Near the top of the Te Anga sequence in the central part of the area the mudstone may contain a significant proportion of glauconite. The rock in which this occurs is rather unusual and consists of small lenses of calcareous mudstone interspersed among the more glauconitic parts. It would appear that the original sediment was calcareous mud that had been extensively worked by infaunal organisms, the glauconite pellets being altered faecal pellets. Similar concentrations of glauconite were noted at S11 in the middle of the sequence.

Facies TA3: In the lower Mangawharawhara Valley the upper 15ft of the subgroup consists of sandy, silty limestone which grades down into the fine, less calcareous rocks of Facies TA2. These rocks are assigned to Facies TA3 and are also present at S7 and S8, at the top of the Te Anga.

CASTLE CRAIG SUBGROUP

Limestones of the Castle Craig Subgroup form the bulk of the Te Kuiti Group in the west Piopio area. Two formations are recognised within the subgroup and are correlated with the Orahiri and Otorohanga formations at Worth's Quarry, Te Kuiti (the type locality of these formations) on the basis of gross lithologic and stratigraphic similarities as described by Kear and Schofield (1959). No trace of the Waitomo Sandstone, which separates these formations at Worth's Quarry, could be found in the area.

It is proposed to designate Section S11 as the reference section for the subgroup in the area. A detailed stratigraphic column of this section is shown in Fig. 11 along with other columns for the subgroup. Relations between the units of the subgroup can be seen from Fig. 11 and from the diagrammatic cross-section, Fig. 9.

Orahiri Limestone

The Orahiri Limestone is composed of thick calcareous sandstones and sandy biosparites which grade up with decreasing terrigenous sand content, into relatively pure biosparites and then into biomicrites containing large oyster shells. Three members, each new, are recognised and are defined at their type locality, S11.

MEMBER A: *Type description*: At the type locality 40ft of partially leached limestone is found directly above the Te Anga Subgroup. Leaching has taken place in such a way that irregular lenses of hard sandy biosparite (up to 6in thick and 4–6ft long) are isolated in a soft, partially-leached, iron-stained sandstone which has weathered back leaving the hard lenses protruding from the cliff (Pl. 2, Fig. 1). Cross-bedding occurs in one of these lenses near the base. The contact with the overlying massive sandy limestones is sharp, but could not be examined because of its inaccessible position on the cliff face.

Distribution and content: The name "banded" limestone has been coined for the peculiar partly-leached limestones that constitute most of Member A and for similar rocks of Member B. The banded limestones of Member A are present throughout the area where the Orahiri Limestone is thickest (Fig. 12) and attain a maximum thickness of about 40ft. Some difference is seen in outcrop at different localities and the "hard" bands may form a greater part of the sequence than those at the type locality. However, no particular band forms a continuous horizon for any distance. Cross-bedding is a feature of some of the hard bands at a number of localities, but is not confined to the hard bands; at one locality thin ($\frac{1}{8}$in) hard and soft bands alternate within a single cross-bedded unit. The various cross-bedded units observed show an average dip of 12–15° of the foreset laminae and indicate current movement from south to west quadrant.

In thin section the banded limestones are very uniform and are sandy biosparites (Pl. 3, 1). The terrigenous elements are dominantly angular quartz and feldspar and are moderately well sorted. The most obvious skeletal remains are echinodermal plates, foraminiferal tests, and algal fragments. Polyzoan material is wide-