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Editorial

Gold deposits of China: A special issue of ore geology reviews☆

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This volume of Ore Geology Reviews is dedicated to Dr Feng-Jun Nie and credits his significant contribution to understanding the ore deposits of China. In recent years, he has dedicated his life to the study of mineralization in the North China Craton and Central Asian Orogen to the north, and that is the focus of this volume.
谨将本《矿床地质论评》专辑献给聂凤军博士，以表彰他对中国矿床地质研究所做出的杰出贡献。聂凤军博士近年来一直致力于华北克拉通及其北部中亚造山带的成矿规律研究，这也是本专辑的焦点。

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China is currently positioned as the largest global producer of gold with a 2014 production of 450 t from predominantly epithermal deposits, which places it well ahead of production from other countries (Fig. 1; United States Geological Survey, 2015). Despite this strong position as a producer, China has gold reserves that are much smaller; of the 33,000 t of gold in global reserves, only 1900 t is in China (USGS, 2015). Zhang et al. (2015) report a study of the history and economics of gold mining in China, and their work reports reserve figures from Xu (2012), which are compliant with Chinese rule sets on classifications following the National codes on classification of mineral reserves and resources. There is no exact alignment of categories in the JORC and Chinese codes, so the comparisons must be treated with commensurate caution. Continued production of gold in China depends on continued exploration success, and this success is rooted in the technical excellence in discovery that is underpinned by sound geological principles and new knowledge.

Epithermal deposits are formed from meteoric hydrothermal with varying proportion of magmatic hydrothermal fluids, which are commonly driven by the magma's heat energy. Such deposits are generally formed in the Earth's crust at shallow depths with temperatures of <400° C and depths of ~2 km. Epithermal deposits have been classified as low sulfide-type, high sulfide-type and alkaline-type, alunite-kaolinite type (acidic sulfate type) and adularia-sericite type (Bonham, 1986; Heald et al., 1987; Pirajno, 2009). The tectonic setting for these epithermal gold deposits include continental-margin arcs and island-arcs, and back-arcs situated above subduction zones (e.g. Sillitoe, 2000; Hedenquist et al., 2000). They are dominantly distributed in circum-Pacific areas, Himalayas and the combined northern edge of the North China Craton (NAC) and the Central Asian Orogenic Belt (CAOB) immediately to the north of the NCC. An overview of gold mineral systems in China can be found in Pirajno (2014).

The northern edge of the NCC and the CAOB form a major gold endowed region on Earth hosting several large-scale gold deposits (Goldfarb and Santosh, 2014; Li et al., 2012a; Yang et al., 2003). Examples include Muruntau (175 Moz @ 3.5–11 g/t Au; Mao et al., 2004), Zarmitan (10 Moz @ 9.8 g/t Au; Abzalov, 2007), Kumtor (18 Moz @ 2–6 g/t Au; Mao et al., 2004), Haoyaoerhudong (148 t @ 0.62 g/t Au; Wang et al., 2014), Zhulazhaga (50 t @ 4 g/t Au; Ding et al., 2015–in this issue), and Bilihe (30 t @ 4.5 g/t Au; Qing et al., 2011). These deposits are hosted predominantly by Precambrian rocks, and are spatially and temporally associated with late Paleozoic felsic magmatism in the region (Mao et al., 2004; Abzalov, 2007; Qing et al., 2011; Wang et al., 2014; Ding et al., 2015–in this issue).

This volume of papers was designed to focus attention on the latest developments in understanding the geology of important gold deposits and gold producing areas in China with the aim to understand the regional structural, geochemical and geochronology setting for the mineralization. The papers cover a range of gold deposit types that link to a range of genetic models. The deposits are located across China and vary in contained gold reserves as shown in Fig. 2.

Bao et al. (2015–in this issue) describe the geology of the newly discovered ca. 99 Ma Gaosongshan epithermal gold deposit in the Lesser Hinggan Range of the Heilongjiang Province. The deposit is classified as an adularia-sericite epithermal deposit associated with tensional faulting and has a low-sulfide content with a high concentration of

☆ The citations in the text that relate to this special issue may be added at the stage of production of the journal issue.

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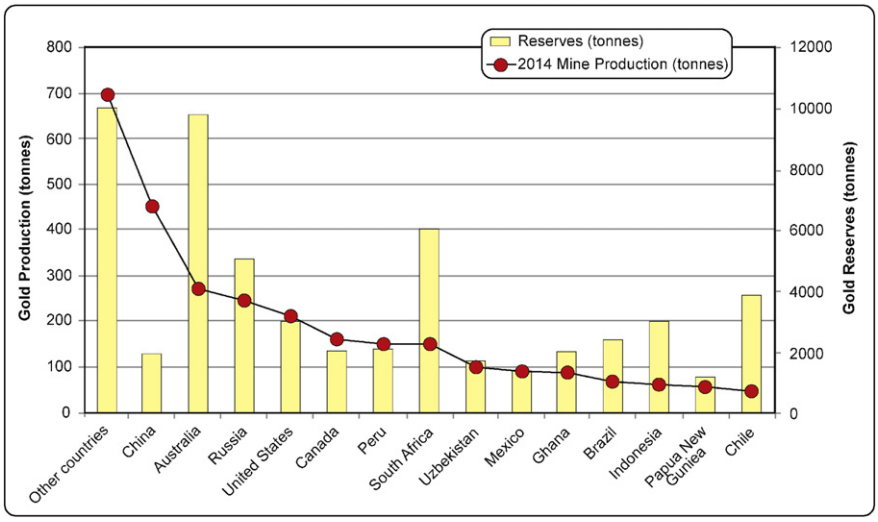

Fig. 1. Gold production and gold reserves by country. The data are sourced in USGS (2015) where metric units are used. Note that the Chinese definitions of the term "Reserve" are based on the Chinese Ministry of Lands and Resources classification scheme, and there is no direct alignment with the JORC classification system (Bucci, 2015). The authors of the papers in this volume have followed the Chinese rule-sets on reserve statements.

gold hosted by chalcedonic quartz, which makes the deposit both unique and economically important in the area.

Bao et al. (2015–in this issue) describe the geology of the Dongping gold deposit. Geochronology and isotope ratio data provide evidence for a genetic link between the formation of the deposit and two phases of hydrothermal activity. The contribution provides fluid inclusion and isotope data that support a mantle contribution to fluids from which gold mineralization was deposited.

Cai et al. (2015) report new structural data for the Baolun gold mine in Hainan Island, South China. Field mapping indicates five

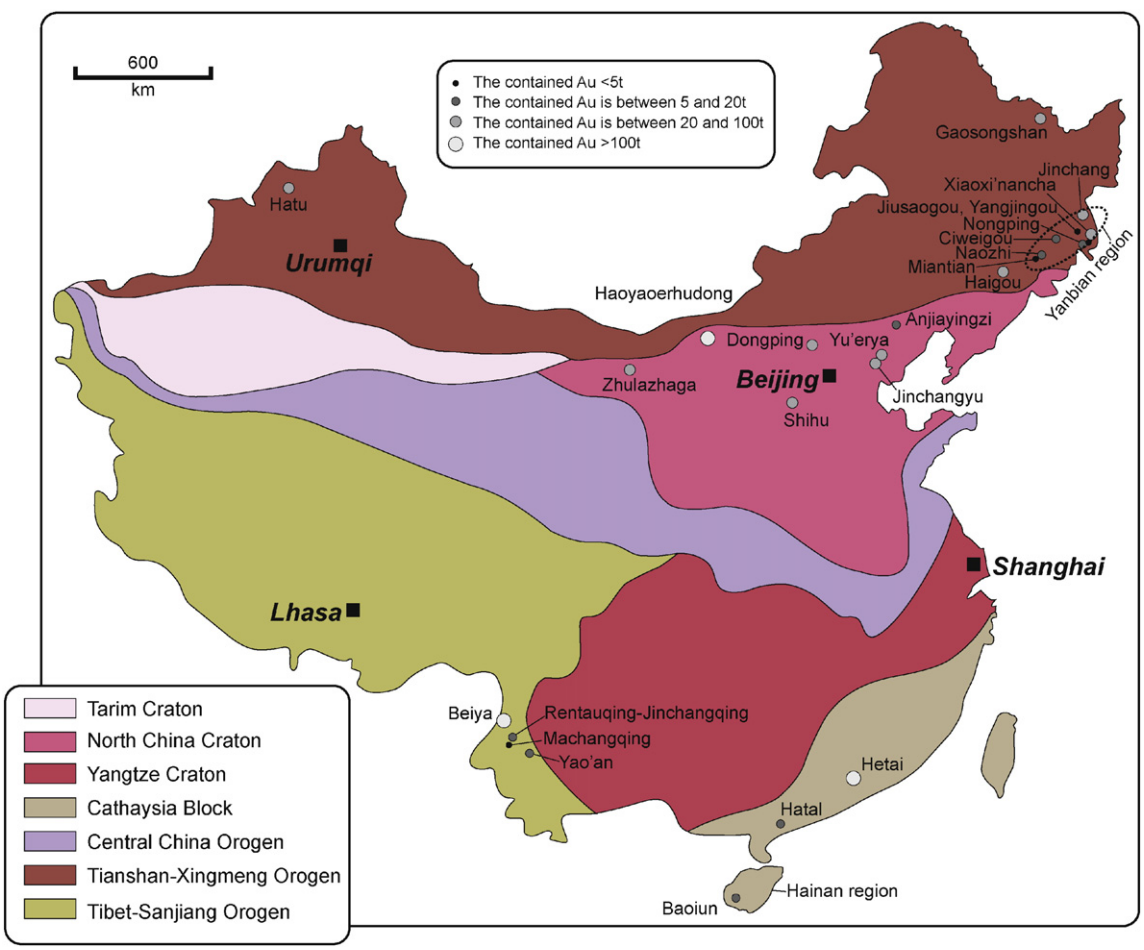

Fig. 2. Simplified geological map of China showing the location and contained gold reserves of the deposits reviewed in this volume. Modified after Ouyang et al., 2013.

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