INTRODUCTION

Focal epilepsies of the parietal and occipital lobes are rare. In a retrospective study of 320 individuals who received surgical treatment for epilepsy at the Montreal Neurological Institute between 1929 and 1980, Rasmussen\(^{12}\) found that 7% had epileptogenic cortex primarily in the sensorimotor area (Rasmussen regards the pre- and post-central gyrus as a single functional unit), and 6% had epileptogenic cortex in the parietal lobe behind the post-central gyrus. Based on 160 cases of focal epilepsy that could be classified, Manford et al.\(^{11}\) found that 6.3% had seizures of parietal lobe origin.

The incidence of occipital-lobe epilepsy appears to be approximately 6–8% of individuals with focal epilepsy.\(^{11}\) However, only 1% of the surgical cases of intractable epilepsy reviewed by Rasmussen\(^{12}\) involved excisions primarily in the occipital lobe. Epileptogenic activity of occipital-lobe origin appears to be more common in children than in adults.\(^{18}\) Benign epileptic syndromes of childhood, which tend to resolve with development, account in part for this discrepancy. These syndromes are described later in the chapter.

Seizures originating in the parietal lobe typically spread rapidly, either anteriorly to the frontal cortex or posteriorly to the occipital lobe.\(^{19,20}\) Characteristics of a seizure originating in the parietal lobes therefore may change depending on the direction of
seizure propagation. Likewise, epileptogenic activity originating in the occipital lobes can spread to other brain regions. Seizure spread from the occipital lobes to the ipsilateral temporal lobe is especially common.\textsuperscript{15,18} The rapid spread of epileptic discharge can make it difficult to pinpoint the seizure onset to the parietal or occipital lobes.

1. NEUROPSYCHOLOGY OF THE PARIETAL AND OCCIPITAL LOBES

There has been little systematic study of the neuropsychology of the parietal and occipital epilepsies, perhaps due to their relatively low incidence, and to the difficulty in localizing the seizures originating from these areas. The kinds of neuropsychological phenomena that could be expected to be associated with epileptic activity in the parietal and occipital lobes can, however, be understood in relation to the roles that these regions play in normal cognitive and sensory function. These roles are discussed briefly below.

1.1. Parietal-Lobe Function

The parietal lobes support numerous cognitive and sensory functions. Each parietal lobe can be divided into several separate neuroanatomical regions, based on histological differences and divergent neural responses. The primary somatosensory region, located in the postcentral gyrus (Brodmann’s areas 1, 2, and 3), is involved in the reception of somesthetic information. The body surface is spatially represented in the primary somatosensory cortex, such that distinct cortical regions correspond to specific body parts. In addition to receiving somesthetic information directly from the ventral posterior thalamus, the primary somatosensory region plays a role in motor functioning. The primary motor and somatosensory areas are highly interconnected, allowing for precise motor responses based on somesthetic feedback. Damage to the primary somatosensory region of the parietal lobe can give rise to a loss of sensation contralateral to the damaged hemisphere, an inability to determine shape or texture, and/or an inability to recognize objects by touch alone (astereognosis).\textsuperscript{2,10} Astereognostic deficits, however, may require specific damage to the cortical region representing the hand.\textsuperscript{13} Damage to the primary somatosensory area can also result in motor problems, including paresis, inaccurate motor movements, and reduced motor speed.\textsuperscript{8}

Adjacent to the primary somatosensory region is the somesthetic association area (Brodmann’s area 5). This region receives input from both the ipsilateral and the contralateral primary somatosensory regions, as well as from the motor association areas of the frontal lobes. The somesthetic association area contributes to complex hand manipulation, the ascertainment of body position in space, and tactile discrimination. Damage to the region can result in disturbances similar to those after damage to the primary somatosensory cortex. One difference, however, is that an affected individual may be sensitive to touch, yet be unable to determine the location of the stimulus.\textsuperscript{10} Disturbances in pain sensitivity also have been reported after damage to the somesthetic association area 5.

The superior-posterior aspect of the parietal lobe (Brodmann’s area 7) is involved in the integration of visual, motor, and somesthetic input. The region helps individuals to perceive visual-spatial properties, including figure-ground relationships, depth, and spatial location. Epileptogenic activity in this region may lead to spatial problems, as