

19.2-4 DICHROIC AND TRICHROIC SYMMETRY OF DIAMOND CLAN DESIGNS IN THE ABORIGINAL BARK PAINTINGS FROM N.E. ARNHAM LAND, AUSTRALIA
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During the search for good teaching examples of coloured symmetry we have found a wealth of approaches to these problems in the Aboriginal bark paintings. They represent rectangular pieces of tree bark, usually divided into several compartments which are populated with mythological figures and animals. As a rule, the background of this figurative painting represents a clan design with a variety of possible interpretations. Most of the clan designs represent parallel-striped patterns but in three clans, Dhalwangu, Madarrpa and Gumatj, a variety of diamond designs are dominant.

The diamond designs always represent a tiling of plane by diamonds situated in the special positions (a) of the plane group $cmm2$ and are separated by thin boundaries. In all cases flat coloured rows of diamonds alternate with rows filled with shimmering colours which are produced by cross-hatching of colour lines with white lines. Except for the simplest cases that can be interpreted using one unit mesh and dichroic plane groups $p_c, mm2$, $p_b, mm2$ and $p_b, m1$, the unit mesh of the flat-coloured pattern does not coincide with that of the cross-hatched pattern (they are not translationengleich); often the two patterns display different symmetries. The flat-coloured pattern can be monochroic, $pmm2$, or dichroic, $p_b, mm2$ (red and black, never white). The cross-hatched pattern may be mono-, di-, or trichroic (red, black and white); the dichroic cases may have their unit mesh expanded by regular intercalation of stripes of white diamonds in special positions of the respective dichroic groups. The spectrum of colouring schemes for the cross-hatched patterns is rich: $p_b, mm2$, $p_a, mm2$, $c_a, mm2$ (often expanded), $p_b(3), m1$ or even $p_a(3), b(3), 1$ with diagonal colour modulation.

Except for an older example, in which the diamonds are divided into three, coloured compartments (dichroic symmetry $p2'$), no attempts were observed to divide the interior of diamonds into differently coloured portions. Thus, a number of dichroic and trichroic groups which can be derived from $cmm2$ or $pmm2$ by such colouring were not observed. The complicated colour symmetry as well as the dynamic character and visual beauty of these clan designs result from straightforward application of two independent modulation waves to two subsets of the uncoloured, simple and highly symmetrical fundamental pattern. In its colouring schemes the ornamental Aboriginal art of N.E. Arnhem Land compares favourably with similar products of Moorish, Egyptian and other sophisticated art traditions.