

THE WIDER TECTONO-MAGMATIC CONTEXT OF THE CHILWA ALKALINE PROVINCE, MALAWI.

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Chilwa Island, the first carbonatite recognised in Africa, gave its name to the classic Chilwa Igneous Province of major syenite plutons and separate carbonatites (137-105 Ma) in the Malawi Rift, extending southwards to Muambe (Mozambique), area 20000 km². Accumulating discoveries and age determinations are showing that the province extends westwards along the Zambesi, and thence northeastwards along the Luangwa (Zambia) to Rungwe (Tanzania). Thus the Chilwa event affected an area at least 213000 km², defined by the triangular rift pattern of the Malawi (N-S)-lower Zambesi (E-W)-Luangwa (NE-SW) rifts. These rifts follow ancient lineaments that record multiple re-activation since their establishment as metamorphic structural belts in the Proterozoic. Any proposed geodynamic regimes to explain the activity must be constrained by timing, rift geometry, and remarkable parallels in the activity at widely separated complexes. Carbonatites, kimberlites, and lamproites represent diatremic release from the upper lithosphere mantle, associated with the rift re-activation. Additional constraints on syenite melt generation are cumulatively severe: hypotheses must account for eruption through granulitic crust, coincidence with major syenites in the Precambrian, and proximity to diatremic carbonatites. Parallels can be seen in other rifts, and the crucial requirement of special lithosphere conditions and chemistry for the extended Chilwa Province may also apply.