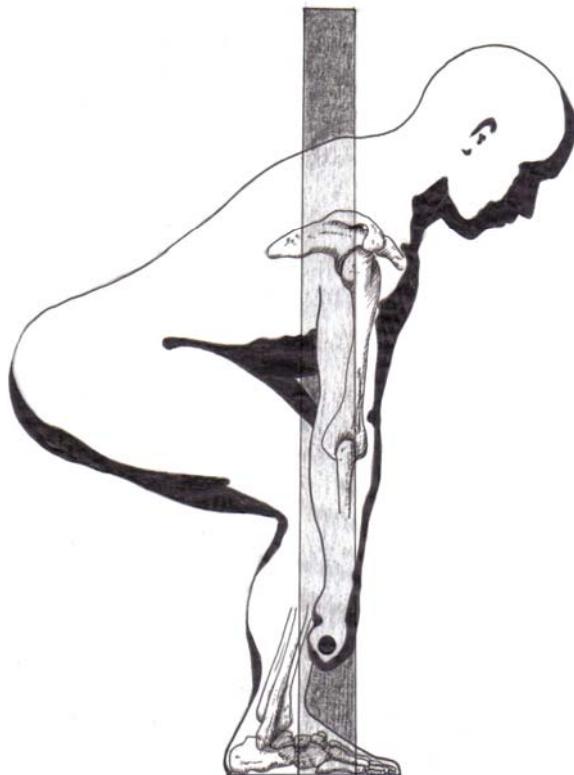


## The Deadlift

In the starting position, the shoulders will be in front of the bar, and the arms will *not* be perpendicular to the floor. The force transferred up the back is directed to the arms through the shoulder blades, and they lie at a slight angle forward, from the medial (spine) side to the lateral (arm) side. The upper arm articulates with the scapula at the most lateral end, at the ball and socket joint called the glenoid, and the front of the shoulder will be forward of the bar when the spine of the scapula is in the correct position vertically above the bar (fig. 4-20). The arms in this non-vertical position would, at the urging of gravity, very much like to swing out away from the shins to a vertical position. This would pull the center of gravity forward and cause problems, and fortunately this does not happen. The latissimus dorsi muscles have a major role in the deadlift: from the floor, the lat pulls back on the humerus to keep the arms from swinging forward away from the shins, and acts as an anchor on the upper part of the humerus to maintain the position of the bar directly under the shoulder blades until the bar crosses above the knees. The lats act in an essentially isometric way from the floor to the point where hip extension allows the arms to become vertical. At this point tension comes off the lats, and as the back becomes vertical, the arms drag the bar into the thighs as they assume an angle *behind* the vertical, opposite the starting position. During this entire process, force continues to be transferred from the hips and legs up the spine to the shoulder blades and down the arms to the bar, and the traps act as the anchor for this process.



**Figure 4-20.** The skeletal relationships in the deadlift. The bar is touching the shins with the feet flat on the floor in a position that places the bar over the middle of the foot, the back is in good lumbar and thoracic extension, the scapula is directly over the bar, and the elbows are completely straight.

There are three angles to consider when looking at the deadlift, that result from this correct position: the angle at the knee, formed by the tibia and the femur, the angle at the hip, defined by the femur and the plane of the torso (assuming that the lumbar spine is locked in extension), and the back angle, that the plane of the torso makes with the floor (fig. 4-21). In a *correct* deadlift, the knee angle is the first to change as the bar comes off the floor, indicating that the quadriceps are working to extend the knee under load. The back should maintain the same angle with the floor as it keeps the scapulas over the bar until it passes the knees; the hamstrings “anchor” the pelvis so that this angle can be maintained (more on this later). The hip angle opens up only slightly as the femur gets more vertical. It is only after the bar clears the knees that the back angle, and consequently the hip angle, begins to change significantly (fig. 4-22). As hip extension begins to increase, the hip extensors – the glutes and hamstrings – become the predominant movers of the load, the quads having essentially finished their work of straightening the knee. The role of the back muscles during the pull is to hold the trunk rigid and the shoulder blades back in adduction so that force generated by knee and hip