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## The Great Mineral Fields of Africa

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The mineral wealth and potential of the African continent has been recognised for centuries. Various minerals have been exploited from different parts of the continent for many millennia, including gold, copper and iron. In addition, a number of other minerals were exploited in pre-historic times from various parts of the continent, including lead, zinc and tin.

New deposits and occurrences, as well as extensions to existing deposits are still being discovered to this day. Many exploration and mining opportunities still exist.

This paper is a summary of one of several papers included in the Special Issue of Episodes prepared for the 35<sup>th</sup> IGC, covering the Great Mineral Fields of Africa. It provides a brief overview of gold, platinum group elements, diamonds, iron ore, manganese, nickel, base metals, uranium, tin, rare earth elements, coal, oil and gas, phosphate and potash and heavy minerals in Africa, within the broader geological framework (Frost-Killian et al. [1]).

Africa has a long and complex geological history spanning approximately 3.8 billion years. Geologically, the African continent today broadly comprises Archaean nuclei, cratons, shields, mobile belts and platform areas. The type and distribution of the various mineral provinces, deposits and occurrences is directly related to the geological and tectonic framework of the continent.

The Archaean nuclei host a variety of world class mineral deposits of various ages, of which gold, platinum, diamonds, iron ore, and manganese are some of the most important. The Archaean nuclei are surrounded by younger metamorphic and/or orogenic belts, varying in size, geology, degree and nature of tectonism and metamorphism, contained mineral deposits and age (Paleoproterozoic to Neoproterozoic), for example, the Central African Copperbelt of Zambia and the Democratic Republic of Congo. In West Africa, the Palaeoproterozoic volcano-sedimentary rocks of the Birimian Supergroup, and the overlying younger Tarkwaian Group conglomerates (mainly Ghana) host several important gold deposits (Robertson and Peters [2], Smith et al. [3]). Granitoid intrusions into the mobile belts have given rise to important tin, tungsten, tantalum and rare earth element deposits across the continent.

Sedimentary basins, varying considerably in size and age (Archaean to Holocene) occur throughout the continent and overlie parts of the cratons and mobile belts. They are host to a variety of deposits including coal, oil and gas, alluvial and marine diamonds, manganese and iron, heavy mineral sands, and uranium, amongst others.

Achaean to Holocene-age predominantly mafic, magmatic intrusions of varying morphologies occur, including the significant layered intrusions of the Bushveld Igneous Complex and Great Dyke (platinum, chrome ±vanadium and titanium). Further mineralisation includes diamonds (kimberlites), rare earth elements, phosphate and copper (alkaline intrusives), as well as tin, tantalum, niobium, tungsten, rare earth elements, beryllium and fluorite.

*References:*

- [1] Frost-Killian S, Master S, Viljoen R, and Wilson MGC. (2016) Episodes *in press*
- [2] Robertson M and Peters L (2016) Episodes *in press*
- [3] Smith et al. (2016) Episodes *in press*

