So intimately interwoven are mind and body that it has been said that there can be no psychological event without a resulting somatic (bodily) event, and no somatic event without a psychological event.

The stress response represents the epitome of mind–body interrelationships. Indeed, to understand the stress response one must possess a fundamental understanding not only of psychology but of physiology as well.

The purpose of this chapter is twofold: (1) to describe the neurological foundations of the stress response, and (2) to trace sequentially the active involvement of the psychophysiological mechanisms which represent the stress-response process.

In writing this chapter we have attempted to avoid needless complexity, yet elected to include information which may, at this point, seem excessively detailed or peripheral to the thrust of the chapter. Our rationale for including such information is simply the observation that some points, now seemingly irrelevant, will provide useful insight when later combined with clinical experience treating the stress response.
THE ORGANIZATION OF THE HUMAN NERVOUS SYSTEMS

In order to understand the stress response, we must first understand its foundations, which reside in the fundamental anatomy and physiology of the human nervous systems.

The basic anatomical unit which constitutes the nervous systems is the neuron (see Figure 2). The function of the neuron is to conduct sensory, motor, or regulatory signals throughout the body. The neuron consists of three basic functional subunits: the dendrites, which receive incoming signals; the neural cell body, or soma, which contains the nucleus of the cell; and the axon, which conducts signal impulses away from the cell body and relays the signal to another dendrite or to a target organ. Before this relay occurs, however, the impulse must be transmitted across a space called a synapse. To accomplish this crossing, the impulse utilizes various neurotransmitters, which are nothing more than chemical substances released from storage at the terminal branches (called telodendria) of the axon. The neurotransmitting substances cross the synaptic gap and allow the impulse to continue its transmission. The neurotransmitters of primary interest in the study of stress are noradrenalin (norepinephrine) and acetylcholine.

The actual transmission of the impulses along the neuron is based on a complex process of electrochemical conduction. This electrochemical activity occurs by the movement of ions across the membrane of the axon (see Figure 3). The conduction of impulses yields a measurable electrical event, seen as the increase in voltage occurring in the action-potential spike during depolarization. The measurable