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# How far does the cryptic Mawson palaeocontinent extend within East Antarctica and was it sourced to form a Columbian cover in the Princess Elizabeth Land?

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The Mawson palaeocontinent comprises Gawler Craton in Australia, Terre Adélie Craton in East Antarctica, [3] and Miller Range area in Transantarctic Mountains [4]. The Mawson palaeocontinent experienced ca 2550–2430 Ma, ca 2000 Ma, ca 1850, ca 1700 Ma, and ca 1600–1550 Ma tectonomagmatic activities best evidenced within Gawler Craton [7]. Some authors considered the Wilkes Province of East Antarctica [4] to be ca 1500–1400 Ma juvenile crust accreted to the Terre Adélie Craton and included it with the latter, thus defining the Mawson palaeocontinent as extending as far as the Bunger Hills area [5, 8]. Indeed, a ca 1700 Ma age of an orthogneiss protolith [9] and ca 1800–1600 Ma inherited zircons in the Bunger Hills area [1] argue for the late Palaeoproterozoic connection of the Wilkes Province and Mawson palaeocontinent. Tectonomagmatic activities in the ranges of ca 2500–2400 Ma, 2250–1950 Ma, and ca 1800–1600 Ma were also dated from the southern Prince Charles Mountains (PCM) [6]. Finding of ca 2000–1800 Ma zircons entrained by Gaussberg volcanic rocks [7] makes a link between south PCM and Mawson palaeocontinent.

Here we report new U-Pb (LA-ICP-MS) data on detrital zircons from high-grade metasedimentary rocks from the PCM and the Princess Elizabeth Land (PEL), parts of the Rayner Province. These data show that partly this area includes, albeit as a minor portion, the Palaeoproterozoic sediments containing zircons dated at ca 2700−2100 Ma and 2000−1800 Ma (in Mt Meredith and Foster Nunataks) with metamorphic overgrowths as old as ca 1000 Ma. Younger metasediments (accumulation post-1400 Ma or post-1000 Ma) occur more widely in the PEL and also may contain detrital zircon grains of the Palaeoproterozoic age. All these rocks may have been derived or partly sourced from the Palaeoproterozoic complexes of the southern PCM.

The meso- to late Palaeoproterozoic ages (ca 2100–1600 Ma) obtained here and reported elsewhere for different Antarctic terrains are in a good agreement with the age of supercontinent Columbia (Nuna) formation at ca 1900–1800 Ma [2]. Some of sedimentary rocks in the PEL may represent either a post-orogenic Columbian molasse which may reflect extension in the cause of initial supercontinent break-up or a platform cover subsequently involved into Rodinia-age and/or Gondwana-age activation. A more extensive, than previously adopted, distribution of the Palaeoproterozoic complexes, which are thought to build up most of the Mawson palaeocontinent within East Antarctica, may be envisaged in the PEL. Such complexes may potentially underlay much of subglacial East Antarctica, making it part of the Palaeoproterozoic Columbia supercontinent. We thus tentatively propose that amalgamation of present the East Antarctic shield may have occurred in the cause of Columbia rather than Rodinia or Gondwana assembly.

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