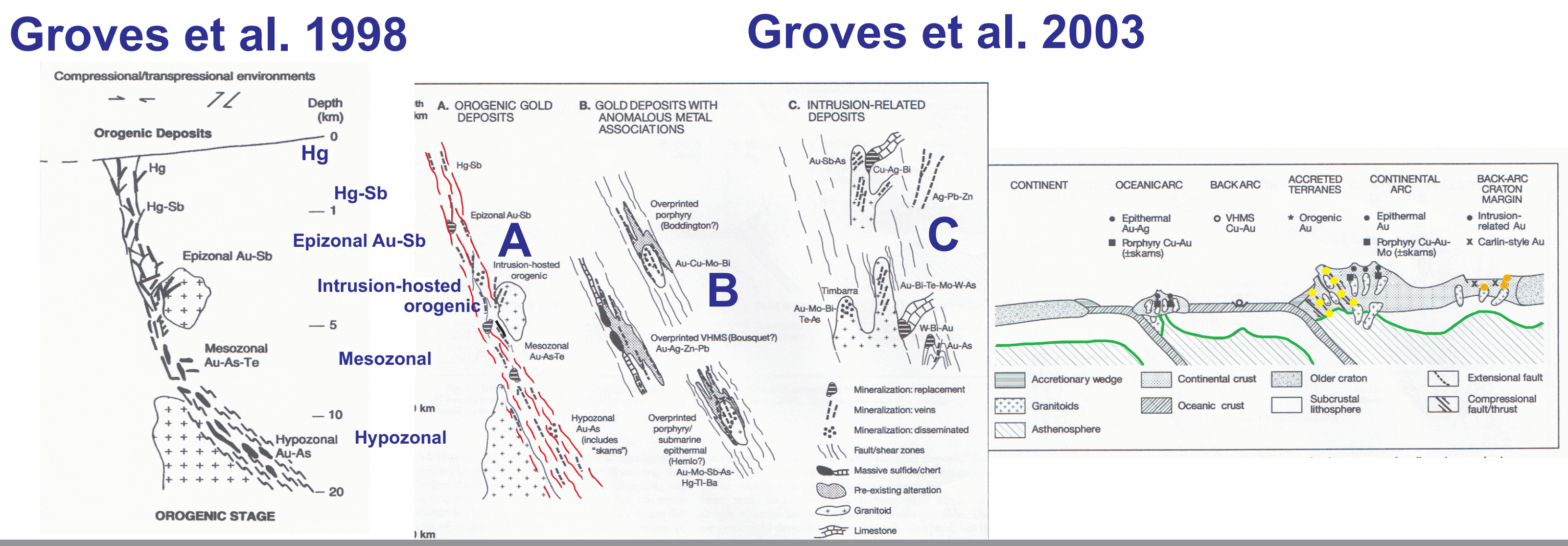


OROGENIC GOLD, INTRUSION-RELATED GOLD AND ASSOCIATED METALS - current models as a basis for further work

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Crustal environments in terms of depth of formation and structural setting

- A orogenic [gold] deposits
- B gold deposits with anomalous metal associations
- C intrusion-related gold deposits

Fig. 1

1 The continued ineffectiveness in the search for gold deposits in orogenic domains and related persisting controversies suggest incomplete model assumptions.

2 Current models as in Fig. 1 and Fig. 2a focus on the crust as the metal source.

3 Lateral juvenile additions to the crust are, however, not necessarily the only source of metal concentrations.

4 The Orogenic Ore Deposits comprise, in addition to those of gold, also deposits of antimony and mercury (Fig. 1).

5 Lang & Baker recognize the importance of the material contribution of the asthenosphere to Intrusion related gold deposits (Fig. 2b,c).

Intrusion-related gold systems

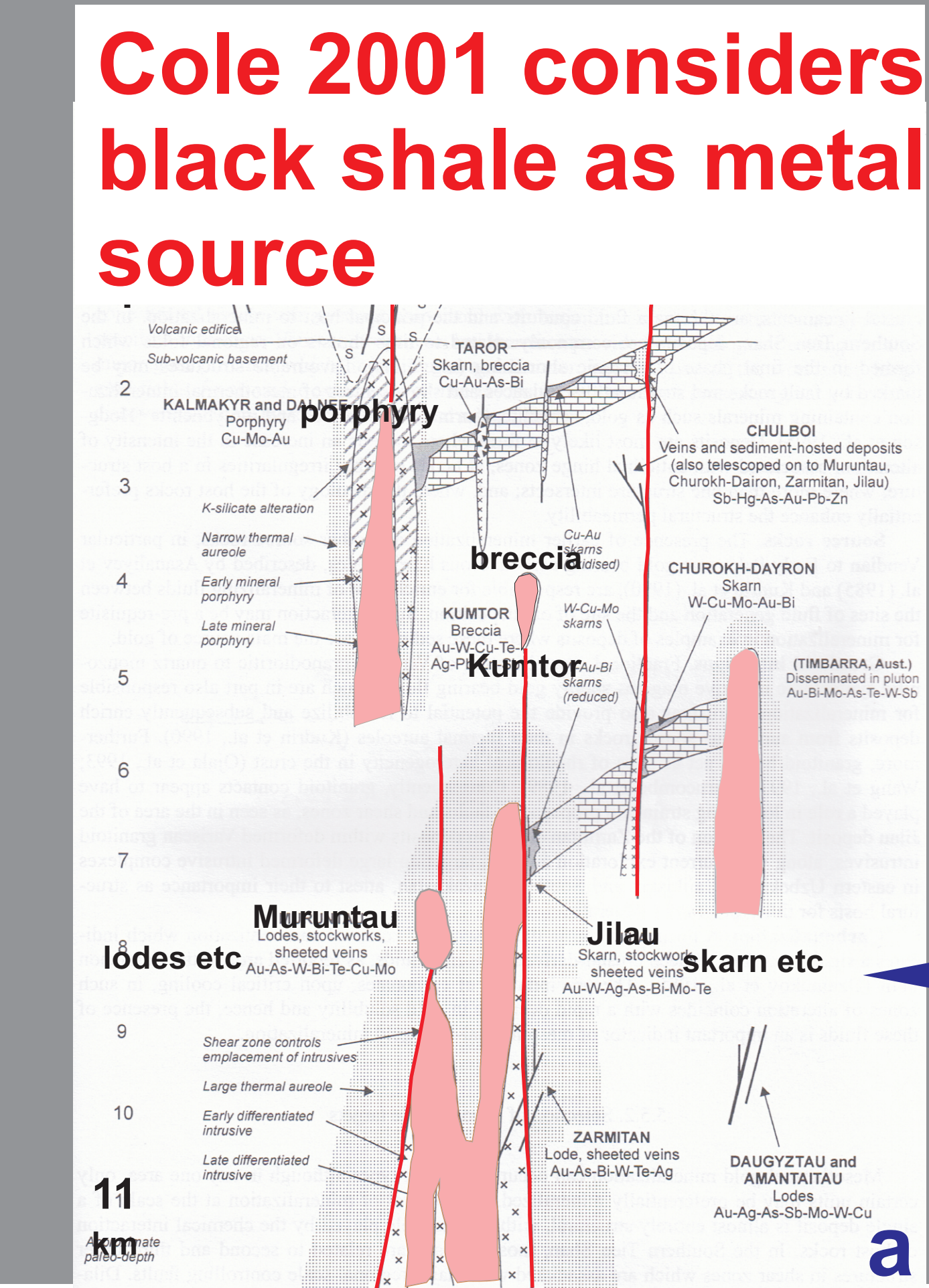
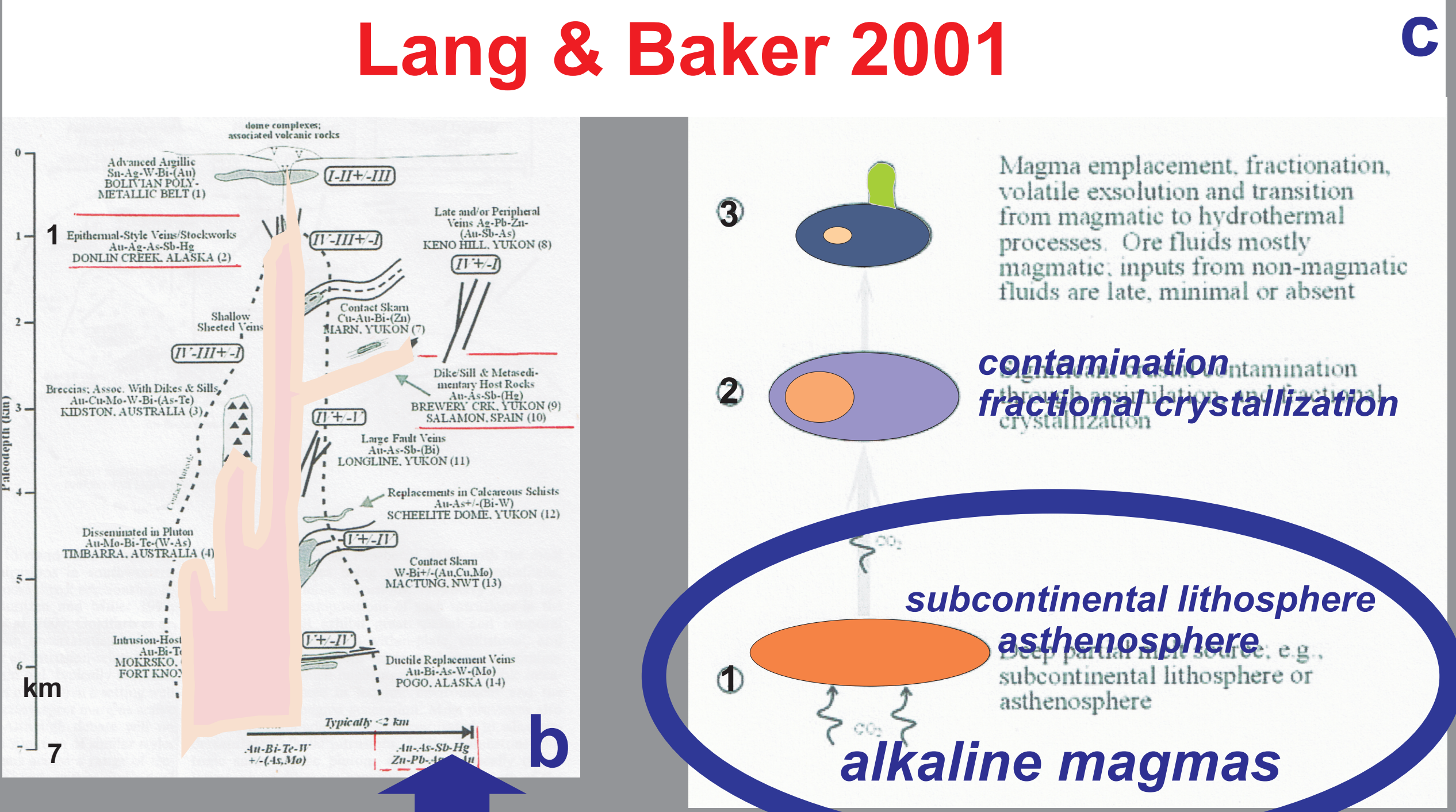


Fig. 2



6 The above proposal by Lang & Baker also proves to hold for Orogenic Ore Deposits if the other metals in these deposits, together with the ‘anomalous metals’, are taken into consideration as well.

Proposes *crustal continuum* model of granitoid-related gold deposits (Fig. 2a)

7 Examination of the distribution and setting of corresponding Hg±Sb±Au deposits suggests there are two groups of compelling arguments to look for the floor of the ore systems at least at the base of the continental lithosphere plates:

Material

- the tentatively suggested asthenospheric source of the alkaline mafic volcanics and mercury at Almadén (Higuera et al., 2000, 2005)
- the inferred asthenospheric source of late Palaeozoic alkaline basalts and associated A-type granites, coeval ultra-mafic intrusions and associated Cu-Ni deposits and Au deposits in the Tien Shan ranges (Konopelko et al., 2007; Mao et al., 2008; Pirajno et al., 2008)
- the concentration of Cu-Ni-PGE-Au at the top of the asthenosphere at Lanzo, northern Italy (Lorand et al., 1993)
- laboratory experiments of Karato & Jung (1998) and Pilet et al. (2008) on the evolution of partial melts in the asthenosphere

Structural

- the preferred distribution of both mesothermal Au deposits (Kerrick & Wyman, 1994) and epithermal Hg and Hg-Au deposits (this study) in translithospheric plate-bounding strike-slip zones
- the similarities in proposed settings of gold and mercury deposits in the Tien Shan and Coast Ranges, California (Konopelko et al., 2007)

8 I propose to expand the orogenic ore deposit model from crustal to lithospheric scale, both mechanically and fully materially.