Jeju is a volcanic field active since c. 1.2 Ma ago. Eruptive activity began with dispersed, basaltic, monogenetic, phreatomagmatic volcanism. Continuing monogenetic volcanism was later joined by more voluminous lava effusion events building a central steep composite shield. Samples from older (>0.8 Ma) and younger (<0.1 Ma) monogenetic centres were analysed for whole-rock major elements (XRF), trace elements (LA-ICPMS) and Sr-Nd-Pb isotopic compositions (MC-ICPMS). Pyroclastic products of monogenetic centres are dominantly alkali basaltic to trachybasaltic, whereas the more voluminous lava flows and domes of the central edifice consist of sub-alkali basalt and alkali basalt to trachyte. Early monogenetic centres are depleted in MgO, Cr and Ni reflecting considerable near-source olivine fractionation. By contrast, younger monogenetic magmas fractionated clinopyroxene + olivine at deeper levels. Isotopic compositions show little variation across the suite, but the younger monogenetic centres have generally lower $^{87}\text{Sr}/^{86}\text{Sr}$ and $^{208}\text{Pb}/^{204}\text{Pb}$ and higher $^{143}\text{Nd}/^{144}\text{Nd}$ than the older centres and sub-alkali lavas. Major and trace element and isotope data suggest a common, shallower source for older monogenetic magmas and sub-alkali lavas, compared to a deeper source for younger monogenetic magmas. We propose that field-scale mantle melting was initiated at a depth of near 2 GPa, followed by extension of the melting zone to 3-3.5 GPa, with a concomitant increase in the volume of melt derived from the shallower part of the system to produce the much more voluminous central edifice. Increasing melt production at shallow depths may be related to accelerated heat transfer resulting from deepening of the melting zone.