High-$T_c$ superconductivity does not originate in cuprate-planes.\(^1\) 

JOHN D. DOW, Arizona State U. — CuO\(_2\) planes are not needed for high-$T_c$ superconductivity, as demonstrated by Sr\(_2\)YRuO\(_6\) and Ba\(_2\)YRuO\(_6\), weakly doped on Ru sites with Cu, with onset $T_c$'s of 49K and 93K, but no cuprate-planes. Gd\(_{2-x}\)Ce\(_x\)Sr\(_2\)Cu\(_2\)RuO\(_{10}\) and GdSr\(_2\)Cu\(_2\)RuO\(_8\) do not superconduct in their cuprate-planes, which are magnetic, but in their SrO layers (with onset $T_c \approx 45$K). High-temperature superconductivity resides in SrO, BaO, or interstitial oxygen regions, not in cuprate-planes. In YBa\(_2\)Cu\(_3\)O\(_7\), Harshman et al. [1], using muon spectroscopy, found $s$-wave character, not $d$-wave character (to better than one percent) which measures the superconducting layers. This contradicts scanning tunneling microscopy and photoemission, which claim $d$-wave behavior after measuring near-surface layers (which often do not superconduct). High-temperature superconductivity originates in the BaO, SrO, or interstitial oxygen regions, not in the cuprate planes. [1] D. R. Harshman, et al., Phys. Rev. B 69, 174505 (2004).

\(^1\)Supported by ARO.

John D. Dow
Arizona State U.

Date submitted: 28 Nov 2005

Electronic form version 1.4