DETAILS OF Nov. 23rd TALK – Dave Thomas (Cameco)
Artful Dodger @ 11:45 am

ABSTRACT – "What Does an Athabasca Basin Uranium Deposit Footprint Look Like? - Empirical characteristics and the relevance to exploration"

The Athabasca Basin is truly a 'one-of-kind' world class uranium district in terms of global uranium endowment and the extremely high grade nature of its deposits. Exploration over the past 50 years has identified an estimated 2.6 B lb U3O8 contained in some 54 deposit systems around the basin. Mining operations between 1974 and 2015 has produced 839.3 M lb U3O8 from 23 deposits. The 2015 uranium production in the basin of 34.6 lb U3O8 have nd came from three operations; the McArthur River, Cigar Lake and Eagle Point mines. This accounted for 22% of the world uranium production in 2015.

Uranium deposits in the Athabasca Basin belong to an empirical model class termed as Proterozoic unconformity uranium deposits by the International Atomic Energy Agency. The deposits are situated immediately below, above, or spanning an unconformable contact that separates relatively undeformed red-bed sedimentary rocks of Proterozoic age from underlying Archean to Paleoproterozoic crystalline metamorphic basement. A number of genetic models explaining how these deposits formed have been proposed over the last 40 years and many of the debates around various aspects of these process-focused models continue today.

Although genetic models are important in the understanding of metallogenic process, most of the tactical decisions that exploration companies and their geologists make in the search for the next big discovery are based on their understanding of the empirical geological models relevant to the commodity of interest. Over time, recurring empirical associations with mineralization or deposits are recognized and eventually become accepted facts of the 'model'. More importantly, these accepted facts of the empirical model are often used as measuring gauges at various stage gate decision points of exploration programs.

A compilation of various parameters characterizing the mineralization footprints of 54 uranium deposits systems from the basin was undertaken in order to quantitatively define what an Athabasca Basin uranium deposit footprint looks like and the range of variations that exist. This talk will review some of the assumptions long held by exploration geologists and discriminate fact from myth with respect to the footprint of a typical Athabasca Basin unconformity uranium deposit. The talk will conclude by presenting a provisional footprint-based classification scheme for Athabasca Basin uranium deposits.

Bio -

David Thomas is Director of Geoscience at Cameco Corporation and has been working in the uranium industry for the past 20 years. Previous roles in Cameco included business development and generative work as Director of Exploration New Business and Chief Geologist with Cameco's Exploration Technical Services group. Previous to Cameco, he was with the Saskatchewan Geological Survey for 14 years where he undertook mineral deposit studies in gold, base metal and uranium districts.

DETAILS OF Dec. 1st TALK – Jeremy Richards (University of Alberta)
SEG Thayer Lindsley Lecturer; Artful Dodger @ 11:45 am

ABSTRACT – "Tectonomagmatic controls on arc metallogeny"

The fundamental control of plate tectonic processes on ore formation was realized almost as soon as the plate tectonic model was established in the late 1960s-early 1970s. The formation of seafloor massive sulfide deposits at oceanic spreading centers, various types of sediment-hosted deposits in continental rifts, porphyry and epithermal deposits in volcanic arcs above subduction zones, and granite-related ore deposits in continental collision settings were quickly established. More recently, the formation of porphyry, epithermal, and some types of IOCG deposits has been recognized to occur by remobilization of lithosphere previously affected by prior episodes of subduction (or other types of mantle) metasomatism.

At root, these ore deposit types reflect the focused convection of heat and volatiles from the mantle towards the surface. Plate boundaries provide high-permeability pathways for this heat and mass flux, which is transmitted to the surface either directly as magmas or fluids (or both). At convergent margins, the flux begins with dehydration (and in some cases melting) of subducting oceanic lithosphere, which releases water, S, Cl, and other fluid-soluble components into the mantle wedge, triggering partial melting. Ascent of these partial melts into, and interaction with, the upper plate lithosphere generates hydrous intermediate-composition magmas, which rise into the upper crust where volatiles are exsolved due to decompression and crystallization. These hydrothermal fluids may go on to form porphyry and epithermal deposits if their flow is focused and sustained by a large magma supply.

Bio -

Jeremy first became interested in economic geology at an early age while on walks across the Yorkshire Pennines with his grandmother, where the dumps from numerous small historical lead mines yielded fine samples of galena and other minerals for his nascent rock collection. After studying geology at the University of Cambridge (1980–1983), he travelled to Canada to complete his MSc on Keweenawan Cu deposits at the University of Toronto with Ed Spooner (1986), and then to Australia for his PhD on the Porgera gold deposit with Ian Campbell at the Australian National University (1990). Following a post-doctoral fellowship at the University of Saskatchewan in Canada with Rob Kerrich, he returned to the UK to take up a lectureship at the University of Leicester. In 1997, he returned once again to Canada for a position at the University of Alberta, where he resides today. His current research interests focus on regional tectonomagmatic controls on ore-formation, and in particular subduction- and collision-related systems. This work has taken him to North and South America, the Middle East, Asia, and the southwest Pacific. A second research interest is in the role of mining in sustainable development, a field in which he has graduated one PhD and three Master's students. Jeremy has been a member of SEG since 1983, and a Fellow since 1985; he served on SEG Council and several committees between 2003–2006, and has been an Associate Editor for Economic Geology from 1997–2001, and 2012 to the present. He co-edited two volumes in the Reviews in Economic Geology Series (volumes 10 and 14), and the Economic Geology 100th Anniversary Volume. He is currently chief editor of an SEG Special Publication, which will be based on talks given at the SEG meeting in Çeşme, Turkey, in September 2016.