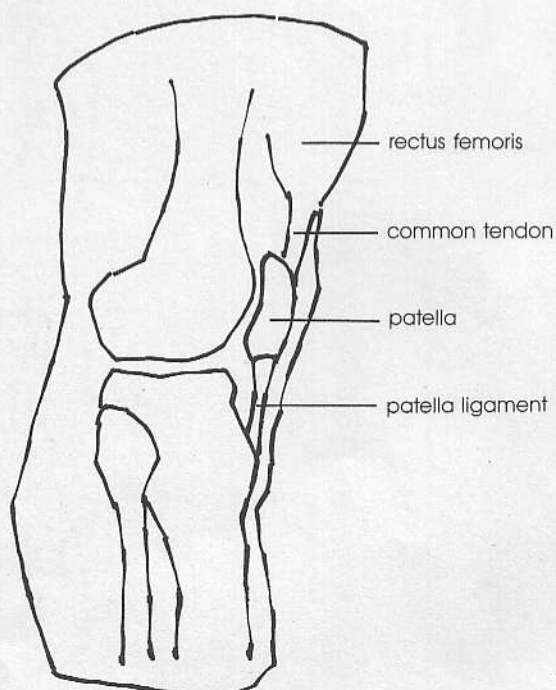
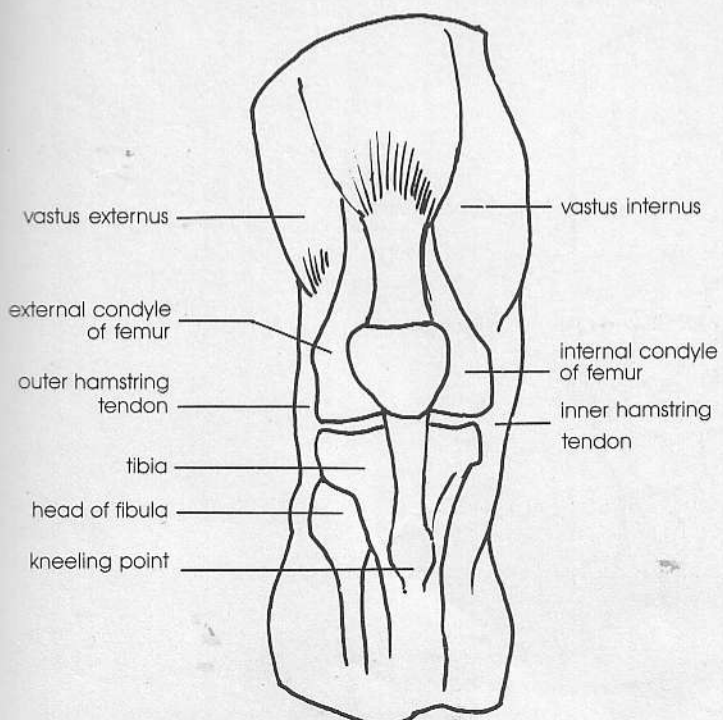
The knee is one of the areas of the body where the bone is close to the surface and strongly influences its form. Although the knee has many components, they all make sense in terms of its function as a compound joint. The lower end of the femur widens into two projections of bone: the inner condyle (A) and the outer condyle (B). These condyles rest on the top, or platform, of the tibia (C). The patella, or kneecap (D), has already been described as a small, roughly triangular bone with a convex surface embedded into the large common tendon of the quadriceps, which crosses the front of the knee. The patella lies in front of the lower end of the femur and forms a projection on the front of the knee; the lower border of this projection is level with the point of separation between the femur and the tibia. The ligament of the patella (E) terminates at the kneeling point, or the tubercle of the tibia (F). The tubercle of the tibia is an unmistakable landmark, which marks the lower border of the knee; it is clearly visible when the leg is viewed in profile.



This diagram of the bent knee shows the relationship of the tibia and femur to the patella.



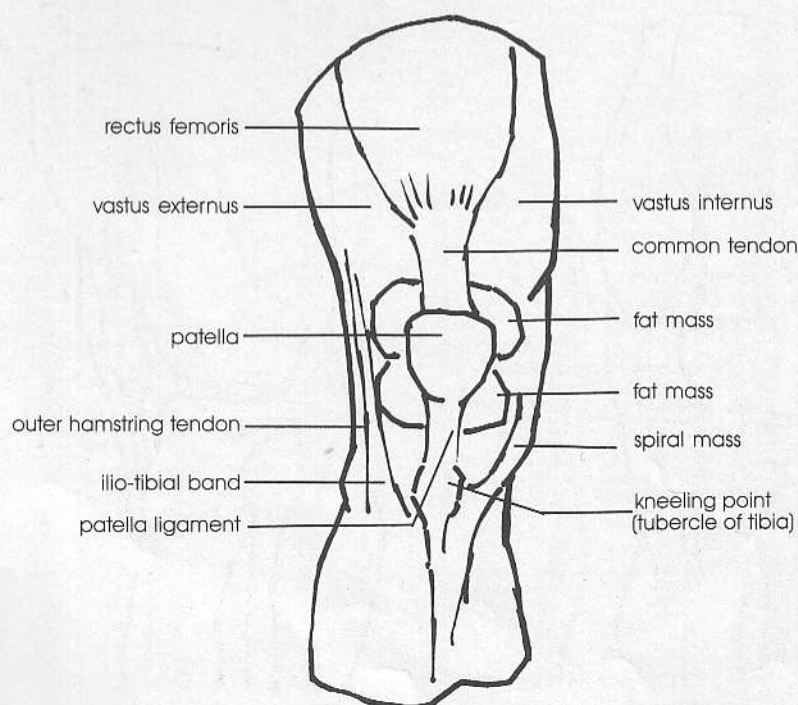
STUDIES FOR THE LEFT LEG OF DAY, 1520-21, black chalk 16 1/8" x 8 1/8" (40.96 x 20.64 cm)

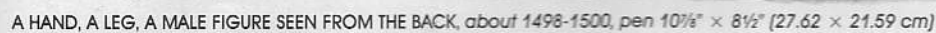


The Forms of the Knee

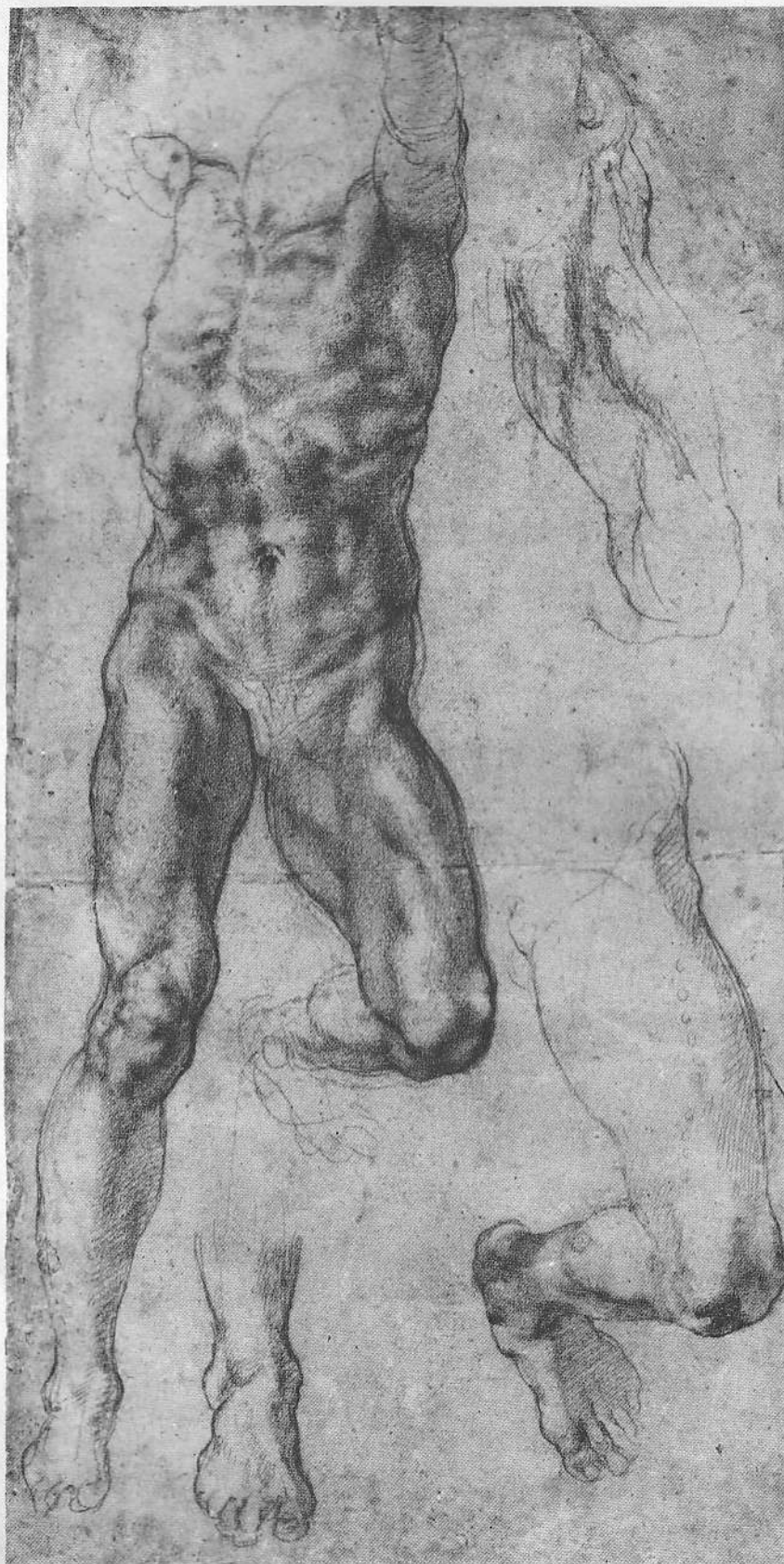


Because the knee is wider in back than in front, some forms of the back of the knee are apparent in this drawing of the front view. The outer hamstring tendon (A) is visible on the outside of the knee. This tendon inserts into the head of the fibula (B). The spiral mass (C), which is made up of the medial hamstring tendon and the tendons of the sartorius and gracilis muscles, sweeps around the inside of the knee, where it terminates on the shaft of the tibia. This spiral mass of tendons curves down toward the front of the leg, while the outer hamstring tendon extends straight down into the head of the fibula on the outer side of the leg. Above and below the patella on the front of the knee are the fat masses (D and E) which are responsible for the great variations that artists encounter when drawing the knee. Everyone's knees are different and the fat masses around the patella can show up as small projecting forms masking the rest of the anatomy of the knee. They are, however, not a great factor on the bent knee as they recede into a hollow created by the bottom of the femur and the top of the tibia.





The Bones and Muscles of the Leg



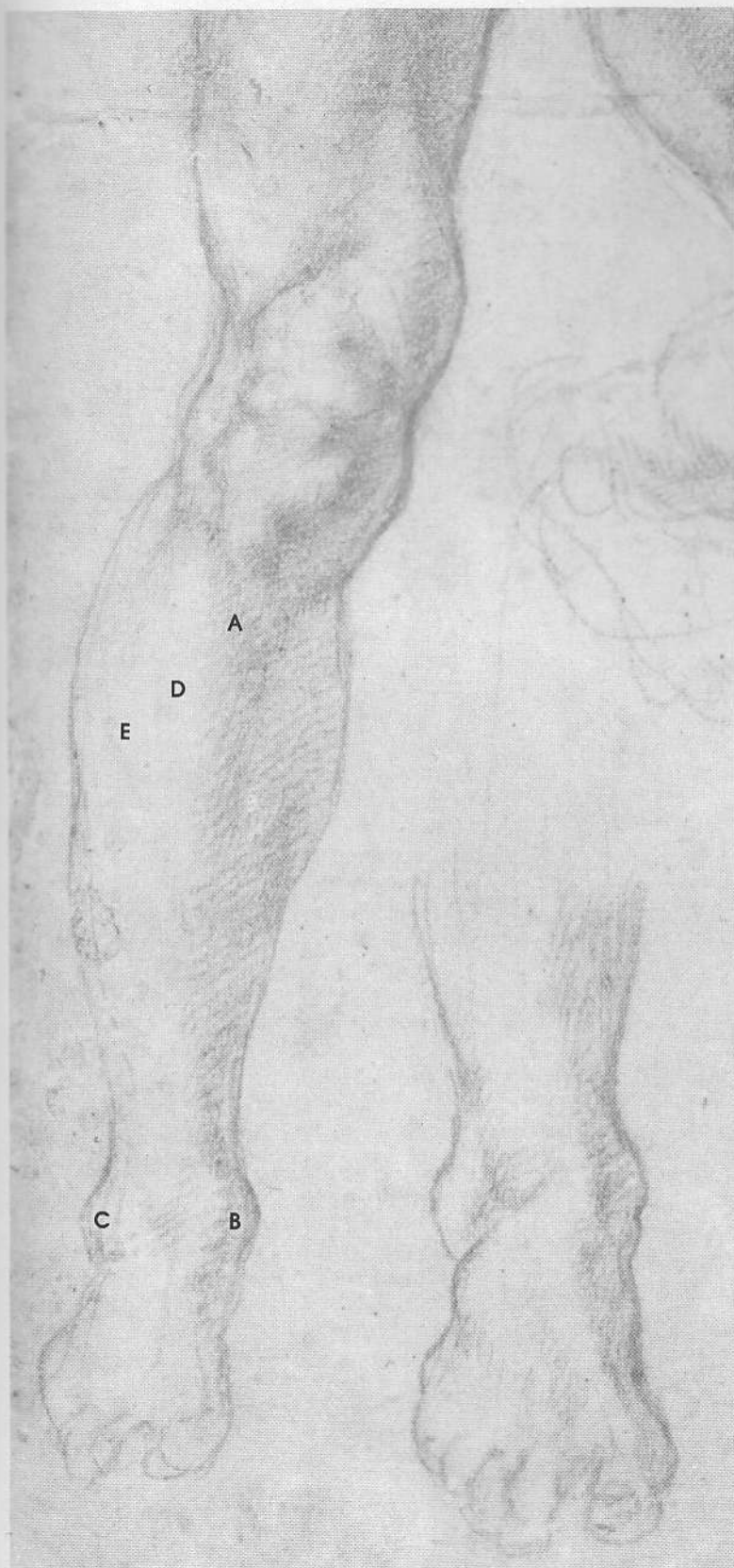
STUDIES FOR THE CRUCIFIED HAMAN
1511, red chalk 16" × 8 1/4" (40.64 × 20.96 cm)
Damaged

Just as there are two bones in the forearm, there are two bones in the lower leg: the larger tibia, located on the inside of the leg, and the smaller fibula, located on the outside. The inner surface of the shaft of the tibia and the sharp anterior crest are entirely on the surface. The curve of the tibia—from the bottom of the knee (A) down to the projection on the inside of the ankle known as the internal malleolus (B)—is clearly visible. The projection on the outside of the ankle, the external malleolus (C), is formed by the lower end of the fibula. (The word malleolus comes from the Latin for "hammer" or "mallet.") The head of the fibula is located on the outside surface of the knee. Only the upper and lower extremities of the fibula are visible on the surface; the shaft underlies the muscles of the leg.

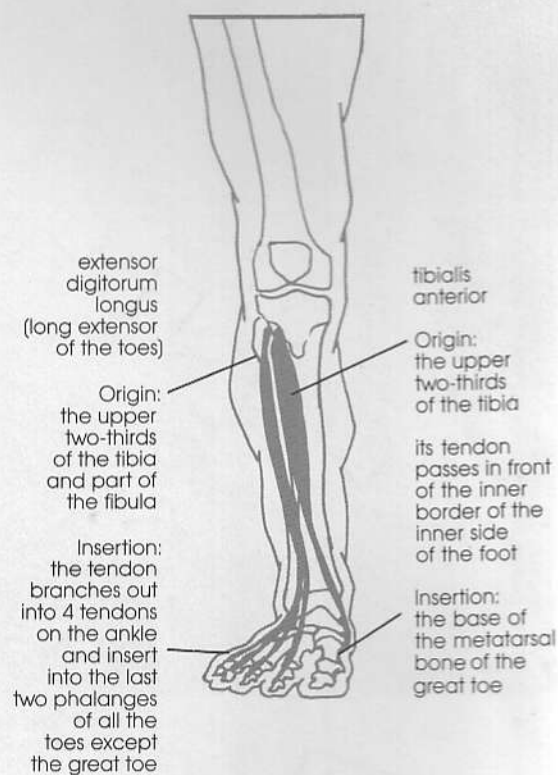
To the outside of the tibia is the tibialis anterior (D), a flexor muscle that originates at the upper two-thirds of the tibia. The tendon of this muscle passes in front of the ankle and disappears on the inner side of the foot, where it passes underneath and inserts into the base of the metatarsal bone of the great toe, the first metatarsal. This tendon is very large and is visible where it crosses the front of the lower leg and ankle. Its function is to bend (flex) the foot toward the leg; when the foot is in this position, the tendon can be most clearly seen.

Directly to the outside of the tibialis anterior is the long extensor of the toes, or extensor digitorum longus (E). This muscle also arises from the upper two-thirds of the tibia and part of the fibula. The tendon of this muscle crosses the front of the ankle, where it divides into four smaller tendons that fan out on the top, back, or dorsum of the foot. These smaller tendons insert into the last phalanges of the second through the fifth toes. As its name implies, the long extensor of the toes extends (uncurls) these toes and helps flex the foot. Both tibialis anterior and the long extensor are massed into one form on the front of the leg.

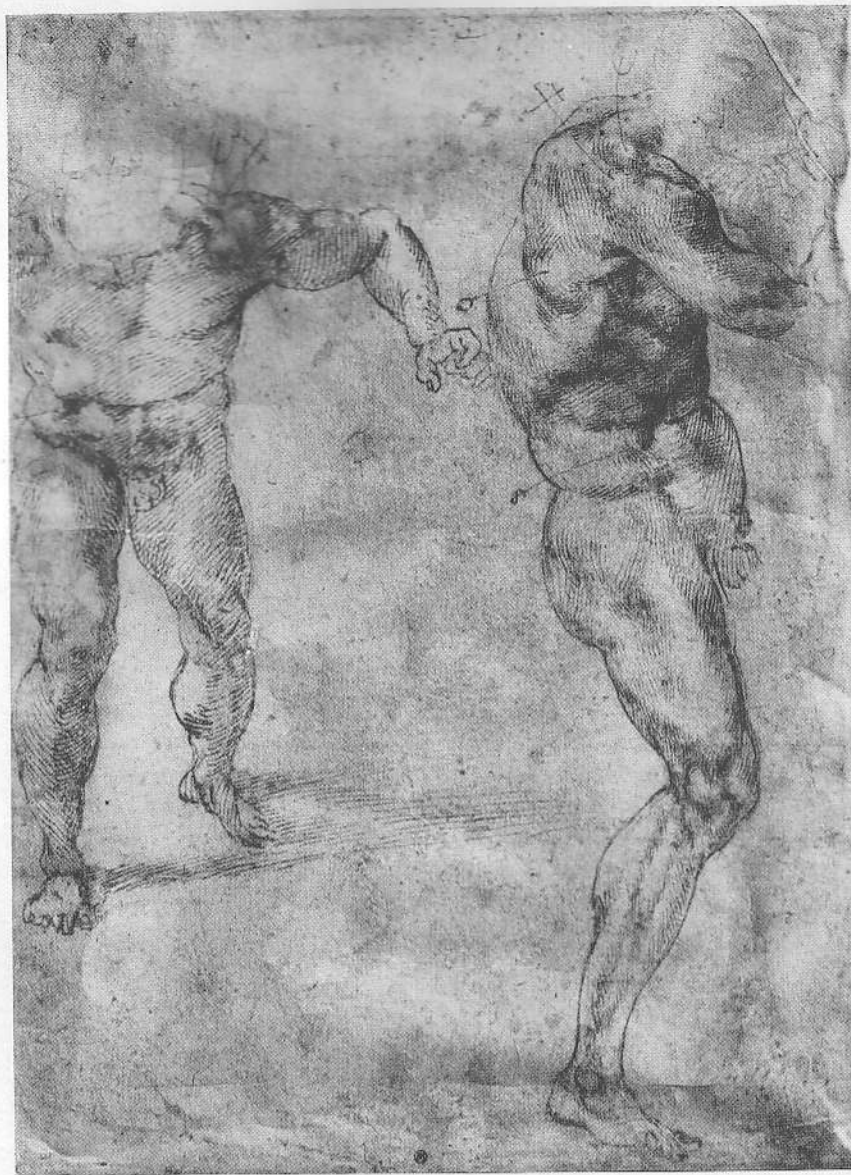
The light in this drawing is from the left front of the figure. Your ability to draw in light and shade greatly improves when you realize that light as it appears on a figure in nature is not necessarily the best light for drawing. Artists usually devise a single light source, since light hitting the figure from different directions tends to break up the forms of the figure, creating a spotted appearance. Thus Michelangelo did not copy lighting as it existed in nature but created his own.



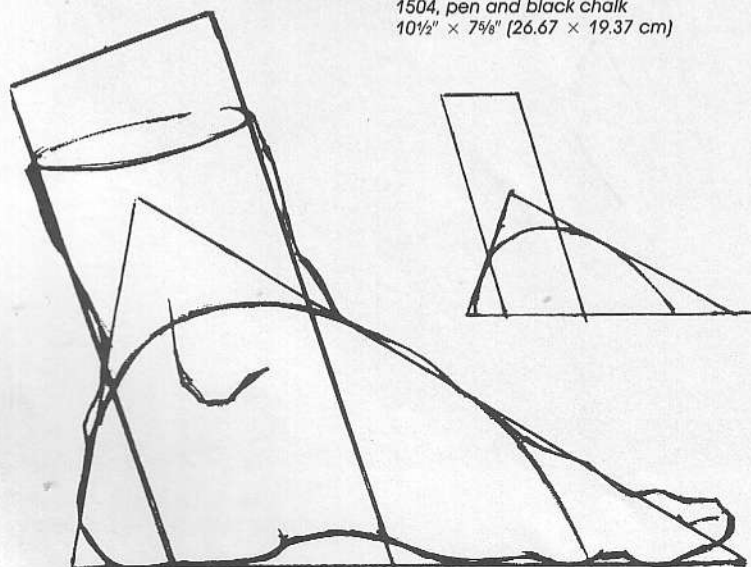
MUSCLES OF THE LOWER LEG



The Muscles of the Fibula



TWO FIGURE STUDIES FOR THE BATTLE OF CASCINA
1504, pen and black chalk
10½" × 7⅞" (26.67 × 19.37 cm)

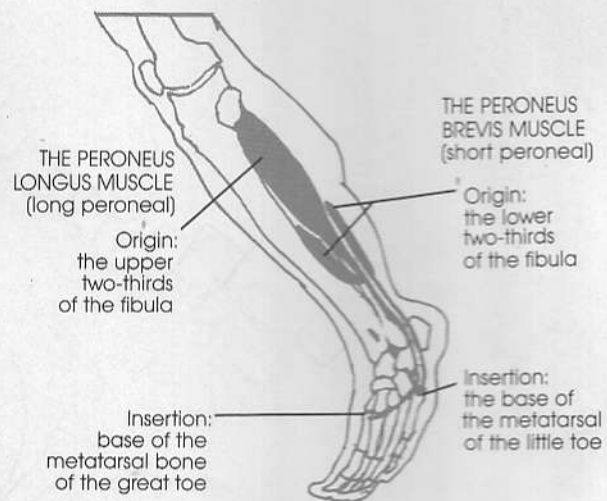
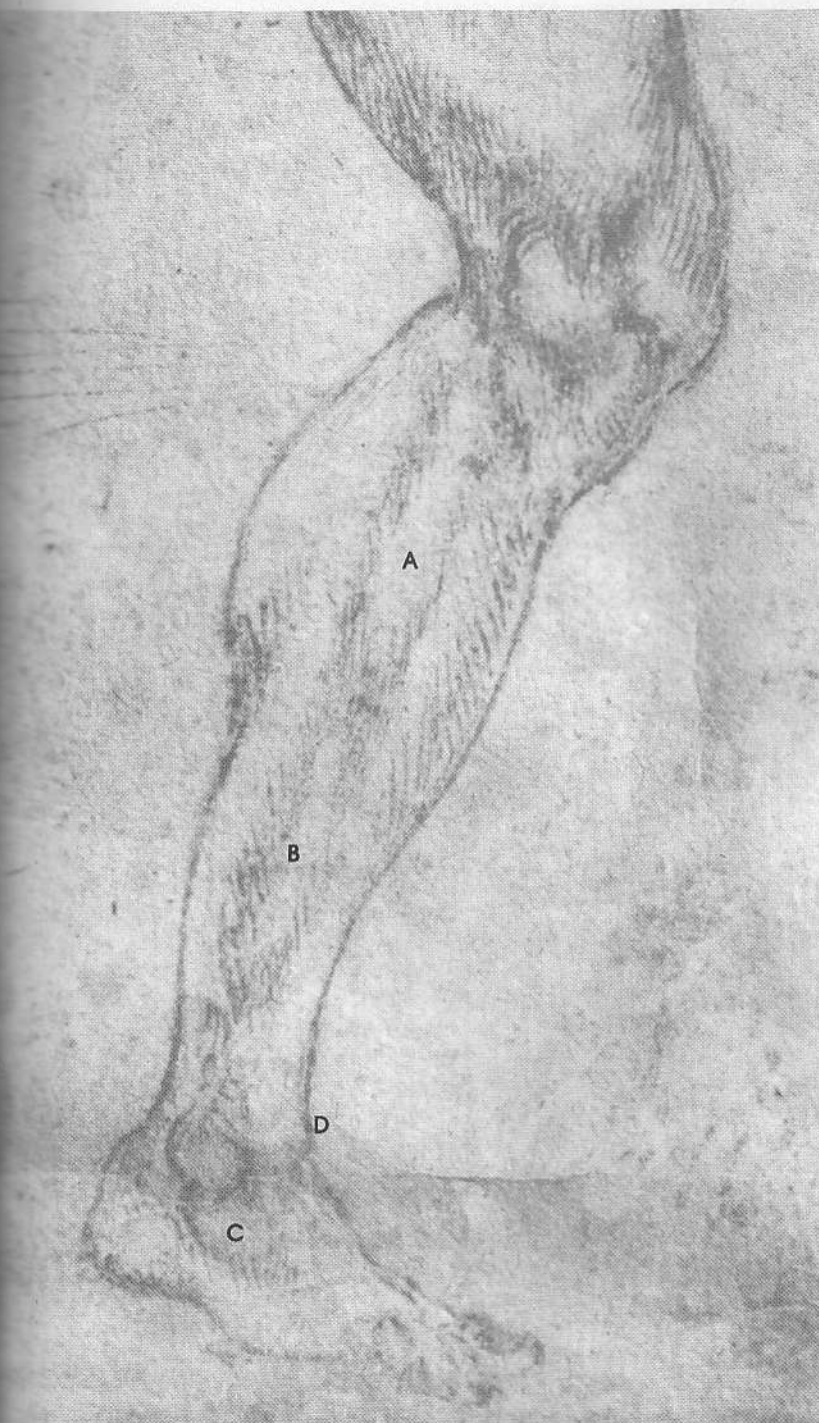


Two peroneal muscles arise from the fibula on the outside of the leg. The word peroneal means "pertains to the fibular." Clearly visible on the outside of the leg is the long peroneal muscle, or peroneus longus, A in the right-hand drawing, which arises from the upper two-thirds of the fibula. The tendon of this muscle passes around the outer malleolus and extends under and across the foot to terminate in the base of the metatarsal of the great toe. Its main function is to extend the foot; however, because of the path of its tendon across the sole of the foot, this muscle also is responsible for turning the sole outward (everting it). The short peroneal muscle, or peroneus brevis (B), arises from the lower two-thirds of the fibula. The tendon of this muscle also passes around the external malleolus, but it inserts into the base of the metatarsal of the little toe, or fifth metatarsal. The middle fibres of this muscle are covered by the tendon of the long peroneal. Together with the long peroneal, the peroneus brevis extends the foot by lifting the heel while pushing the toes down.

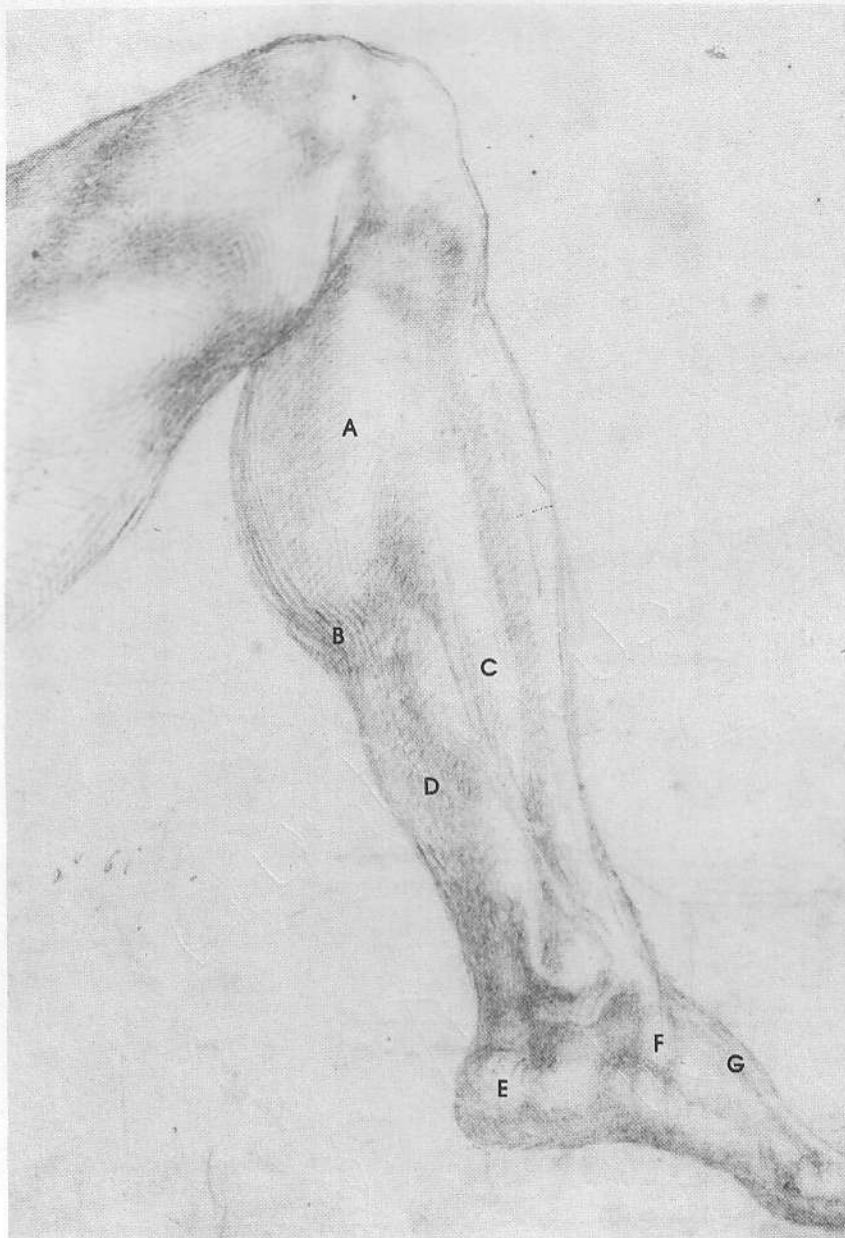
The peroneal muscles are rarely seen or drawn as individual muscles; long and slender, they tend to mass together, forming the general cylindrical shape of the lower leg. When, however, the leg is in a state of great action—for instance, when the entire weight of the body is on the toes—these muscles show up as separate forms on the larger mass of the leg. Michelangelo often decorated the outside of the foot with indications of the tendons of the two peroneal muscles wrapping around the back of the external malleolus.

In this drawing the small mass of the short extensor of the toes, or extensor digitorum brevis (C), is clearly visible. The line running down the front of the leg represents the tibialis anterior; the tendon of this muscle (D) creates a handsome curve on the front of the ankle. Remember that the leg always joins the foot as a curve. Also note that the leg should not appear to enter at the top of the arch of the foot; the actual meeting point is at the back of the arch.

The leg enters the foot at the back part of the arch and not at the top of the arch.



The Muscles of the Calf



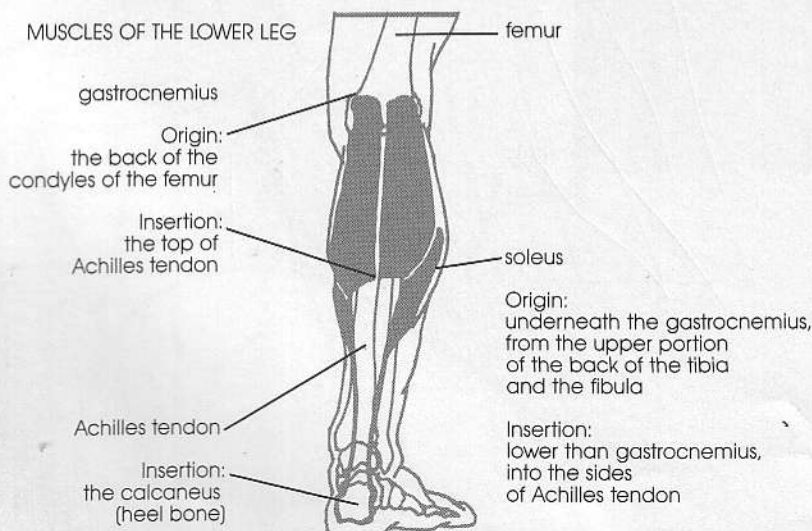
The calf of the leg is made up of two muscles. The gastrocnemius (A) (the name means "frog's belly") is a bulging muscle visible on the surface of the leg. It has two heads, which originate from the back of the condyles of the femur, and it inserts into the top of the Achilles tendon, on the back of the leg. The point at which the fibers of the muscle join that tendon (B) varies from person to person but usually occurs about half way down the back of the leg. If the gastrocnemius is well developed or in a state of contraction, the juncture of the muscle fibers and tendon will be clearly defined. The inner half of the gastrocnemius is on a lower level than is the outer half; the inner half therefore inserts into the Achilles tendon on a level slightly lower than the insertion point of the outer half. The internal malleolus, however, is on the higher level than that of the external malleolus and should be so represented in a drawing.

The soleus (C) (the name means "flatfish") is a flat muscle that lies directly under the gastrocnemius. It originates at the upper portion of the back of the tibia and fibula and inserts into the Achilles tendon well below the gastrocnemius. Except for its lower fibers, the soleus is covered by the more superficial gastrocnemius.

The Achilles tendon (D) is wide at its upper border; it tapers toward the back of the ankle and then widens again as it inserts into the heel bone, or calcaneus (E).

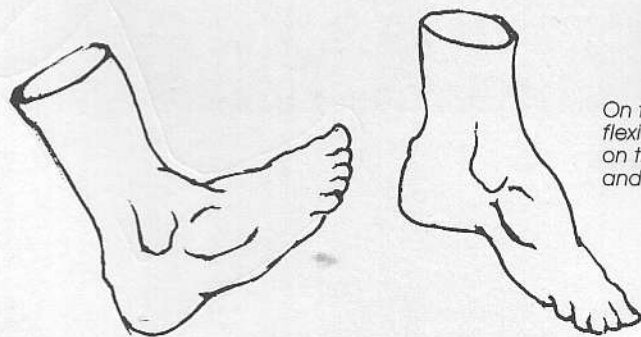
The powerful calf muscles are the extensor muscles of the foot. They enable a person to put the entire weight of the body on the toes.

In this drawing the tendon of the tibialis anterior (F) is clearly visible on the front of the ankle. The dorsum of the foot is defined by the tendon of the extensor of the great toe (G).





STUDIES FOR THE LEFT LEG OF DAY
1520-21, black chalk
16 1/8" x 8 1/8" (40.96 x 20.64 cm)



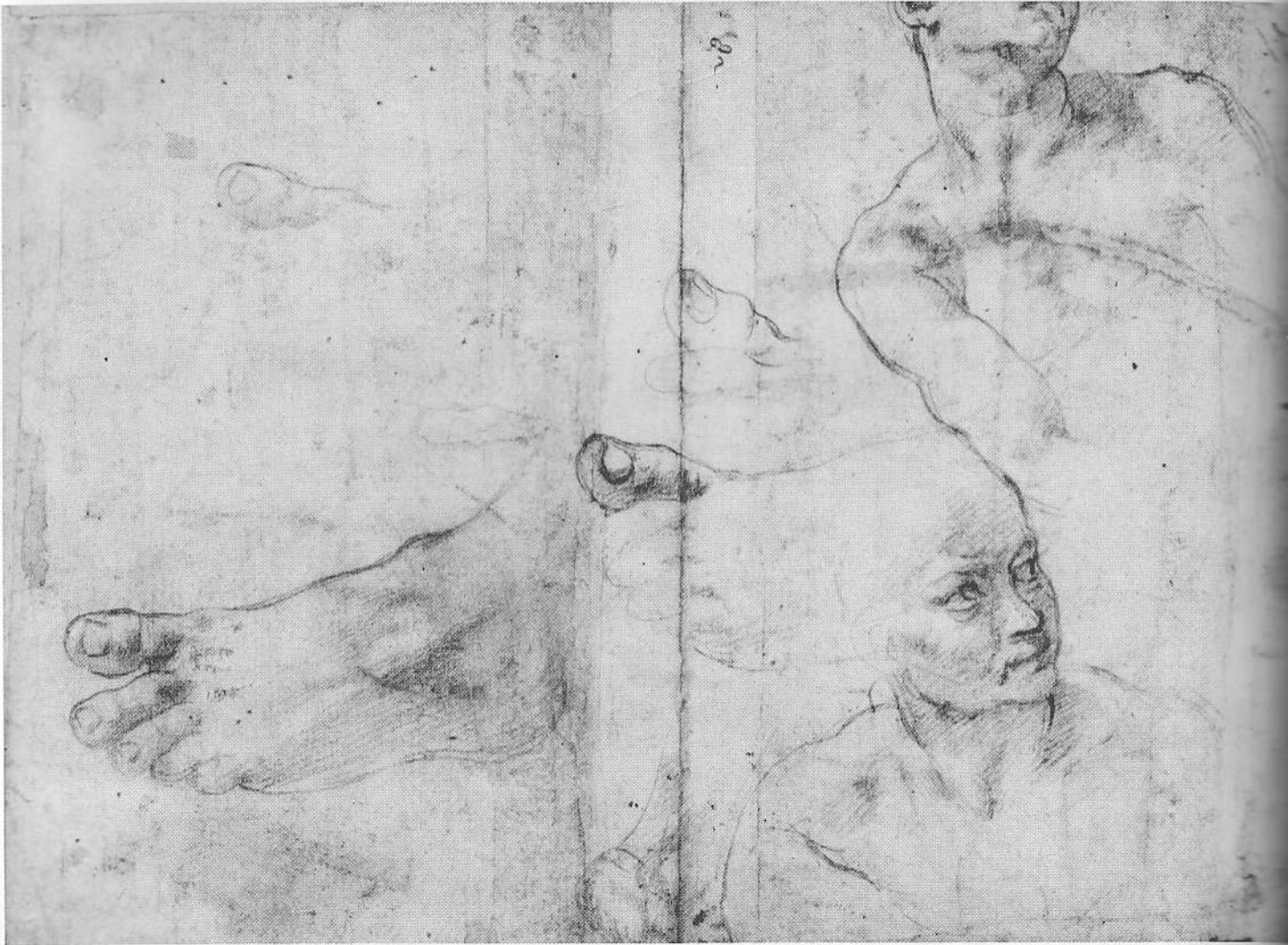
On the left the foot is in a state of flexion and the toes in extension; on the right the foot is in extension and the toes are in flexion.

The Foot: The Bony Arch

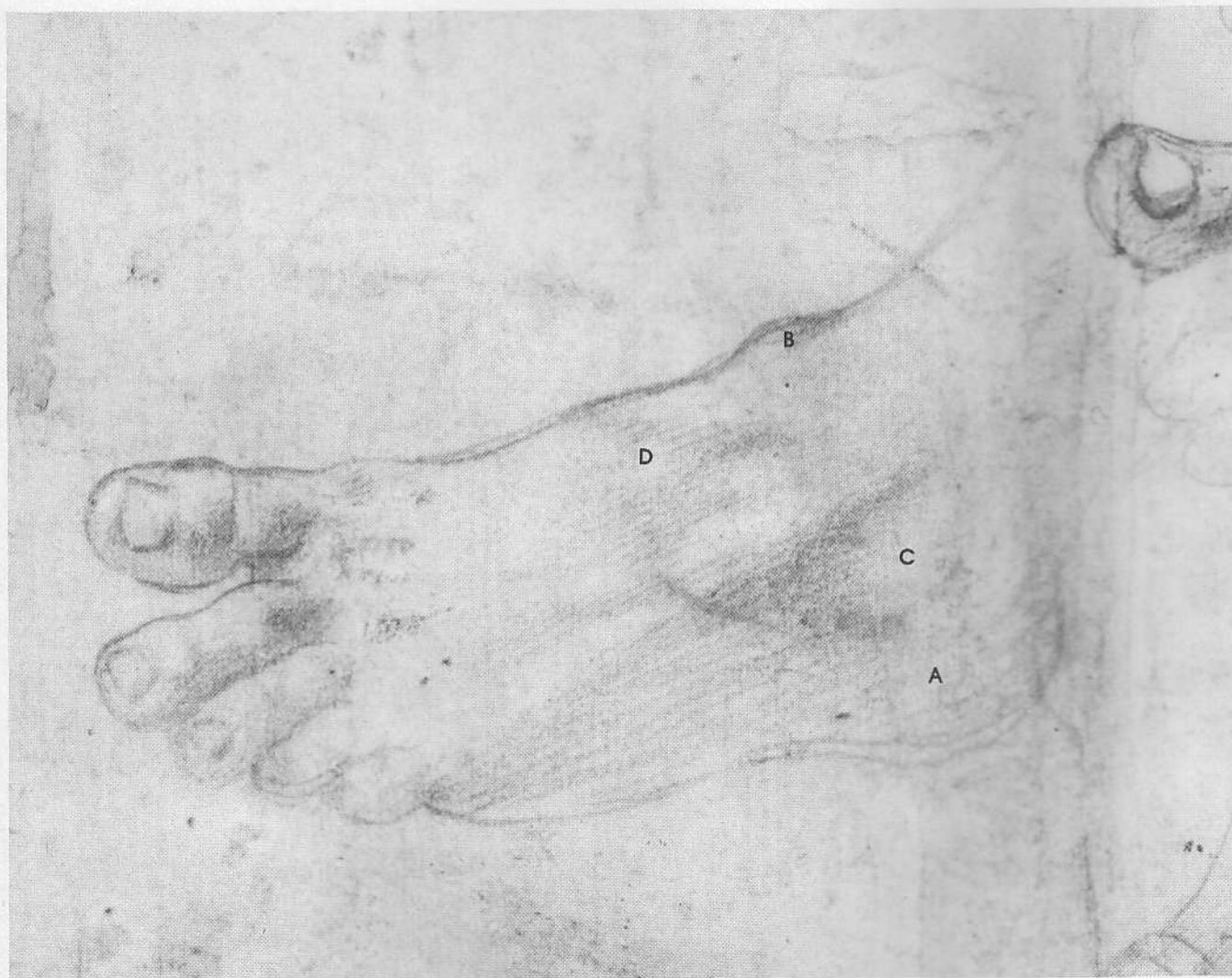
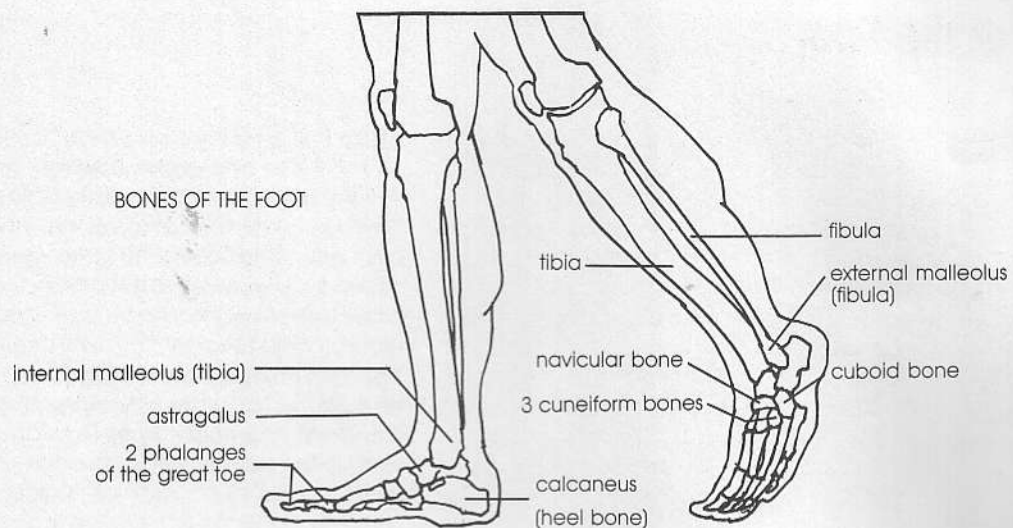
You can learn a great deal about the anatomy of the foot from studying Michelangelo's drawings. The forms of the foot are determined more by skeletal structure than by any other factor. On the dorsum of the foot there is only one small muscle, the short extensor of the toes, and the tendons of the long extensor of the toes and other muscles that are located on the front of the leg. The ankle, the arch, and the heel of the foot are formed by the seven tarsal bones: the calcaneus, the astragalus, the navicular bone, three cuneiform bones, and the cuboid bone. The

calcaneus forms the heel (A), as noted earlier. Above it the astragalus rests in the cavity formed by the lower ends of the tibia (B) and the fibula (C). In this cavity it acts like a hinge joint, which allows the foot to move up (flexion) or down (extension). The navicular bone, three cuneiforms, and the cuboid bone form the arch of the foot at D.

Beyond the tarsal bones are the five metatarsal bones, which form the body of the foot, connecting the tarsus to the toes. Each toe has three phalanges, except for the great toe, which, like the thumb, has only two.



STUDIES FOR AN ANGEL IN THE CREATION
OF SUN AND MOON, THE NUDE AT RIGHT ABOVE DANIEL,
AND THE FIGURE ATTENDING JONAH
1511, red chalk
9 7/8" x 13 1/4" (23.81 x 33.66 cm)
Damaged



The Muscles of the Foot

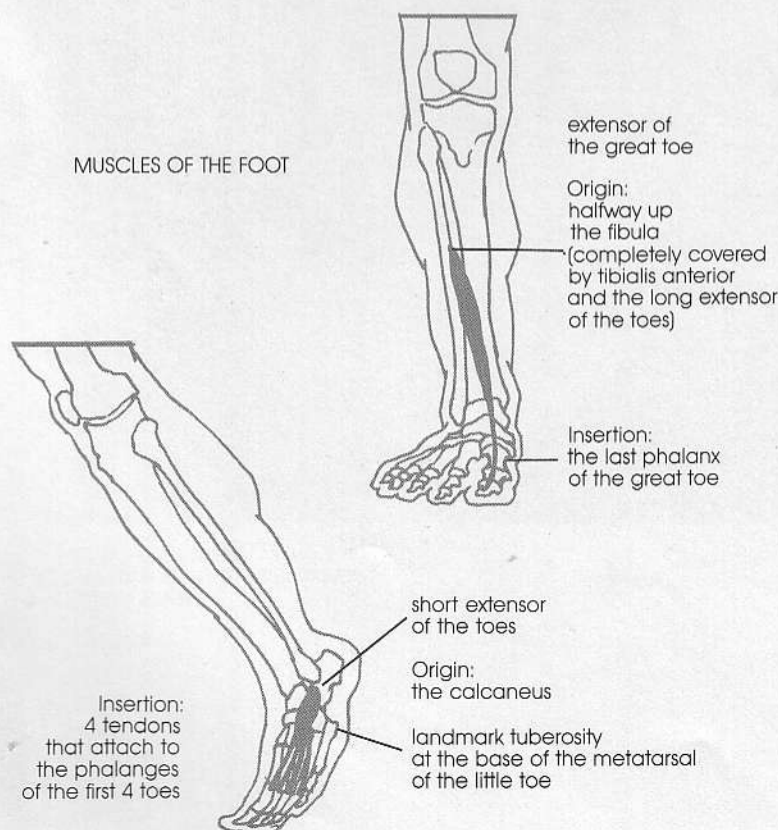


The foot is remarkably similar to the hand. There are differences, however; the great toe is not as mobile as the thumb. Also, unlike the thumb, whose position on the hand differs from that of the fingers, the great toe's position on the foot is not very different from that of the other toes. When the great toe is lifted, a tendon—running straight down the center of the toe—is clearly visible on the dorsum of the foot. This is the tendon (A) of the extensor of the great toe, which arises from about half-way up the shaft of the fibula and terminates in the last (distal) phalanx of the great toe. On the front of the leg, this muscle is completely covered by the more superficial muscles and so is not visible. Its tendon is important to artists because it marks the high point, or ridge, on the dorsum of the foot. In this drawing notice that, from this ridge, Michelangelo has made one plane of the foot seem to slope gradually downward and outward toward the little toe, while the plane of the inside of the foot appears to drop down abruptly. The function of the extensor of the great toe is to extend the great toe by lifting it up toward the front of the leg.

The only muscle on the dorsum of the foot is the short extensor of the toes, as noted earlier, which originates at the heel bone and forms a small egg-shaped mass on the outer side of the foot (B), directly in front of the external malleolus. Four tendons extend from it and insert into the phalanges of the first four toes. These tendons pass under the tendons of the long extensor of the toes and therefore are rarely visible on the foot.

The skeletal arch on the inner side of the foot is filled out and softened by the abductor of the great toe, or abductor hallucis (C). On the farther (distal) end of the metatarsal bone of the great toe is a projection (D) that is an important landmark for the artist. The outside contour of the foot is defined by the abductor of the little toe, or abductor digiti minimi (E) and by a second landmark projection (F), which is caused by the enlarged closer (proximal) end of the metatarsal bone of the little toe. In this drawing, Michelangelo emphasized the powerful tendon of the tibialis anterior muscle (G) as it crosses the ankle joint to terminate in the inside border of the foot.

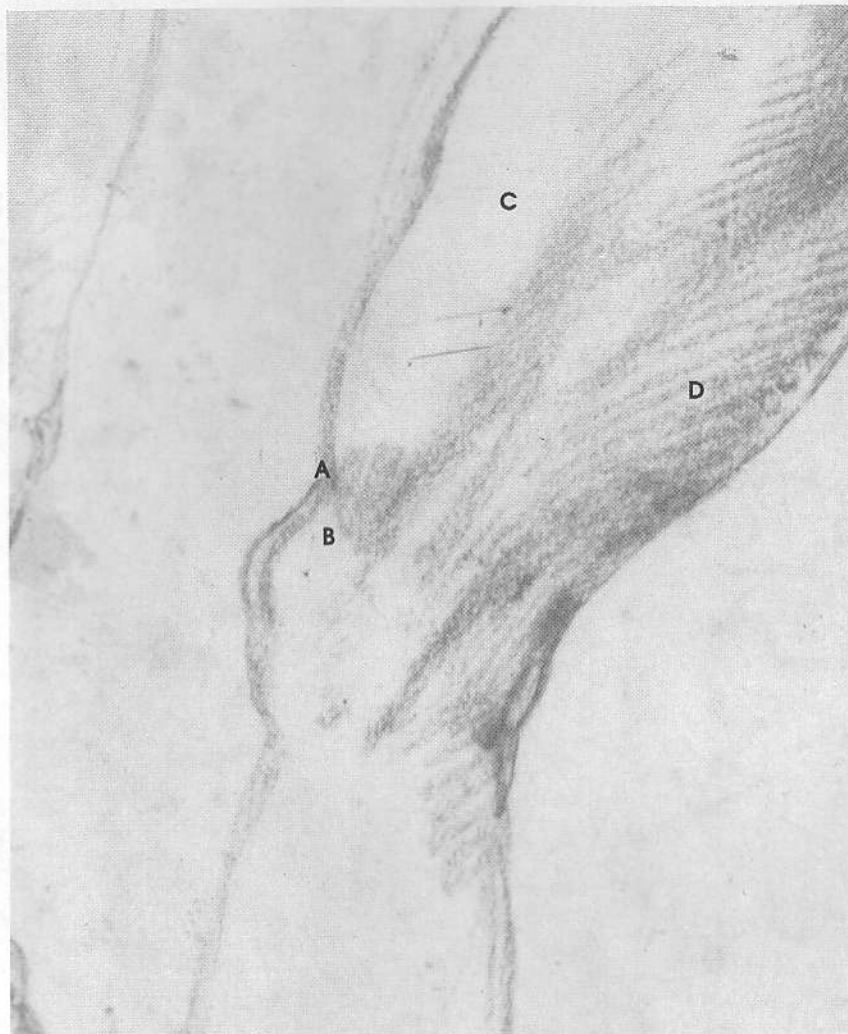
MUSCLES OF THE FOOT



STUDIES FOR THE LEGS
OF THE LORD IN CREATION
OF ADAM, HEAD OF THE NUDE
1511, red chalk over black chalk preparations
11 $\frac{1}{8}$ " x 7 $\frac{3}{4}$ " (29.53 x 29.69 cm)



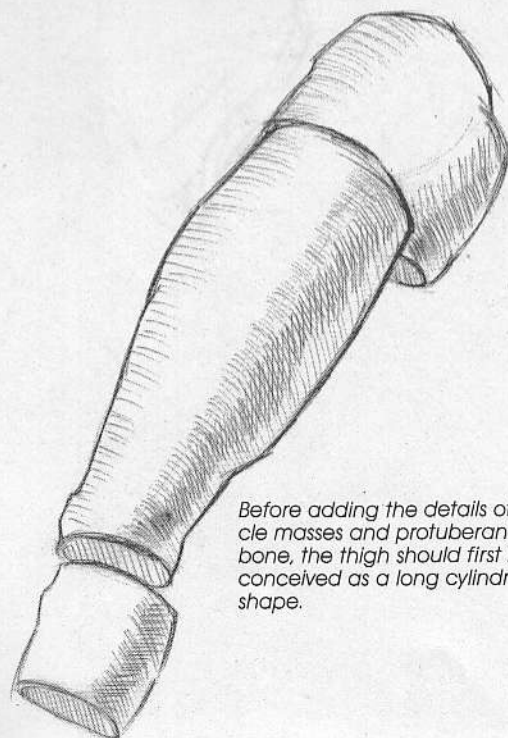
Man: The Upright Animal



Drawing the legs of the human figure is not that different from drawing the arms. The triceps mass on the front of the thigh resembles the triceps on the back of the arm. One muscle group opens the elbow and straightens the forearm to align with the upper arm; and the other group of muscles opens the knee to straighten the lower leg and align it with the thigh.

The fibers of the vastus externus muscle (A) connect to the common tendon (B). In the drawing the muscle forms a projection while the tendon is portrayed as a flat area. The triceps muscles on the front of the thigh have a common function; therefore Michelangelo's lines indicating individual muscles are subtly and lightly drawn. It is important to render the thigh as a large, cylinderlike mass and the triceps muscles as details partially embedded in and wrapping around the larger mass.

One of the great differences between man and the other animals is that man stands upright. It is evident in Michelangelo's drawings that he knew well that many of the muscles have the function of holding the body up against the force of gravity. For example, the rib cage mass is held up by rectus abdominus on the front of the torso, erector spinae from behind, and the external oblique muscles on the sides; and gluteus maximus prevents the pelvis from falling forward. And, as can be seen in the detail at left, the knee joint is supported by the triceps muscle of the thigh (C) and the hamstring mass (D).



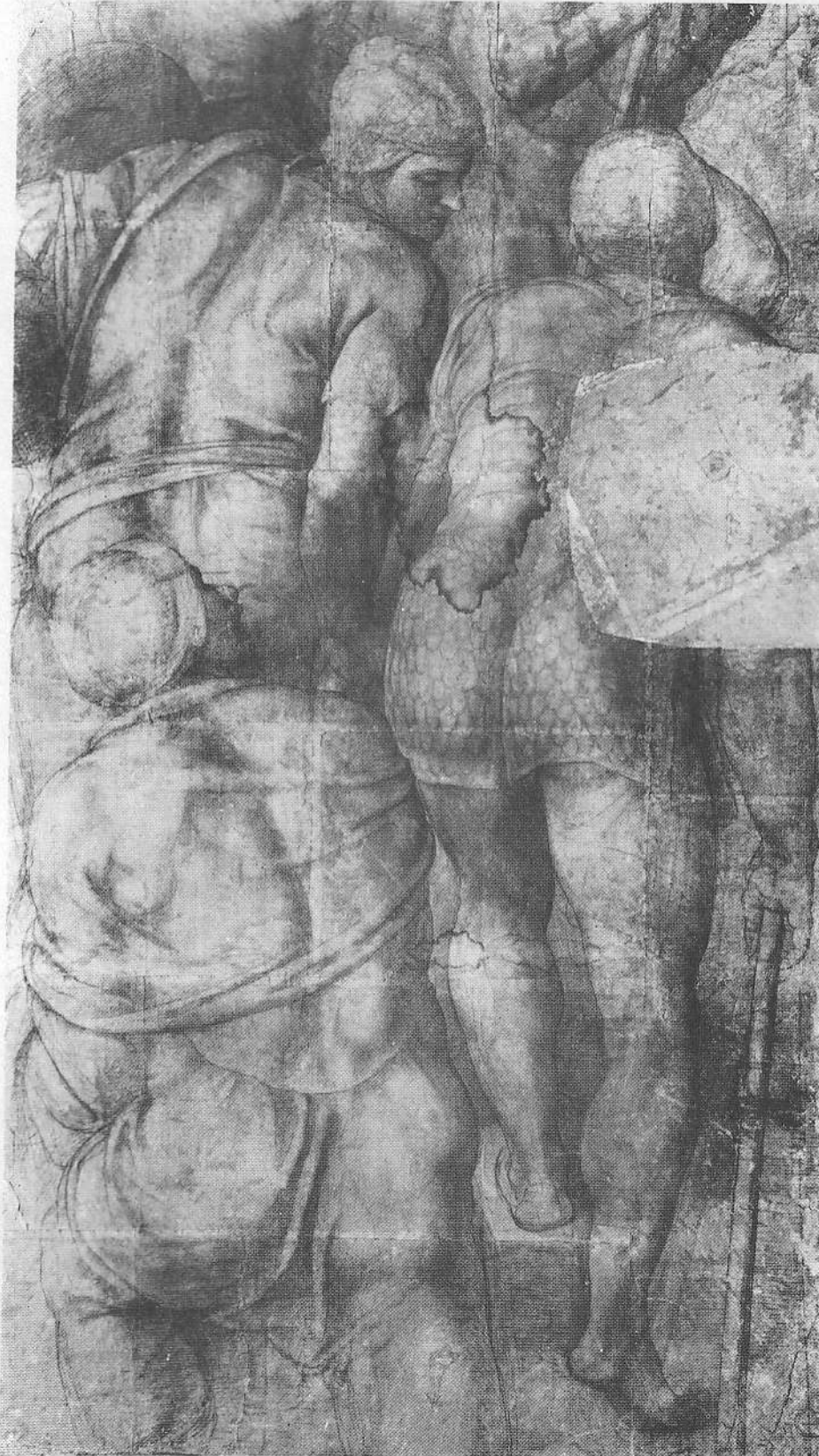
Before adding the details of muscle masses and protuberances of bone, the thigh should first be conceived as a long cylindrical shape.

FIGURE STUDY FOR
THE BATTLE OF CASCINA
1504, black chalk
15 5/8" x 10" (39.69 x 25.40 cm)



CHAPTER SEVEN

DRAPERY

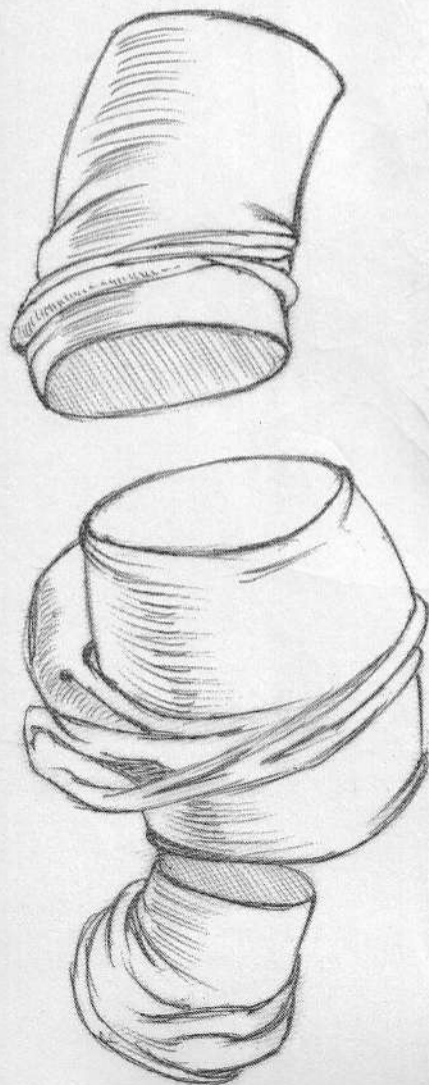


THE CRUCIFIXION OF ST. PETER
1545, black chalk
8'7½" × 5'1¾" (262.89 × 155.89 cm)

Establishing Mass

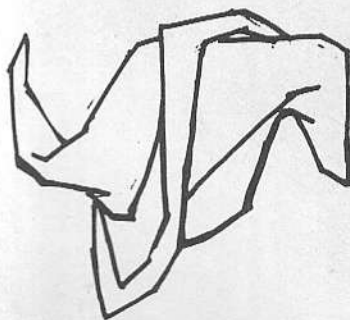
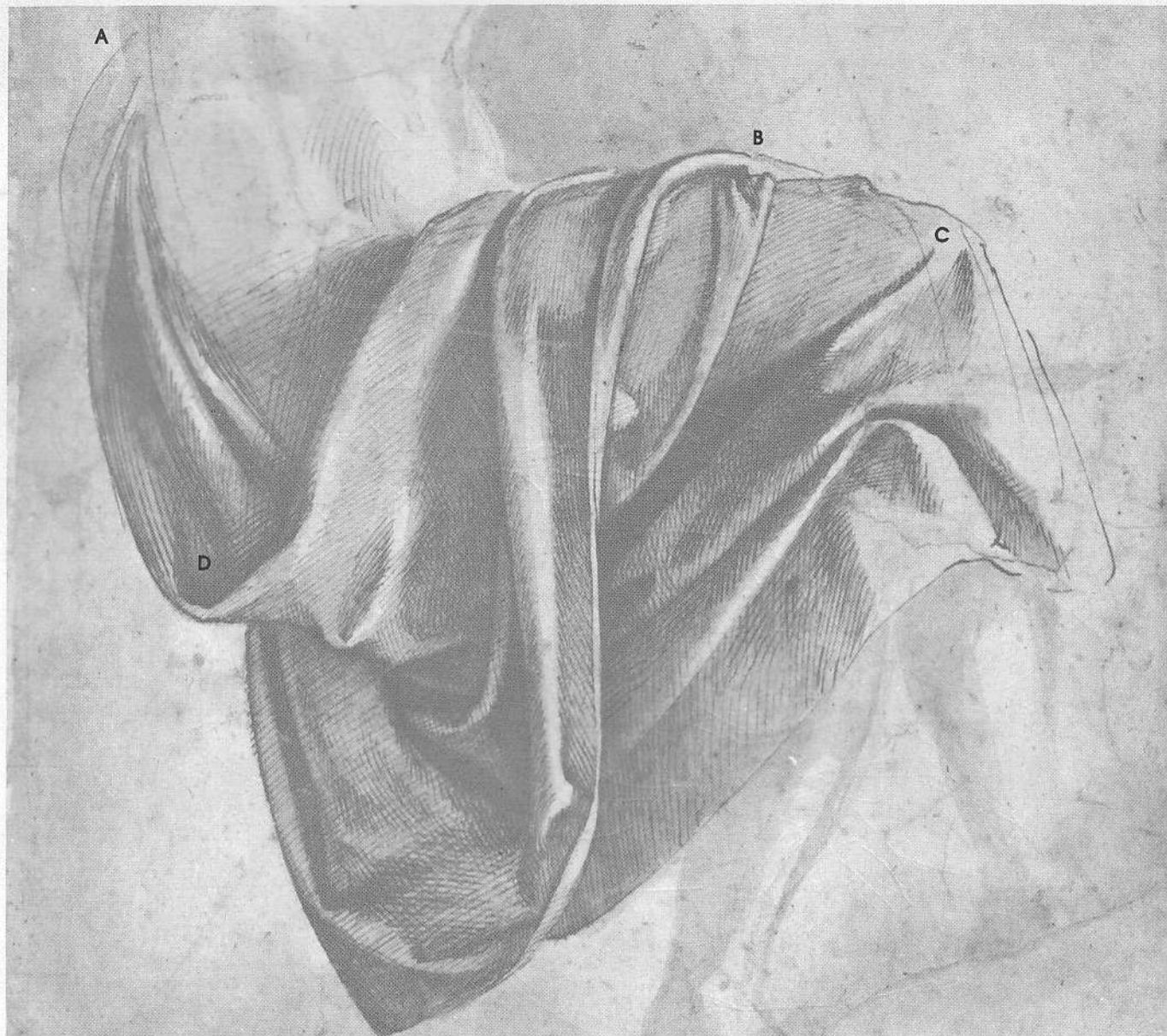
The folds of the drapery in this drawing are very much like curving cylinders or doughnuts (A) that wrap horizontally around the figures. Michelangelo uses drapery here to enhance and bring out the strong, muscular forms of the figures.

When drawing drapery, it is not necessary to slavishly copy every fold. Look beyond the details and draw the larger forms first. The same rule you observe when drawing the figure—always establish mass before worrying about detail—also applies to drapery. Drapery takes the shape of the form on which it rests. Always think of the underlying figure. Folds conform to the law of gravity; they drop from points of support. The artist first considers where these support points are. As the material falls, it may also twist, turn, or spiral, depending on the pose of the figure.



Drapery often conforms to the shape on which it rests. When drawing clothing, think of the underlying structure of the body first.

Simplifying the Folds of Drapery



Even a complex drawing of fabric by Michelangelo can be simplified into a few basic shapes.

Here is a beautiful study of drapery. Notice that the folds fall from support points behind the back (A), from the top of the thigh (B), and from the knee (C). In shape, these folds are very much like cylinders or pipes.

This study of drapery includes what is known as a half-lock fold (D), which occurs when the drapery abruptly changes direction at or near a right angle. The change in direction of fabric at the point noted here is due to the right angle formed by the torso and thigh of the seated figure.

Develop your powers of observation in

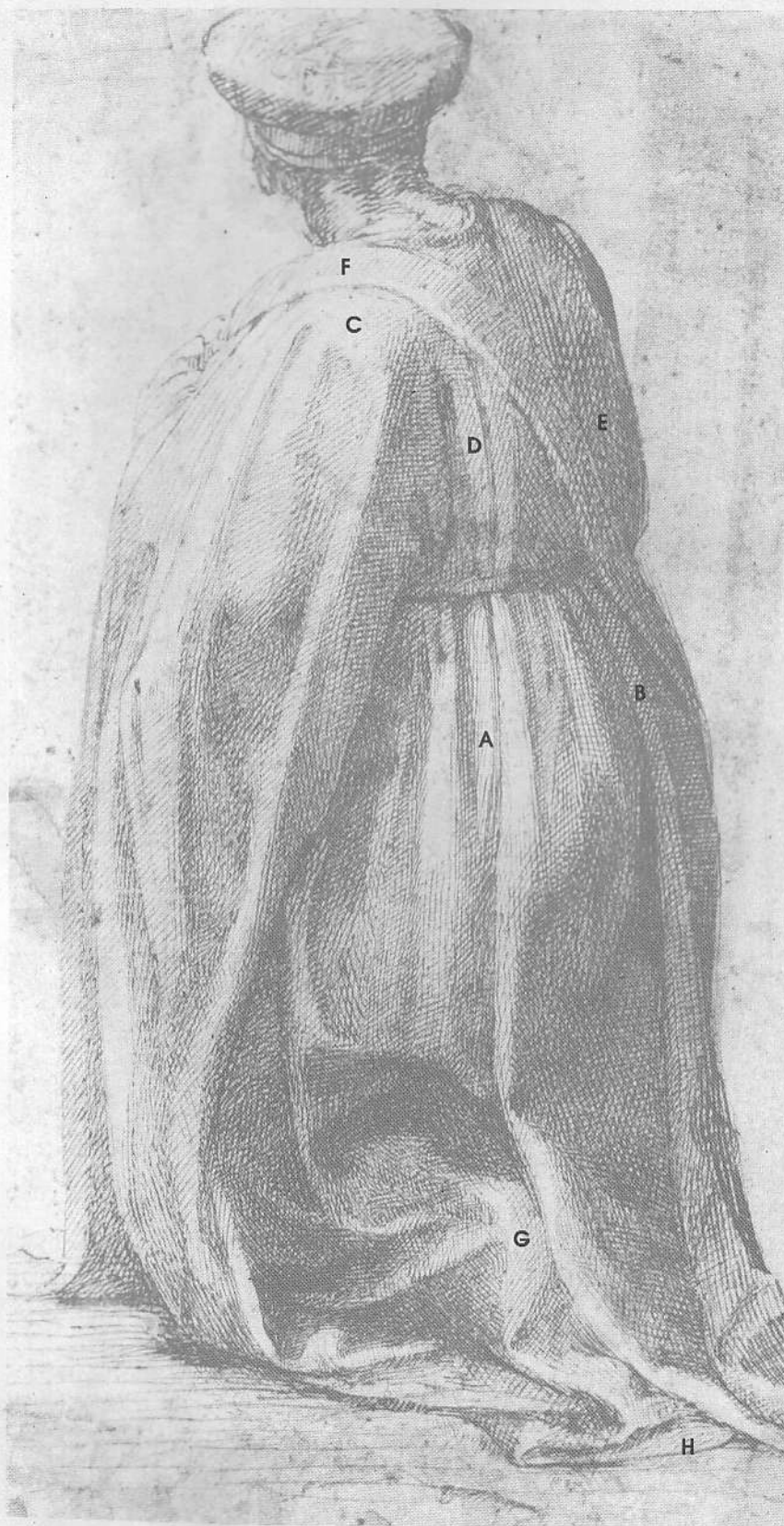
order to see beyond the more intricate folds; always sketch the larger shapes first. Each fold is different. No matter how difficult the folds may appear, they can be simplified into a few basic shapes. The art of selection, or knowing what to leave out and what to put in, requires practice, but it is a necessary element in the successful drawing of drapery.

Experiment with various arrangements of different kinds of cloth. Thick materials drape into wider masses with fewer folds than do such light materials as silk.

STUDY FOR THE DRAPERY
OF THE ERYTHRAEAN SIBYL
Black chalk and pen
15 1/4" x 10 1/4" (38.7 x 26 cm)



Massing with Light and Shade



First observe the large outside shape of the drapery on this kneeling figure. Then look at the smaller shapes within the drapery. As the material falls from points of support, it creates triangular shapes. Rarely are straight lines used for depicting drapery; instead they tend to curve. The light and shade in this drawing are stated very clearly. The light comes from above left and toward the front. Michelangelo's shaded forms never appear too spotty, or broken up, because he massed light values separately from dark values. The large mass of this figure can be likened to a rounded block with a light front plane (A) and a shaded side plane (B). The small folds are rendered in values consistent with those of the larger masses on which they rest. For instance, the folds in the highlight area on the shoulder (C) are drawn in very light values; the folds at D are drawn in middle values; and the folds in the shadow (E) are extremely dark. The movement on the shoulder strap (F) of light into dark repeats the progression of values on the drapery. The rendering of the shoulder strap reinforces the cylindrical shape of the shoulder beneath.

The folds extending down from the shoulder and from the waist are characteristic drop, or pipe, folds. The arrangement of the drapery at G is an example of a zigzag fold. When drapery has no point of support but simply rests on the floor, the possible patterns of folds are virtually limitless; such folds are termed inert (H).

STUDIES FOR KNEELING DRAPED FIGURE
1501-03, pen 11 $\frac{1}{2}$ " \times 8" (29.53 \times 20.32 cm)



The Gesture or Rhythm of Fabric



Since drapery rests on a figure that has a gesture, or action, the fabric too must have a rhythm, or gesture. The lines of the folds at A spiral down the inside of the thigh much like the sartorius muscle underneath.

In a study of the work of Michelangelo, it is not always clear which drawings were actually made by him and which drawings have been inaccurately attributed to him. Michelangelo scholars often disagree. I myself think that this is not one of Michelangelo's drawings despite its attribution to him. The lines do not have the sureness and spontaneity of his other works. Nor do they define the underlying anatomy in the unhesitating way that I have come to expect in his sketches. Also the hands, heads, and feet are rather weakly portrayed.

THREE MEN IN CONVERSATION
1526, pen and ink
14⁷/₈" × 10" (37.8 × 25 cm)



IN CONCLUSION



COMBAT OF HORSEMEN AND FOOT SOLDIERS
1504, pen 7" x 9 1/8" (17.78 x 25.08 cm)
Damaged
Ashmolean Museum, Oxford.

The Elements of a Master Drawing

Here is an extraordinary sketch of men and a horse that I will enjoy looking at for the rest of my life. It is the culmination of Michelangelo's complete understanding and execution of the basic elements of drawing. "No one thinks how much blood it costs," Michelangelo said of drawing. Drawing was the foundation of all art in the Renaissance. The basic elements of line, mass, anatomy, light and shade, planes, and perspective were the vocabulary with which this pictorial poem was created.

The swiftly executed lines at A indicate how the drawing was conceived and begun. Over a delicate sketch, the lines suggesting shading of the forms (B) are fiercely hatched in. The torsos of the men are slowly refined, while the

more mobile limbs of the men and the horse (C) are roughed in with fleeting contour lines. During the evolution of a drawing, a figure may have two heads, four arms or legs, and so on because the contour lines are constantly changing in the process of positioning the lines. After many years of careful study of the figure, the artist's understanding of the elements of drawing is instinctive; it is then possible to draw complicated subjects from the imagination. The daring positions of the figures and horse as shown here could not possibly have been posed. In this drawing you see the working mind of a master; you see not only a representation of the subject of battle but also the battle involved in creating a great drawing.



GLOSSARY

The following is a list of terms frequently encountered in the study of anatomy.

abductor a muscle that pulls away from the midline of the body

adductor a muscle that pulls toward the midline of the body

condyle a large bump on a bone

crest a ridge on a bone

extensor a muscle that causes some part of the body to straighten out

flexor a muscle that causes some part of the body to bend

insertion the end point of muscle attachment

origin the fixed point of muscle attachment

pronator a muscle that turns the palm of the hand downward

protuberance or tuberosity a small bump on a bone

spine a sharp ridge of bone

supinator a muscle that turns the palm of the hand upward

tensor a muscle that performs a tightening function

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Uffizi, Florence: pp. 104–105.

INDEX

- Abdominal muscles, 62
- Abductors,
 - fingers, 104
 - foot, 126
- Acetabulum of hip joint, 67
- Achilles tendon, 122
- Acromian process, 17, 18, 75, 77
- Adam's apple, 44
- Adductor mass of thigh, 108–109
- Adductors, 94, 99
 - gracilis, 110–111
 - thigh, 108–109
 - thumb, 99
- Ala, 41
- Anatomical drawing, 16, 71, 100
- Anatomical saltbox, 46
- Anatomical snuffbox, 102
- Ankle, 17, 21, 124–125
- Anterior superior iliac spine, 19, 66
- Antihelix, 34
- Antitragus, 34
- Arch, 124–125
- Armpit, 62, 95
- Aristotle, 84
- Arm-bone, see Humerus
- Arms, 88–105
 - bones of, 17, 89, 96–97
 - extension and flexion, 96
 - extensors, 97–99
 - flexors, 97–99
 - forearm, 89, 96–97, 100–101, 104
 - latissimus dorsi and, 78
 - length of, 96
 - movement of, 74, 78, 96, 99
 - muscles, 89–97
 - raised, 94
 - scapula and, 92–93
 - tendons, 98, 100
 - triceps, 90–91
 - upper, 89
- Axilla, 62, 95
- Back, 70, 72–79, 80–81
 - forms of, 70
 - modeling, 80–81
 - muscles of, 72–79
- Backbone, 50
- Balance, 82–83
- Biceps, 89, 90, 94–95
 - origin and insertion, 89
 - short head, 95
- Bicipital groove, 58, 75, 78
- Bicipital tuberosity, 96
- Brachialis, 97
- Breastbone, see Sternum
- Breasts, 68
 - placement male/female, 68
- Buttocks, 84–85
- Calcaneus, 18, 19, 122–125
- Calf muscles, 122–123
- Caninus, 41
- Capitulum, 96
- Caracoid process, 89
- Carpus, 17, 96
 - see also, Wrist
- Cast shadows, 36
- Cheekbone, 17, 41
- Chest, 58–59
- Chin strap, 32
- Clavicle, 12, 17, 18, 21, 46, 52, 56, 58
- Coccyx, 18, 19, 82, 84
- Collarbone, see Clavicle
- Common tendon, 21, 92–93, 115
- Composition, 24
- Concha, 34
- Condyle of humerus, 92–93, 98–99
- Condyles of femur, 122
- Contour drawing, 11
- Coracobrachialis, 94–95
- Coracoid process of scapula, 17
- Coronoid process, 42–43
- Corrugator supercilli, 41
- Costal cartilage, 50
- Cranium, 19, 29, 40
 - relationship to face, 29
- Cricoid cartilage, 44
- Darwin, Charles, 84
- Deltoid muscles, 58, 62, 68, 89, 92–93, 94–95
 - action of, 89
 - on female, 68
 - origin and insertion, 89
 - raised arm, 94–95
- Depressor anguli oris, 41
- Depressor labii inferioris, 41
- Digitations, 60, 62, 64
- Dorsal spines of thoracic vertebrae, 78
- Dorsum, 122, 124, 126
- Drapery, 130–137
 - gesture of, 136
 - simplifying, 132
 - support points, 131, 132, 134
- Drawing, 12, 110, 128, 139
 - drapery, 130–137
 - with line, 12
- Ear, 34
- Earlobe, 34
- Egyptian proportions, 21
- El Greco, 23
- Elbow, 17, 89, 96, 100
 - movement of, 96
 - point of, 96
- Erector spinae, 72
- Extension, 96, 123, 124
- Extensor digitorum longus, 118–119, 126
- Extensor of the great toe, 126–127
- Extensors, 96–97, 98–99
 - arm, 96–97, 104
 - finger, 104
 - foot, 118–119, 122, 124, 126
 - legs, 107, 118–119, 126
 - thumb, 99
- External malleolus, 19, 118
- External oblique muscle, 64, 66, 68
- Eyes, 30, 32, 40–41
- Facial features;
 - eyes, 30, 32, 40–41
 - light and shade on, 34, 36
 - mouth, 38
 - muscles of, 40–41
 - nose, 38
 - placement of, 32, 38
 - proportional system, 32
- Fascia, 84
- Female/Male variations, 68, 82
 - pelvis, 82
 - sacrum, 82
 - torso, 68
- Femur, 17, 18, 19
- Fibula, 17, 18, 19, 118–119, 120–121
 - head of, 19
 - muscles of, 120–121
- Fingers, 17, 96, 100, 104–105
- Flexion, 96, 123, 124
- Flexor muscles, 98–99, 110–111
 - back of leg, 110–111
 - forearm, 98–99
 - lower leg, 118–119
- Fold of the groin, 66–67
- Foot, 120, 124–127
 - bony arch, 124–125
 - leg relationship, 120
 - muscles of, 126–127
- Foreshortening, 52, 56–57, 89, 102
- Form, 10–27, 38
 - arm to scapula, 92–93
 - back, 70
 - designing, 24–25
 - forearm, 100
 - knee, 116
 - line and, 12–13
 - male/female variations, 68
 - overlapping, 60, 89
 - planes and, 54
 - shapes and, 14–15
 - simplifying, 26–30, 52, 131
 - skeletal structure and, 16–19
 - under drapery, 131
 - underlying structure, 10, 16–27, 131
- Frontal bone, 17
- Gastrocnemius, 122–123
- Geometric forms, 52, 60
- Gesture, 11, 16, 24, 136
- Glabella, 38
- Gladiolus, 58

- Glenoid cavity, 18, 89
- Gluteus maximus, 84–85
- Gluteus medius, 68, 86
- Goose foot, 110–111
- Gracilis, 110–111
- Gravity, 128, 131
- Greater trochanter, 18, 19, 84
- Greater tuberosity, 90
- Greek proportions, 21
- Groin, fold of, 66–67, 68
 - on female, 68
- Hamstring mass, 84, 110–111, 116
 - action of, 110
 - muscles of, 84, 110–111, 116
- Hand, 96, 102–105
 - bones of, 96
 - length, 96
 - muscles of, 102, 104
 - simplifying, 104–105
 - tendons, 102, 104
- Head, 29–42
 - bones of, 17
 - facial features, 32, 34, 38
 - massing, 29, 32
 - neck and, 76
 - position in space, 30
 - relationship to face, 29
 - rotation of, 46
 - tilt of, 30, 34, 46, 76, 83
- Hearing canal, 34
- Heel bone, see Calcaneus
- Helix, 34
- Highlights, 36
- Hinge joint, 17, 96
 - elbow, 96
 - foot, 124
- Humerus, 17, 19, 21, 58, 75, 96–97
 - condyle of, 92–93
- Hyoid bone, 44
- Hypothenar mass, 102
- Iliac crest, 17, 64, 78, 84
- Iliac spine, 17, 18, 19
 - anterior superior, 19
 - posterior, 18
- Iliotibial band, 108–109, 116
- Illum, 67, 72
- Infraspinatus, 74–75, 80–81, 92–93
- Instep, see Metatarsals
- Internal malleolus, 19, 118
- Jaw, 17, 40, 41, 42–43
- Knee, 21, 114–115, 116–117
 - bones of, 114–115
 - forms of, 116–117
 - proportions of, 21
- Kneecap, see Patella
- Kneeling point, 19, 21
- Landmarks, 23, 82, 84, 89, 92, 114, 126
- Latissimus dorsi, 60, 62, 78, 80–81,
 - 94–95
 - action of, 78
 - origin and insertion, 78
 - raised arm, 94–95
- Larynx, 44
- Legs,
 - calf muscles, 122–123
 - foot and, 120, 122–127
 - hamstrings, 110–111
 - lower, 118
 - thigh, 106–109
- Levator angulioris, 41
- Levator labii superioris, 41
- Levator labii superioris alaeque nasi, 41
- Light source, 21, 26, 36, 38, 74, 78, 118,
 - 134
- Line, 11, 52, 66, 139
 - contour, 14, 102, 139
 - curved, 34
 - form and, 12–13, 34, 52, 78, 139
 - overlapping, 89, 102
 - planes and, 66
 - value and, 36
- Linea alba, 62
- Light and shade, 11, 14, 21, 36, 74, 78,
 - 100
 - drapery, 134–135
 - facial features, 34, 36
 - Michelangelo's, 118
 - modeling the back, 80–81
 - planes and, 54, 100
 - value and, 34, 36
- Long extensor of the toes, 118–119
- Long supinator, see Supinator
- Lumbar aponeurosis, 78
- Lumbar vertebrae, 19
- Malar, 17
- Male/Female variations, see
 - Female/Male Variations
- Malleolus, 19
- Mandible, 17, 41
- Manubrium, 58
- Mass, 12, 14, 21, 26, 49, 68
- Massing,
 - back, 80–81
 - forearm, 100–101
 - head, 29, 32, 36, 41
 - modeling and, 80–81
 - on female, 68
 - pelvis, 23, 68
 - placement and, 49
 - rib cage, 50
 - under drapery, 131–132
 - with light and shade, 134
- Masseter muscle, 41–43
- Mastoid process, 18, 46
- Maxilla, 17, 41
- Metacarpals, 17, 96
- Metatarsals, 17, 118–119, 124
- Modeling the back, 80–81
- Mouth, 30, 32, 38, 41
 - muscles of, 41
 - placement of, 32
- Muscles,
 - contraction of, 64, 74, 84, 90
 - female/male variations, 68
 - movement of, 64, 72, 78
 - of expression, 40–41
 - see also Extension and Flexion
- Muscles of expression, 40–41
- Nasal bones, 17
- Neck, 36, 44
 - forms of, 44
 - muscles of, 44, 46, 76
 - vertebrae of, 19
- Nipples,
 - placement, male/female, 68
- Nose, 30, 32, 38, 41
 - muscles of, 41
 - placement of, 32
- Obliquus externus abdominus, 64
- Occipital bone, 18
- Occipito-frontalis, 40, 41
- Olecranon, 18, 89, 96
- Orbicularis oculi, 40
- Orbicularis oris, 41
- Orbit, 17
- Overlapping forms, 60, 89
- Overlapping lines, 89, 102
- Parietal bones, 18
- Patella, 17, 19, 114–116
 - ligament of, 115–116
- Pectoralis major, 58, 60, 62, 89, 94
- Pectoralis minor, 94
- Pelvic crest, 19
- Pelvic point, 19, 66
- Pelvis, 16, 17
 - balance and, 82–83
 - male/female variations, 82–83
 - mass of, 23
- Pentimenti, 11
- Peroneal muscles, 120–121
- Phalanges, 17
 - fingers, 17, 96–97, 104
 - toes, 17, 119, 124–125
- Philtrum, 32
- Planes, 54, 66
- Pose, 11, 16, 82–83, 100
 - balance of, 82–83
 - pelvis and, 82–83
 - upright, 128
- Positioning,
 - demipronation of arm, 96–97
 - head in space, 30

- mass of body, 49
- profile of torso, 86
- pronation of hand, 99
- rib cage in space, 52
- Posterior femoris, see Hamstring mass
- Posterior iliac spine, 18
- Poupart's ligament, 66–67
- Preliminary sketches, 12, 23
- Proportions, 11
 - arm to hand, 96
 - facial features, 32
 - knee to body, 21
 - of figure, 20–23
 - Renaissance, 22–23
 - systems of, 20–23, 32
- Pubic bones, 62
- Pyramidalis, 62
- Pyramidalis nasi, 41
- Quadriceps, 21, 84, 107–108
 - action of, 107–108
 - common tendon, 107
 - origin and insertion, 107–108
- Radius, 17, 18, 19, 89, 96–97
 - movement of, 96–97
- Rectus abdominus, 62
- Rectus femoris, 107, 115–116
- Renaissance proportions, 22–23
- Rhomboideus, 74–75, 80–81
- Rhythm, 24–25
- Rib cage, 21
 - massing of, 50, 52
 - positioning in space, 52, 56–57
 - tipped, 64
- Ribs, 18, 19, 50, 58, 60, 62
 - cartilage of, 50, 58, 62
 - vertebrae of, 19
- Rim of ear, see Helix
- Sacrum, 18, 19, 72, 82–84
 - male/female variations, 82–83
 - origin of erector spinae, 72
 - origin of gluteus maximus, 84
 - origin of latissimus dorsi, 78
- Sartorius, 108–109, 110–111
 - action of, 108
 - origin and insertion, 108–109
- Scalene muscles, 44
- Scapula, 17, 18, 21, 56
 - muscles of, 60, 74–75, 78
 - placement of, 74–75
 - relationship to arms, 92–93
 - spine of, 18
- Serratus anterior, 95
- Serratus magnus, 60, 64
- Shadows, 36
- Shape,
 - of drapery, 131, 132
 - of forms, 14–15
 - outside, 14, 134
 - simplifying, 132
- Shinbone, see Tibia
- Short extensor of the toes, 126–127
- Shoulder blades, see Scapula
- Shoulder girdle, 46, 56–57
- Shoulder joint, 17
- Shoulder muscle, 58
- Shoulders, 82–83
- Skeletal framework, 16–19
- Skull, 40
- Soleus, 122–123
 - Space, forms in, 30, 52, 56–57, 60
- Spine of the scapula, 18, 75
- Standing, 128–129
- Sternocleidomastoid, 46
- Sternomastoid, 34
- Sternum, 17, 21, 46, 50, 58
 - parts of, 58
- Supinator, 97–99
- Supraspinatus, 74–75
- Symphysis pubis, 19, 66–67
- Tarsal bones, 124–125
- Tarsus, 17, 21
- Temporalis fossa, 42
- Temporalis, 41–43
- Tendon sheets, 76, 78
- Tensor fasciae latae, 108–109
- Teres major, 62, 74–75, 80–81, 92–93, 94–95
 - insertion, 75
- Teres minor, 74–75, 80–81, 92–95
- Thenar mass, 102
- Thigh, 107–113
 - front of, 107
 - hamstrings and, 110–111
 - movement of, 108–109
 - relationship to pelvis, 112–113
- Thighbone, see Femur
- Throat, 46, 56, 58
- Thoracic arch, 62
- Thumb, 99, 104–105
 - muscles of, 99, 104
 - relationship to fingers, 104–105
- Thyroid cartilage, 44
- Tibia, 17, 18, 19, 21, 118–119
 - tubercle of, 19, 21
- Tibialis anterior, 118–119, 126
- Tilt,
 - of head, 30, 34, 46, 76, 83
 - of pelvis for balance, 82–83
- Torso, 48–86
 - anterior of, 48–69
 - bones of, 17, 58
 - forms of chest, 58–59
 - muscles of, 60
 - overlapping forms of, 61
 - planes of, 54
 - posterior of, 70–87
 - profile of, 86
 - rib cage, 50–52
 - shoulder girdle, 56–57
- Trachea, 44
- Tragus, 34
- Trapezius, 46, 56, 76–77, 80–81, 89
 - origin and insertion, 76–77
- Traverse tendons, 62
- Triceps, 89, 90, 92–95
 - action of, 90
 - external head of, 92–93
 - internal head of, 92–93, 94
 - long head of, 92–93
 - origin and insertion, 90
- Triceps femoralis, see Quadriceps
- Tubercle of the tibia, 19, 21
- Ulna, 17, 18, 19, 89, 96–97, 100–101
 - massing, 100–101
 - movement of, 96–97
- Upright pose, 128
- Value, 34, 36, 38, 80–81, 134
 - modeling the back, 80–81
- Vastus externus, 107–108, 115, 116
 - origin and insertion, 107–108
- Vastus intermedius, 107
- Vastus internus, 107, 115, 116
- Vertebrae, 18, 19
 - cervical, 19, 74–75, 76
 - erector spinae muscles and, 72
 - latissimus dorsi and, 78
 - lumbar, 19, 72, 78
 - scalene muscles and, 44
 - scapulae and, 74–75
 - trapezius and, 76
 - thoracic, 19, 50, 74–75, 78
- Weight, 68, 84, 86, 120, 122
 - on legs, 84, 86, 120
 - on toes, 122
 - placement of, 68
- White line, 62
- Wrist, 17, 96, 100–101
 - bones of, 96
- Wrist bracelets, 102
- Xiphoid process, 17, 21, 58, 62
- Zygomatic arch, 40–43
- Zygomaticus major, 41
- Zygomaticus minor, 41

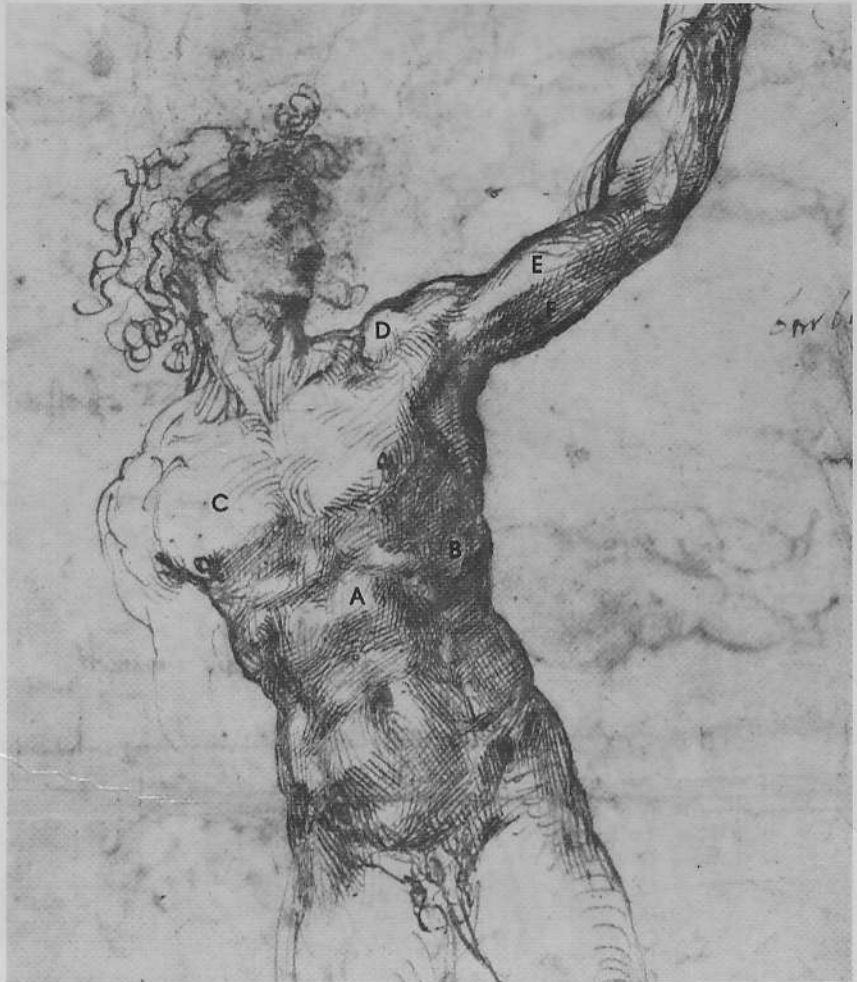
THE UNDERLYING STRUCTURE OF FORM/THE HEAD AND NECK THE TORSO: ANTERIOR AND POSTERIOR REGIONS THE UPPER LIMB/THE LOWER LIMB/DRAPERY

Consider what portions of the various parts of the figure you are looking at in this drawing. Do you see the top, front, side, or all of these? These are the planes of a form.

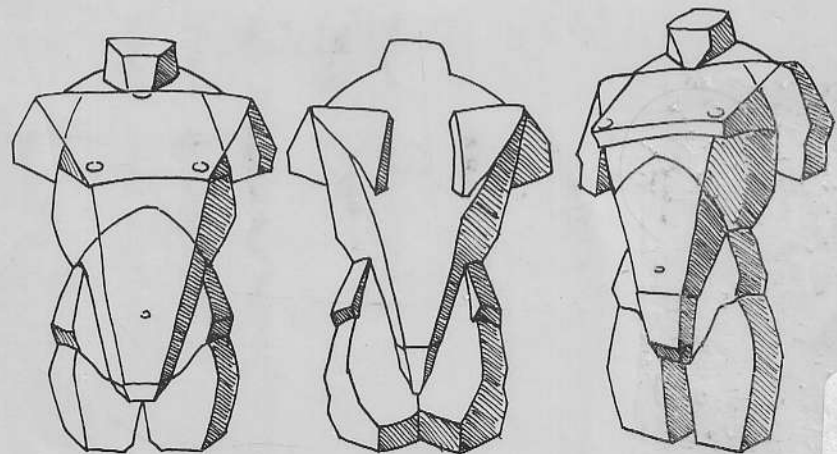
Disregarding details for a moment, think of the torso as a large block created by the front plane (A) and the side plane (B). The side planes of the torso are at a slight obtuse angle to the front plane, making the back wider than the front of the torso.

Imagine a series of lines running from the top of the shoulders to the nipples, from shoulder to shoulder, and from nipple to nipple. These lines would define the big top plane of the chest (C), which is wider at the shoulder than at the nipples; this plane includes the front plane of the deltoid muscle (D).

You may notice that the accurate definition of planes is directly related to the successful handling of light and shade. For instance, the arm on the right is drawn as a rounded block; the light top plane (E) is clearly separated from the plane in shadow (F).



NUDE MALE FIGURE RUNNING
1496-1500, pen, brown, ink, and black chalk
14 3/4" x 9 1/8" (37.47 x 23.18 cm)



These simple drawings were done as preliminary sketches to determine the large planes of the torso from the front, back and three-quarter views.

CNTRL