BOOK REVIEW


Western Australian state that extends for 2,645,615 km$^2$ constitutes one third of Australia, with a population of only 2,451,400; that too, 92% of the population is concentrated in the south-east corner of the state, i.e., in and around Perth. Having a density of population of just 0.94 km$^{-2}$, one can imagine how much of area would have been accessed by man. Even with such a thin population density in not so a friendly climatic zone, many mineral deposits have been recorded and exploited in Western Australia. In such a terrane, especially, exploring gemstones that have meagre occurrence is a great challenge. Here comes the importance of a special class of prospectors known as ‘fossickers’ in discovering several deposits.

Altogether the book comprises forty chapters distributed in seven sections. After a meticulous list of contents lies a brief abstract. As rightly mentioned in the abstract, the discovery of diamonds in the Kimberley region, has masked a plethora of other gemstones, decorative stones and ornamental stones occurring in the Western Australia, which the book aims to describe in detail. The book also includes an account of precious metals and pearls. Vast majority of gemstones and precious metals of Western Australia is distributed in the three cratons; namely Yilgarn craton in the south, Pilbara craton in the west-central part and western part of North Australian craton in the north.

Initial four chapters provide an account of the object and scope of the book, advances in gemmology and lapidary technology in Australia, historical aspects and prospecting for gemstones, mining act and other legislation in Western Australia (visit www.dmp.wa.gov.au for details). As pointed out in the beginning of this review article, in the sparsely populated arduous terrane, Australia is endowed with an unusual category of prospectors called ‘fossickers’. ‘Fossick’ means to search for and remove rock, ore or minerals (excluding gold or diamond) not exceeding 20 kg for a mineral collection, lapidary work or hobby interest by use of hand tools only…” (p11). The equivalent term of fossicking used in searching for opal is noodling.

First descriptive part Section 1; that includes Chapter 5 is devoted for diamond. It gives an account of occurrences of lamproites in Argyle located in the East Kimberley Diamond Province, Ellendale in the West Kimberley Diamond Province and between Berkley and Drysdale rivers in the North Kimberley Diamond Province. Apart from Kimberley Province in the northern part of Western Australia, diamond also occurs in the kimberlite-like diatremes of Wandaegee Diamond Province in Carnarvon basin and in the East and West Pilbara craton. Even though the first record of discovery of diamond in Western Australia goes far back to 1895, serious efforts for exploration commenced only in 1965. The description of the geology and occurrence are brief, crisp and lucid. Argyle mines are well-known for producing exceptionally gorgeous ‘fancy’ pink diamonds. It is appropriate to add at this point that the diamond-cutters of Gujrat are very familiar with the polysynthetically twinned ‘tough’ diamonds from Australia, and for cutting these diamonds they demand higher wages!

Section 2 is devoted to gemstones associated with pegmatites. Beryl group is dealt in Chapter 6. Different types of gem-beryls; emerald, aquamarine, heliodor, morganite and goshenite are found in Western Australia. Emerald deposit is found in Poona in the northern part of Yilgarn craton. The quality and quantity of Australian emerald and other beryls, however, do not appear to have left much impact on the world market. Tourmaline group is dealt in Chapter 7. Beautiful concentrically zoned partly-coloured watermelon as well as blue-green elbaite tourmaline specimens are found in Spargoville, Kambalda region. Chapter 8 is devoted specially to tourmaline-rich rock, tourmalite. A lapidary-grade massive, black and opaque tourmaline rock was discovered in an island within the Lake Mongers in an area known as Warriedar. It was confirmed as Mg-Fe-rich cryptocrystalline tourmaline, belonging to dravite-schorl series and was named after the locality as warrierite. The specimens take excellent polish and form elegant carving material. The feldspar gems varieties, amazonite and moonstones; as well as graphic granite occurring the region is described in Chapter 9. As presented in Chapter 10, topaz is one more pegmatite gem-mineral that occurs in small quantities in the region. Minor pegmatite gemstones are described in Chapter 11, of which attractive, purple to violet-blue coloured lepidolite-rich rock taken out from Lepidolite Hill pegmatite, near Coolgardie and Carlaminda Blue pegmatite in Noongal area are worth mentioning. Gem quality colourless to pink petalite and decorative pink spodumene and phenakite (also spelt phenacite) are some more stones found to occur in small quantities.

Siliceous gemstones are described in Section 3. Different varieties of gem-quality quartz; i.e. rock crystal and its coloured varieties amethyst, heliodor, rose quartz and smokey quartz is included in Chapter 12. Most coveted stone of Australia happens to be opal. Although the states of South Australia and Queensland are better known for opal, some fine specimens are also mined from Cowarna Downs of Yilgarn craton (Chapter 13). Fire opal, siliophite (chatoyant opal variety, formed by replacing chrysotile), moss opal, chromium bearing green variety and variably coloured common opal are mined at different places. Chalcedony groups are accounted in Chapter 14. They occur mainly in the amygdalae and fracture filling in basalts, rhyolites and other rocks. Greyish variety, attractively designed orange-red (coloured due to traces of iron oxides) variety with fancy names such as crazy-lace agate,
Section 4 provides information on organic gems. Chapter 16 is committed to pearls, *periculter* (the process of pearl culturing) and shells. Details of occurrence of natural as well as cultured marine and freshwater, nucleated and non-nucleated pearls, mother-of-pearl, various types of shells and *opercula* (purplish iridescent doors of certain marine snail shells; *operculum-singular*) are discussed.

Australia is well known for the production of gold, of which the major contribution is from Western Australia. Australian gold *rush*, occurrence of gold in Kalgoorlie, Coolgardie, Southern Cross, Cue and Norseman, and occurrence of silver are explained with geological map in Chapter 17 of Section 5.

‘Other Gemstones’ are described in Chapters 18 to 29 of Section 6, which are either occurring in meagre amount or of minor commercial importance. These are; andalusite and chiastolite (Ch 18), chrysoberyl-alexandrite (Ch 19), corundum varieties (Ch 20), copper-bearing calcite (icelandspar) – turquoise, malachite-azurite-chrysocolla (Ch 21), diopside (Ch 22), fluorite (Ch 23), garnet group (Ch 24), gaspeite (Ch 25), iron-rich gemstones (Ch26), prehnite (Ch 27), rhodonite (Ch 28) and variscite (Ch 29). The most important group of gemstone, corundum even though recorded in numerous places, surprisingly is of poor quality. Considering the abundance of patches of mafic-ultramafic rocks occurring within granite-gneisses intruded by pegmatites, significant amount of desilication and formation of large amount of aluminium-rich gemstones, particularly chromium-rich rubies are expected. Fine quality turquoise, gaspeite, hematite, tiger eye and tiger-iron (microcrystalline hematite and cherty quartz with lenses of golden-brown tiger eye) are recorded in the region. Spectacular chromium-vanadium-bearing green specimens of variscite of the region are worth mentioning.

The final part of the book, Section 7 deals with decorative stones, are elucidated in Chapters 30 to 40. Carbonate group is described in the Chapter 30. To start with, (doubly refracting) stones, are elucidated in Chapters 30 to 40. Carbonate group (Ch 24), gaspeite (Ch 25), iron-rich gemstones (Ch26), prehnite (Ch 27), rhodonite (Ch 28) and variscite (Ch 29). The most important group of gemstone, corundum even though recorded in numerous places, surprisingly is of poor quality. Considering the abundance of patches of mafic-ultramafic rocks occurring within granite-gneisses intruded by pegmatites, significant amount of desilication and formation of large amount of aluminium-rich gemstones, particularly chromium-rich rubies are expected. Fine quality turquoise, gaspeite, hematite, tiger eye and tiger-iron (microcrystalline hematite and cherty quartz with lenses of golden-brown tiger eye) are recorded in the region. Spectacular chromium-vanadium-bearing green specimens of variscite of the region are worth mentioning.

The authors deserve to be congratulated for presenting a beautifully illustrated book with ample information on a variety of gemstones of Western Australia. Considering the geological setting of the region, there appears to be many more fascinating gemstone deposits yet to be discovered. Given a greater incentive, the fossickers could assist in finding more deposits.

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