

Rubens



Study of Arms

2006, red chalk, 26 x 19. All artwork this article collection the artist unless otherwise indicated.

This study shows the major masses of the arm in different positions and from different angles. Remember that your knowledge of the structure of the arm is always tempered by the idiosyncrasies of foreshortening and lighting.

UNDERSTANDING ANATOMY:

Drawing the Arm

by Ephraim Rubenstein

Some of the most poignant moments in the visual arts involve arms. I think immediately of Yahweh's extended arm from Michelangelo's Sistine Chapel ceiling, about to transfer the spark of life to Adam's exanimate one; or of Daphne's arms morphing into tree branches as she flees Apollo in terror in Bernini's astounding statue. Our arms are how we engage physically with the world, either to enact our will upon it or to protect ourselves from it. To use arms expressively in our work, we have to be able to draw them in a multitude of positions and from every possible angle. In order to do this, we must first understand the structure of the arm, both inside and out.

Form and Function

The body is a complex machine, and the arm, in particular, has proved capable of executing a huge number of tasks, from gathering food to assisting the hand in performing heart surgery. Perhaps the major functional principle to remember in drawing the arm is that the movement of any part—the shoulder, upper arm, forearm, wrist, or hand—is controlled by the part preceding it anatomically. Therefore, the muscles of the shoulder and back control the upper arm, the muscles of the upper arm move the forearm, and the muscles of the forearm control the wrist and hand.

Bones and Joints

The upper arm has only one bone, the *humerus*, while the forearm has two, the *radius* and the *ulna*. These three long, thin bones allow us to extend our reach outward into space and act as levers to help us lift, push, pull, and hold on to objects.

The upper arm is longer than the forearm. The radius and ulna are approximately five sixths the length of the humerus, which means that the distance from the shoulder to the elbow is greater than from the elbow to the wrist.

The arm has three major joints—the shoulder, elbow, and wrist—all of which offer varying degrees of movement. The shoulder is a true ball-and-socket joint, affording extensive movement in all directions.

The elbow is a hinge joint that, because of its more limited action, acts as a stabilizing brace for the arm as a whole. The articulation between the humerus and the ulna allows only for bending and straightening the forearm, or *flexion* and *extension*. To make up for this limitation, the second bone of the forearm, the radius, has a shallow ball-and-socket joint that allows it to rotate around the ulna. This is called *pronation* and *supination*. Supination is when your arms are at your sides and your palms are facing forward; pronation is when your palms are directed backward. In supination, the radius and ulna run parallel to each other; in pronation, the radius crosses over the ulna.

BELOW

Study of the Skeleton of the Arm

1981, graphite, 8 1/2 x 22 1/4.

The bones constitute the basic armature upon which we are built. Your ability to draw the arm meaningfully is dependent upon your understanding of the bone structure and your ability to locate the subcutaneous, bony landmarks.

BOTTOM

Dissection Drawing of the Forearm

1982, graphite, 14 x 10 1/2.

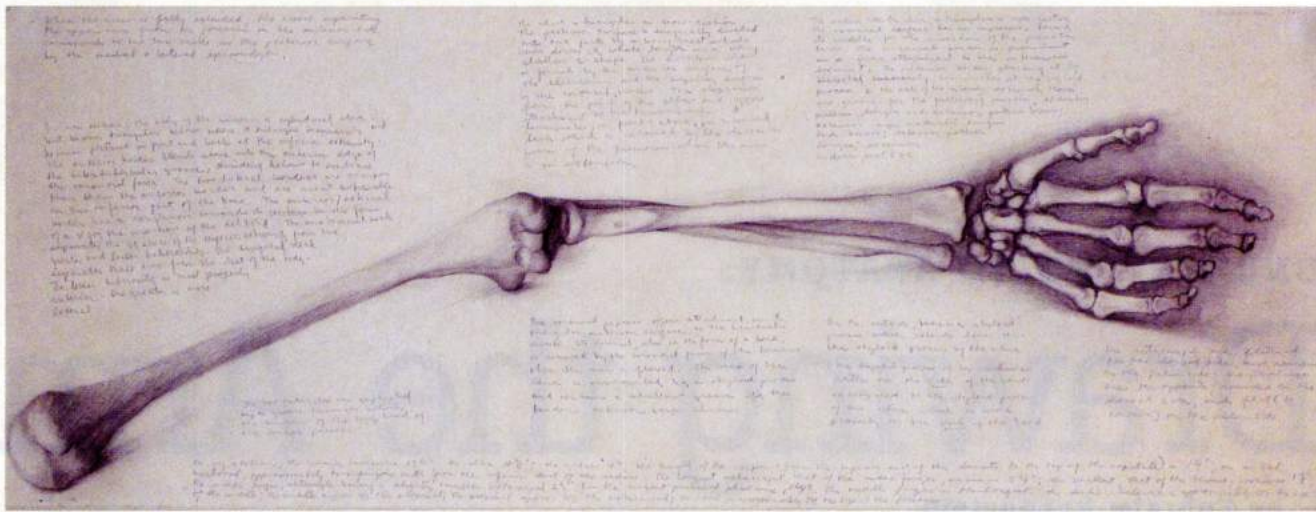
In this dissection, we were so intent on separating and defining the muscles of the forearm that we never flayed the hand. The arm itself was held up by a thick string that allowed us to approach it from all sides.

OPPOSITE PAGE

Dissection Study of the Forearm

1982, graphite, 14 x 10 1/2.

My dissection work with Professor Salvatore Montano over a four-year period was an experience that changed my life. "The body as machine"—as an elaborate system of levers and pulleys—is apparent when examining a cadaver. The extensor group of the forearm is particularly complicated, and this dissection required the greatest delicacy.

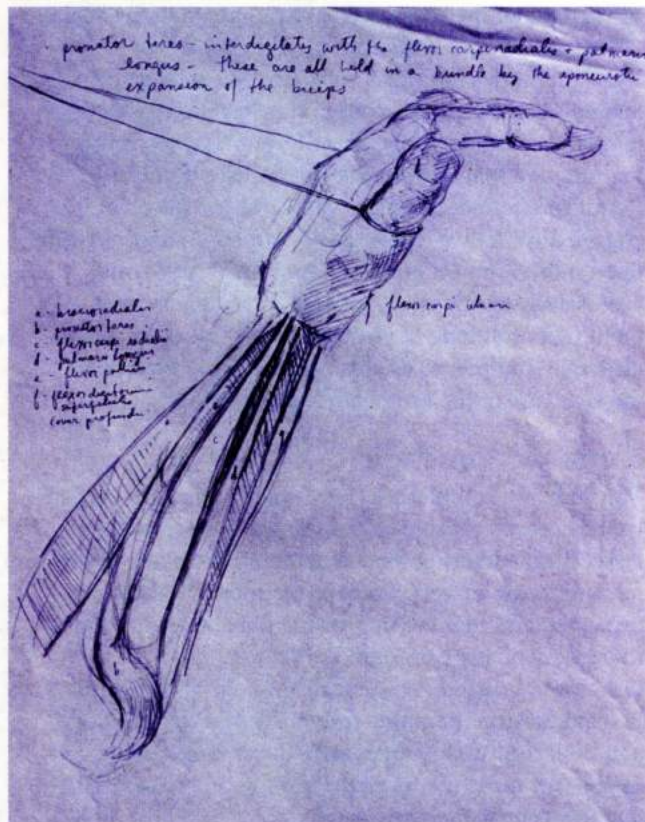


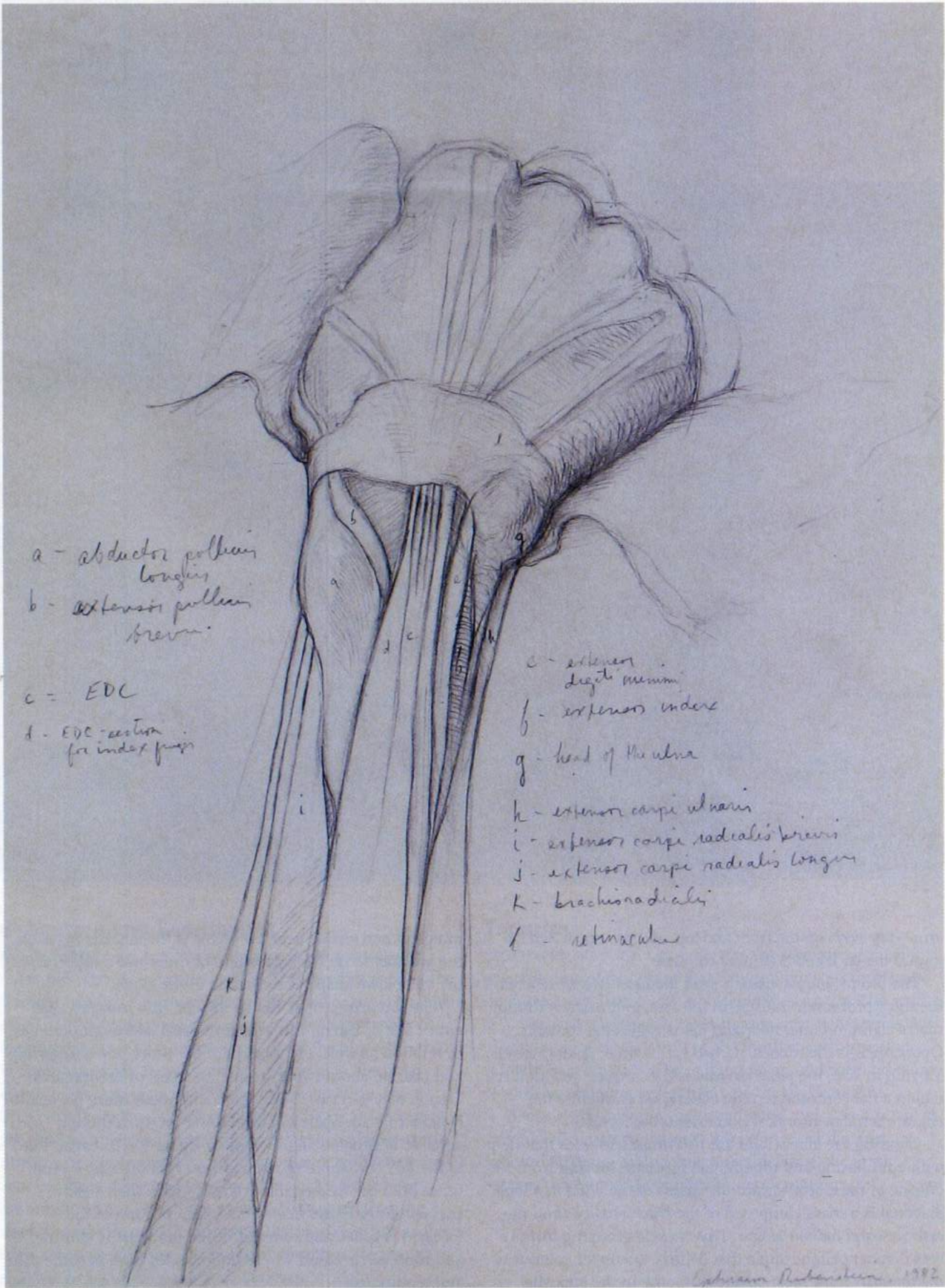
Finally, the wrist is made up of eight small bones bound together in a shallow arch, and their relatively loose articulation with the radius and ulna allows for a good deal of flexion, extension, rotation, and lateral movement.

Major Masses

There are close to two dozen different muscles in the arm proper. Some of them are so deep that we do not really see them, except to the extent that they enlarge the muscles that lie above them. But there are several significant muscle groupings that make up the surface anatomy of the arm that are of particular importance to us in drawing.

Joining the arm to the shoulder is the mass of the *deltoid*, named after the Greek letter *delta* for its flat, triangular shape. The deltoid completely covers the shoulder joint and has three distinct segments—front, side, and back—that all join together in the triangle's point of insertion into the middle of the upper arm. The middle section has secondary fibers that run obliquely to the mass of the muscle and can often be seen on well-developed models. The deltoid raises or *abducts* the arm, as well as moves it forward and backward. The three distinct segments can contract to greater or lesser degrees depending on which direction the arm is to be moved. It's valuable to locate the bottom point of the triangle because it serves as a landmark that separates the other two significant muscle masses of the upper

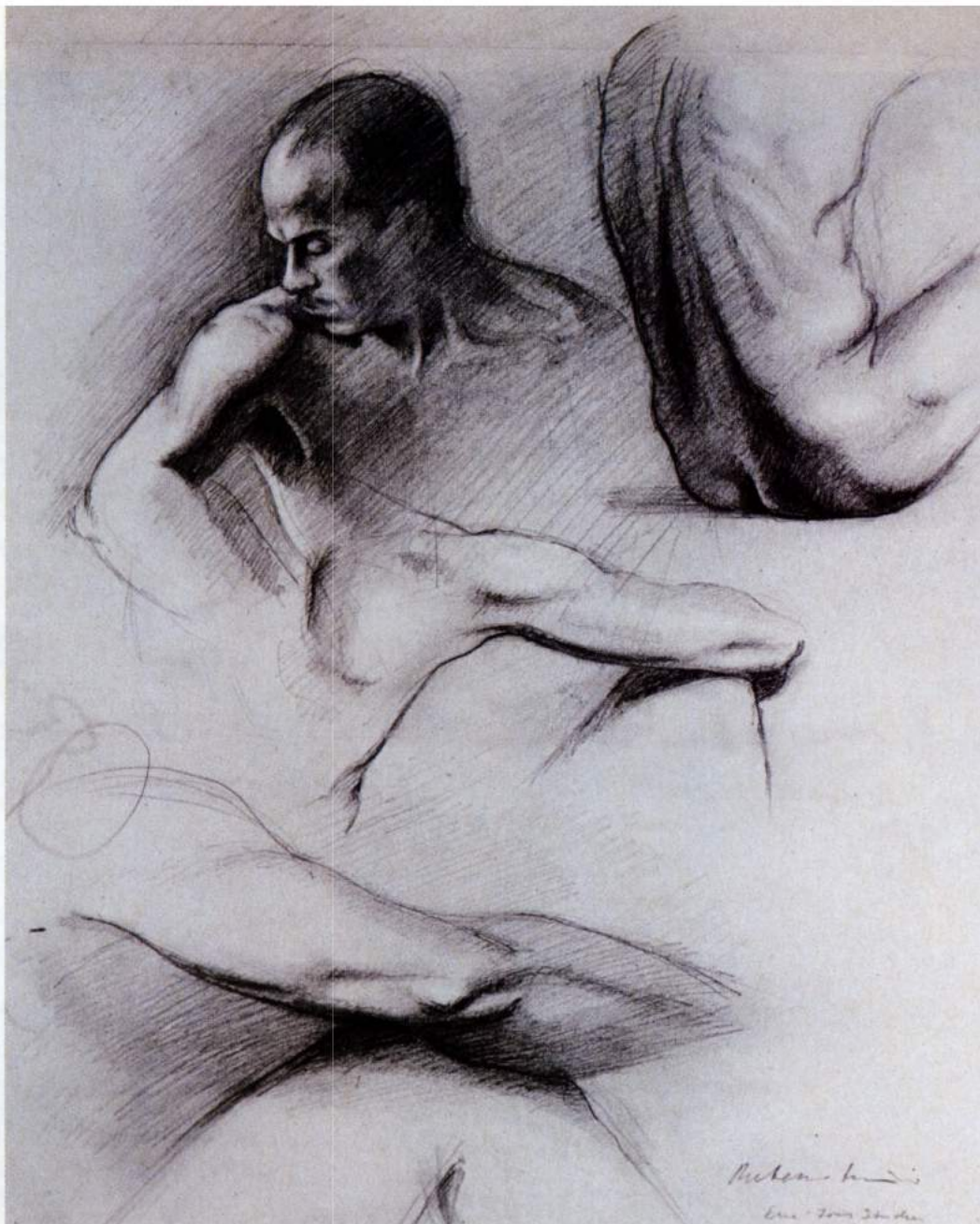




Sketchbook Page

2003, graphite on grayish paper, 15¼ x 12.

This model had particularly beautiful shoulders and arms, which I drew from various angles so I could learn their form. I always keep a sketchbook with me so I never miss an opportunity to reinforce my understanding of the body.



arm—the *biceps* on the front and top, and the *triceps* located toward the back and bottom of the arm.

The biceps, joined visually with the *brachialis* muscle, is the most prominent muscle in the arm, and many a strong man's claim to fame. Its major job is to flex the forearm. Opposing it is the triceps, named for its three distinct heads. Varying in size, the *posterior head* is the longest, and all three end in a flat common tendon observable going into the elbow. Its major function is to extend the forearm.

Crossing the elbow joint are two muscle masses that help with both flexing and rotating the forearm. Moving from the outside of the elbow toward the inside of the wrist in a long diagonal is a mass composed of the *brachioradialis* and the *extensor carpi radialis longus*. This muscle grouping forms a very distinct oblique angle that defines the upper contour of the forearm from most positions. Going in the opposite

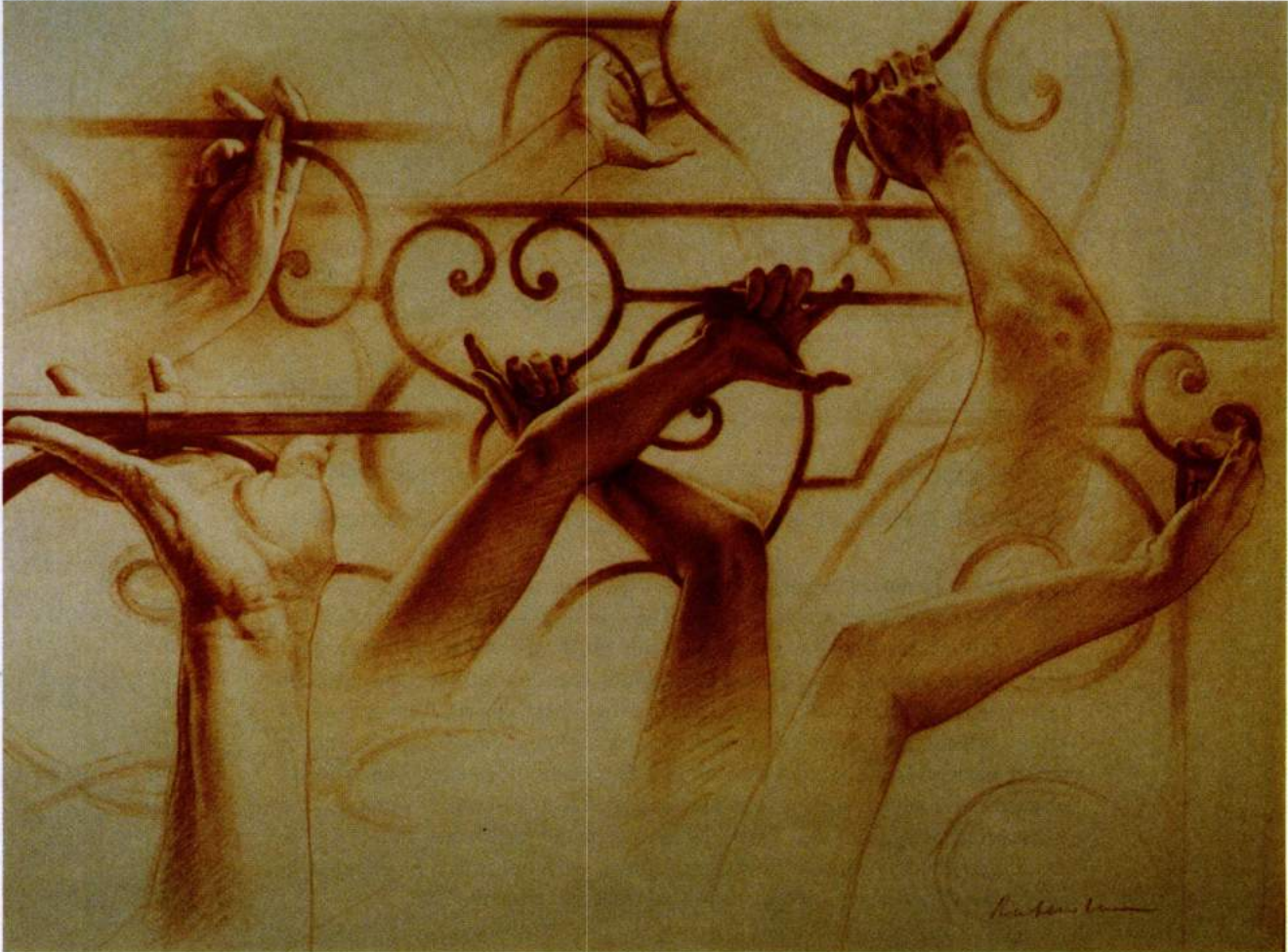
direction and visible near the elbow is the smaller mass of the *pronator teres*. The opposition of these two angles forms the distinctive shape of the inside of the elbow.

The forearm proper can be divided into muscles that either flex or extend the wrist and hand, although both aid in rotation as well. The *flexors* are the more powerful group and take up about two thirds of the mass of the forearm. That is why you can close your hand much more powerfully than you can open it. The *extensor* group, although smaller, is situated slightly higher up on the forearm, due to the fact that some of its muscles cross the elbow joint. Since both the flexors and extensors have their fleshy masses closer to the elbow, the upper portion of the forearm is fuller and rounder, while the wrist is slimmer and more squared-off where the muscles have become thin and tendinous.

Sarah XXI

2004, red chalk, 21 x 27.

Artists aim to understand anatomy so that they can use the body for their own expressive purposes. The arm can be unspeakably lovely and, in this case, is the stalk that blossoms into the flower of the hand.



Subcutaneous Landmarks

Much of the bony structure of the arm is *subcutaneous*, or observable directly beneath the skin. Unlike other parts of the body, this makes it relatively easy to find and draw. The whole elbow joint—made up of the inner and outer *epicondyles* of the humerus and the *olecranon* process of the ulna—are readily observable, as is the entire length of the ulna, from the elbow all the way to its small head on the top of the wrist. This crestlike ridge conveniently divides the flexor and extensor groups. If you can locate this landmark, you know immediately where you are on the form, no matter which way the arm is rotated. Like the ulna, the radius has a small head observable on the side of the wrist, slightly lower than the ulna. Because the radius can run either parallel or across the ulna, remembering that the radius is always on the thumb side will help you keep the bone structure straight.

Tapering

Remarkably powerful and agile, our arms are also infinitely graceful. One of the things that makes them so is their tapering movement, both in the whole and in the parts. The arm as a whole tapers supply from the shoulder to the wrist. But in addition, the upper arm and the forearm each taper individually from top to bottom, setting up an undulating rhythm of swelling and narrowing that is amazingly beautiful.

Because the different parts can bend, twist, and rotate in so many different directions, the gestures of the arm are infinite. Striking, embracing, and shielding, the arms express the sweep of complex human emotions. ❖