

Arena Gneiss and Kandy Gneiss - A proposed subdivision of the Highland Series around Kandy, and its significance

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Abstract: All the gneisses of the Kandy area have been generally regarded as part of the "Highland Series" of the Sri Lankan Precambrian metamorphic complex. Nevertheless, notable variations in lithology are mentioned in the literature, especially between rocks enclosed in the so-called "arenas" and those outside these synformal infolds. This paper reviews the characteristics of the "Kandy Gneiss" and "Arena Gneiss" and concludes that, in addition to major lithological contrasts between the mainly metasedimentary Kandy Gneiss and largely meta-igneous (perhaps metavolcanic) Arena Gneiss, there are also great differences in structural style and, less obviously, in metamorphic features. Thus, contrasts in the scale and form of major folds result in widespread structural discontinuity between the two groups of gneiss, and there are accompanying differences in the nature and attitudes of minor structures such as lineations. The widespread occurrence of apparently early-formed orthopyroxene in Arena hornblende-biotite gneisses has not been generally recognized. It is differentiated here from late orthopyroxene in veins, possibly related to the regional "incipient charnockitisation" event. Early metamorphism of Arena Gneiss may have peaked at lower grade (hornblende granulite facies) than early metamorphism in the Kandy Gneiss (granulite facies), and the metamorphic history of the Arena Gneiss perhaps lacks the early, high pressure episode for which there is evidence in some Kandy Gneiss.

Amongst possible explanations for these various differences, hypotheses based on lithologically-controlled disharmonic folding and variable burial depth cannot be as yet rejected, but more likely explanations involve either early (pre-D₃) unconformity between a volcanic cover (precursor of the Arena Gneiss) and a high-grade metamorphic basement (the future Kandy Gneiss), or the structural juxtaposition of contrasted terranes by faulting prior to D₃ folding. Whatever the correct structural interpretation may be, the differences between Arena and Kandy Gneiss seem to justify separate lithostratigraphic designations.