Laser ICP-MS U/Pb analyses of detrital zircons from Proterozoic sediments in Bahia state, Brazil; implications for the evolution of the São Francisco craton prior to 3.3 Ga. C. W. Magee, J. M. Palin, and W. R. Taylor. Research School of Earth Sciences, Australian National University, Canberra ACT 2600, Australia. Charles.Magee@anu.edu.au

The mid-Proterozoic conglomerates in the Tombador formation of the Espinhaço supergroup have been mined for diamonds for almost 150 years, but the source of these diamonds has not been located. Green quartzite clasts in the Tombador have been correlated with Jacobina quartzites on the basis of morphology and paleocurrent reconstruction. The ages of detrital zircons from a quartzite in the Jacobina Ranges and several green quartzite clasts in the conglomerate of the Tombador Formation were determined.

Two hundred in situ analyses by Laser ICP-MS yielded 97 concordant ages with negligible common Pb. All of these ages are earlier than 3.28 Ga, and reflect derivation from the oldest known rocks in the São Francisco craton. Although the 3.4-3.45 Ga age populations of these two rocks are similar, the Jacobina has a large ~3.3 Ga population that is absent in the Tombador zircons. No zircons from the 2.8-2.5 Ga Jequié province, or from the 2.2-1.9 Ga Trans-Amazonian orogeny were detected in either sample. The broad similarity in age ranges (3.3-3.7 Ga), close similarity in the 3.4-3.45 age range, and differences in <3.4 and >3.5 Ga zircons suggest that these two sediments were derived from different areas of the same craton, and that their drainages shared some source regions.

The oldest rocks in the São Francisco Craton are the "old gray gneisses", from the basement of the Contendas-Mirante supracrustal belt. They crystallized between 3.3 and 3.5 Ga. However, their Nd and Sr isotopic composition suggests derivation from an unknown ~3.66 Ga source. Three of the zircons from the Tombador clast have ages between 3.6 and 3.7 Ga, and may have weathered from the source of these old Contendas-Mirante rocks. The oldest grain, dated at 3692±8 Ma, is the oldest zircon reported from South America to date.

The old gray gneisses are associated with younger gneisses and granodiorites in the 3.0-3.25 Ga age range. None of the 104 concordant ages from this study are younger than 3.28 Ga. However, most of the remaining discordant ages reflect variable late Paleozoic Pb loss, and have $^{206}Pb/^{207}Pb$ ages between 2.95 and 3.35 Ga. The younger gneisses and granodiorites in the Contendas-Mirante basement have only been dated using Rb-Sr and $^{206}Pb/^{207}Pb$ methods, which cannot detect discordance. We suggest that these rocks should be redated with a U/Pb system to determine whether or not their ages are different than that of old gray gneiss as a result of lead loss or metamorphic mobilization of Rb or Sr.