In contrast to the widely held view that radiologic normal variants are of no clinical significance, many of the anatomical variants of the skeletal system may, in fact, be responsible for symptoms. Three groups of reputedly normal variants are presented: Group 1 consists of ossicles that, from the onset, may represent the sequelae of chronic repetitious trauma; group 2 is composed of normal variants in which the presence of a congenital synchondrosis may predispose to injury from chronic repetitious trauma; and group 3 consists of ossicles that in a variety of ways predispose to local and premature degenerative changes. These ossicles may be asymptomatic, however, radionuclide bone scanning is crucial in evaluating the significance of the ossicles in the symptomatic patient.

GROUP 1
“Normal variants” that may represent a chronic chondro-osseous disruption

Bipartite patella. The bipartite patella, which was first described by Gruber in 1883, is a common radiographic finding. The ossification center is identified at the superolateral pole (Figs. 1A and B). It usually is noted by age 12 and may persist into adult life. It is present in approximately 2% of patients, is unilateral more frequently than bilateral, and occurs nine times more commonly in boys than in girls (3, 4). Longitudinal studies to confirm or refute whether the accessory center ever unites with the body of the patella are not available. Trauma to the interface between the main and accessory ossification centers has been suggested as a cause of patella pain (5), and, in symptomatic patients, histologic studies have revealed changes in the interface consistent with chronic repeti-
tious trauma (6). In addition, the development of a superolateral ossicle in a previously normal-appearing patella has been identified (7, 8). This finding would suggest that the interface actually represents a chronic chondro-osseous tensile disruption, rather than traumatic changes in a congenital synchondrosis.

Anatomic studies have supported this concept (8). In an analysis of patella specimens removed from cadavers ranging in age from 3 to 16 years, Ogden (8) was able to identify a discrete superolateral ossification center in only two patellae. In neither instance could a history of direct trauma be obtained, but histologic studies of the interface in these specimens showed changes compatible with chronic repetitious trauma. The bipartite patella appears to be analogous to the Sinding-Larsen-Johannson and Osgood-Schlatter lesions, both of which show similar histologic findings (9) and are now considered to result from chronic repetitious trauma. Indeed, if earlier physicians had chosen to identify these ossicles by using the anatomic terms “os infrapatellare” and “os supratuberculare” rather than these eponyms the analogy would be even more striking. Like these lesions, the bipartite patella may, or may not, be painful. Tc-99m MDP bone scanning has been shown to be of value in assessing the significance of a bipartite patella in a symptomatic patient (Fig. 1C) (8). The painful bipartite patella, like painful ununited fractures, may require surgical or nonsurgical treatment.

**Dorsal defect of the patella.** The dorsal defect of the patella is a characteristic, well-defined lytic lesion that may be noted in the superolateral aspect of the patella (Fig. 2). In 1976, Haswell and coworkers (10) described 16 cases. The lesions were circular, frequently showed a sclerotic border, and ranged in size from 4-26 mm in diameter, averaging 9 mm. They may frequently be obscured in the frontal projection and are more satisfactorily shown in the lateral or tunnel projections, or by tomography. Twelve of the 16 patients were males and four females. Twelve were in their second decade. The lesion was bilateral in four patients, in the left patella in seven, and in five patients was noted in the right patella. Five cases were followed radiographically. Regression, as indicated by a decrease in size and an increase in sclerosis, was noted over a 3- to 5-month period in three of these patients. Although five of the 16 were symptomatic and a biopsy in one patient revealed “repair without inflammation,” the