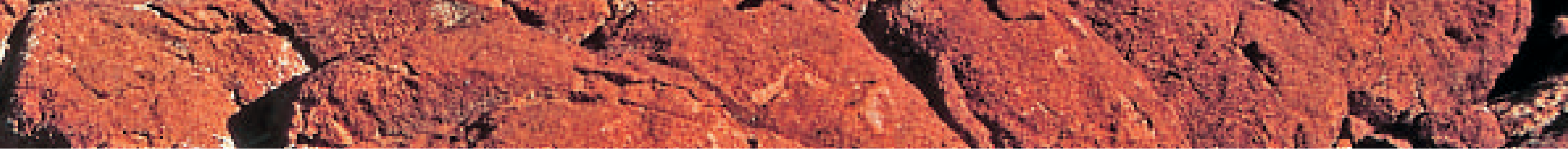

Geochronology of the Irumide Belt of Zambia reveals a punctuated magmatic history along the southeast margin of the Congo Craton and drastically alters previous perceptions of a continent-wide "Kibaran" event in central Africa.

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Zircon U-Pb SHRIMP geochronology of magmatic lithologies exposed in the Mesoproterozoic Irumide Belt of Zambia (Figure 1a) have unequivocally revealed a poly-magmatic character unlike any of the reported tectonothermal histories of other Mesoproterozoic belts in the region.

Rocks dated during this study include (see Figure 2): (1) limited Neoarchaean rocks emplaced at 2.73 Ga that represent the oldest rocks in the Bangweulu Block (Kapiri Mposhi Granite Gneiss, labelled KMP on Figure 1b); (2) ca. 2.05-1.85 Ga volcano-plutonic complexes and gneisses that constitute the most important components in the Bangweulu Block; (3) an extensive quartzite-metapelite succession with minor carbonate that comprises the Mporokoso (MpG, Figure 1b), Kanona (KnG, Figure 1b) and Manshya River (MrG, Figure 1b) groups, and was deposited at ca. 1.8 Ga as shown by dated interlayered volcanic tuffs and lavas in the Irumide Belt and by detrital age data; (4) granitoids emplaced between 1.65-1.55 Ga (Lukamfwa Hill Granite Gneiss, Musalango Gneiss and Lubu Granite Gneiss, labelled LHG, MsG and LGG on Figure 1b); (5) the Kasama Formation (KsF, Figure 1b), deposited between 1.43 and 1.05 Ga (second-cycle reworking of the Mporokoso Group); (6) voluminous syn- to post-kinematic Irumide granitoids, including the Chilubanama Granite and Bemba Batholith (CG and BB respectively, Figure 1b), which were emplaced between 1.05-0.95 Ga and accompanied by regional tectonism, metamorphism and local migmatisation at 1.02 Ga. A minor suite of 1.36-1.33 Ga anorogenic plutons (nepheline syenite and biotite granite) reported east of the Karoo graben (Figure 1b) and not included in this study, appear to have no time-equivalents in the Irumide Belt itself.

Our new data show that no precise age correlation exists between the Irumide Belt and the Kibaran Belt, nor between the Irumide Belt and Choma-Kalomo Block (TSRC Publication #218), indicating strongly divergent geological histories for these terrains and refuting the notion of a single continent-wide system of Kibaran belts. The strongly dissimilar tectonic histories of the Irumide Belt and Choma-Kalomo

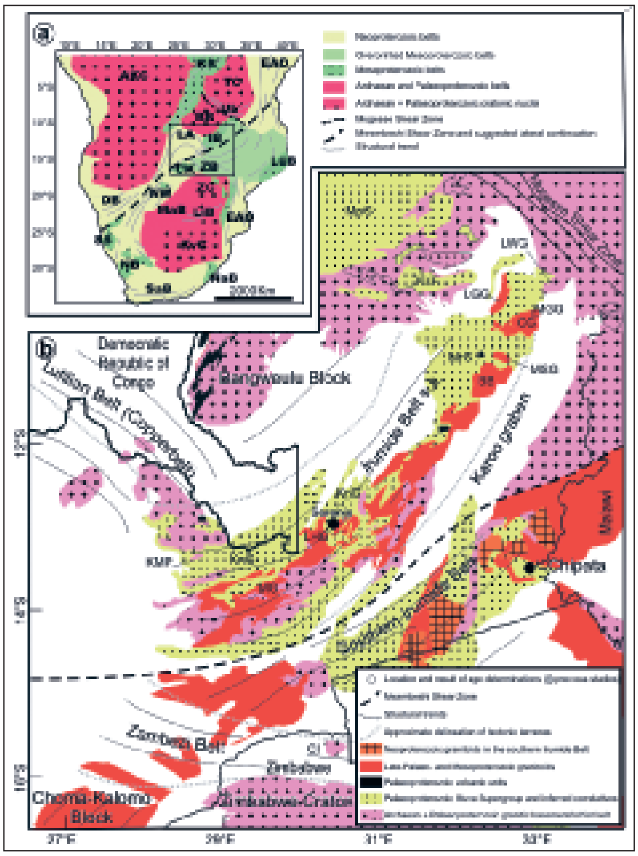

Figure 1: (a) Simplified regional tectonic map of central and southern Africa showing the approximate location of Figure 1(b); AKC=Angola-Kasai Craton; BB=Bangweulu Block; CK=Choma-Kalomo Block; DB=Damara Belt; EAO=East African Orogen; IB=Irumide Belt; KB=Kibaran Belt; KvC=Kaapvaal Craton; LA=Lufilian Belt; LiB=Limpopo Belt; LuB=foreland to the Lurio Belt; MaB=Magondi Belt; NaB=Natal Belt; NB=Namaqua Belt; NW=northwest Botswana Rift; SS=Sinclair Sequence; SaB=Saldania Belt; TC=Tanzania Craton; Ub=Ubendian-Usagaran Belt; ZB=Zambezi Belt; ZC=Zimbabwe Craton
(b) Regional geological map of central Zambia; BB=Bemba Batholith (also known as Lufila Granite); CG=Chilubanama Granite; KMP=Kapiri Mposhi Granite Gneiss; KnG=Kanona Group; KsF=Kasama Formation; LGG=Lubu Granite Gneiss; LHG=Lukamfwa Hill Granite Gneiss; LWG=Luwalizi Granite Gneiss; MG=Mkushi Gneiss; MGG=Mutangoshi Gneissic Granite; MpG=Mporokoso Group; MrG=Manshya River Group.

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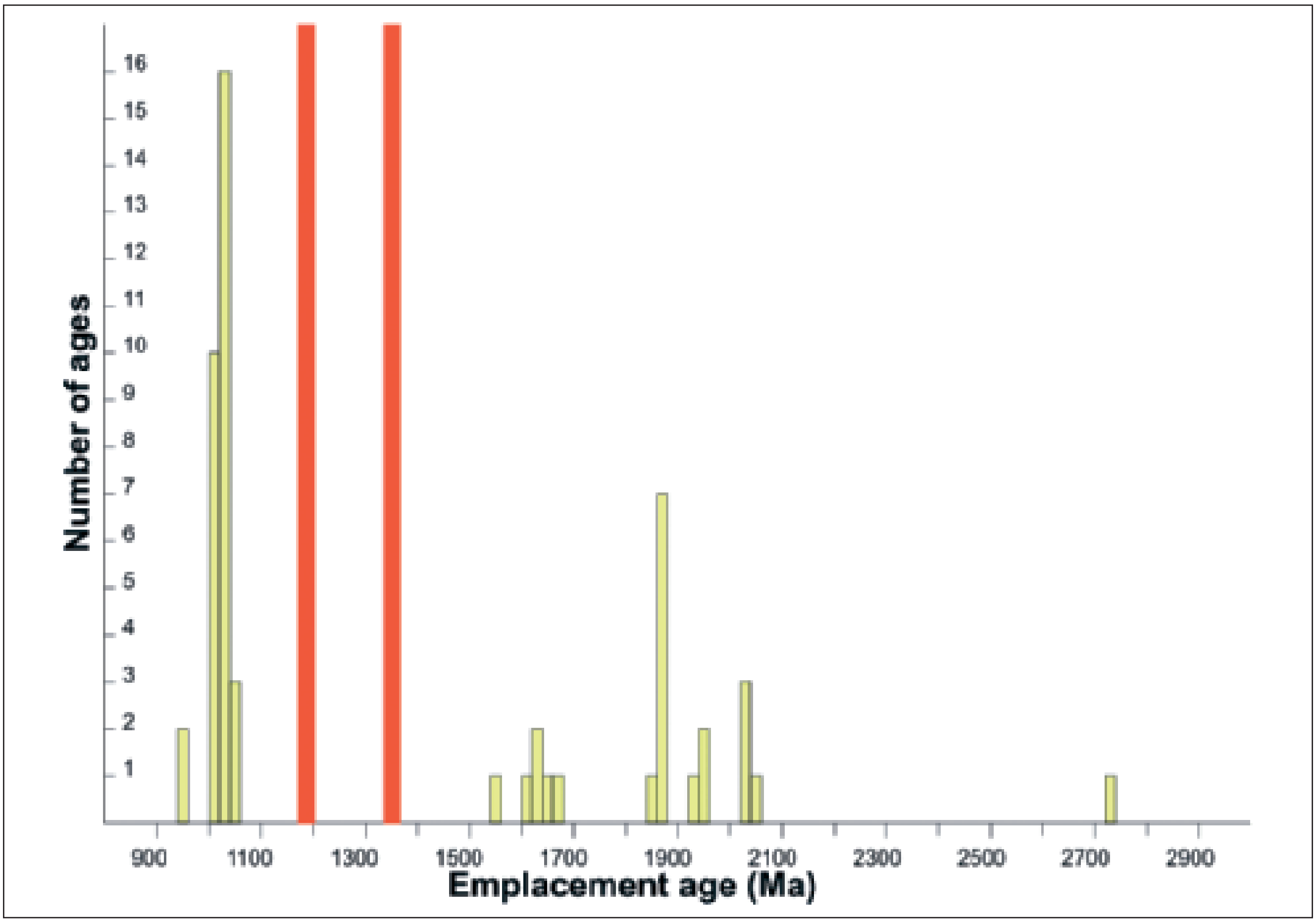

Figure 2: Histogram showing zircon U-Pb SHRIMP crystallisation ages for samples collected in the Irumide Belt and on the Bangweulu Block. Red rectangles indicate the approximate position of the time-spans of granite magmatism in the Choma-Kalomo Block and Kibaran Belt.

Block in particular, can best be explained by allowing significant separation of the Kalahari and Congo cratons prior to Neoproterozoic closure of the Damara-Lufilian-Zambezi ocean, and therefore support palaeogeographic models of Rodinia which place the Congo and Kalahari cratons as either distinct and separate fragments within the supercontinent, or show one or both of these two cratons external to Rodinia.

Currently, available data are not able to determine the tectonic setting nor the palaeogeographic location of the Irumide Belt, and as a result it is unclear whether it developed within Rodinia as a collisional orogen, at its margin as an accretionary orogen, or was not associated with Rodinia at all.

The Mozambique Belt, eastern Africa

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Development of an ArcView GIS – Access database (the East Africa Database, PhD Cutten 2004) has provided a research tool to archive new and published tectonically significant data from the Mozambique Belt in eastern Africa (Figure 1). The data include: igneous, metamorphic and sedimentary geochronology, metamorphic grade, P-T-t path, geochemistry, Nd isotopics, and structural geology. ArcView stores a digital map showing the regional distribution of areal data features