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Arc-continent collision: orogeny and continental growth

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The Southern Urals of Russia contain what is arguably one of the best-preserved examples of an arc-continent collision in any Paleozoic orogen. The arc-continent collision history recorded in the rocks of the Southern Urals began in the Early Devonian with the onset of intra-oceanic subduction and the formation of the Magnitogorsk Arc and ended with its collision with the margin of Baltica during the Late Devonian. The Baltica margin consisted of a basement that was composed predominantly of rocks of Archean and Proterozoic age that, by the time of arc-continent collision, was overlain by Cambrian, Ordovician, Silurian, and Devonian sediments interpreted to have been deposited in rift-related grabens on the continental slope and rise, and on the shallow marine platform. The Magnitogorsk Arc consists of Early to Late Devonian

island arc volcanic rocks and overlying volcaniclastic sediments. Arc-continent collision led to the development of an accretionary complex that includes shallowly and deeply subducted continental margin rocks, ophiolite fragments, and sediments that were deposited in a foreland-basin setting. The geochemistry of the Magnitogorsk Arc volcanic rocks, the structure of the arc-continent collision accretionary complex and the forearc, the high-pressure rocks beneath and along the suture zone, the mafic and ultra-mafic ophiolitic material, and the syn-tectonic sediments show that the Paleozoic tectonic processes recorded in the Southern Urals can be favorably compared with those in currently active settings such as the west Pacific.