Potential and Outlook

Although New South Wales does not appear to have significant potential for large jade deposits of commercial value, small deposits may be associated with serpentinite belts, particularly the Great Serpentine Belt, in the northeast of the state (Figure 6).

The size of known jade deposits in New South Wales is very small compared with the high-grade deposits at Cowell in South Australia, which dominate world production.

Nature and Occurrence

Jade consists of two distinct minerals, nephrite and jadeite — \( \text{Ca}_2\text{(Mg,Fe)}_5\text{(OH)}_2[\text{Si}_8\text{O}_{22}] \) and \( \text{Na}_2\text{(Al,Fe)}_2[\text{Si}_4\text{O}_{12}] \) respectively. Nephrite is a member of the tremolite–actinolite series of the amphibole group. Jadeite is a clinopyroxene (MacNevin & Holmes 1980).

Nephrite (also known as greenstone) is the toughest natural jade mineral owing to the development of an interlocking felted mass of fibrous monoclinic crystals (Webster 1976). Jadeite is an aggregate of inter-locking monoclinic crystals which are more granular than fibrous.

Most known deposits occur as lens-shaped bodies at or near the faulted margins (commonly sheared) of hydrothermally altered serpentinites. Examples of this type of deposit are found in New Zealand, Canada, Taiwan, Guyana, Surinam, southern Europe, Russia and China.

The Cowell deposits in South Australia occur as elongate lenses within metamorphosed dolomitic marble and banded calcsilicate rocks of Early to Middle Proterozoic age that have undergone retrograde alteration during deformation (Flint & Dubowsk 1990).

Applications

Nephrite is used extensively for carving and ornamental stone. Top-quality jade can be carved with diamond-tipped tools, and polished with diamond pastes (thus achieving the characteristic final lustre). There are no rigidly enforced specifications for jade. Variations in colour and other physical properties allow jade to be used for a variety of end-products, including ornamental stone carvings (such as urns, vases and statues), and as personal jewellery.
Economic Factors
Presently identified nephrite jade resources, particularly in South Australia, are sufficient to meet world demand for the foreseeable future (Flint & Dubowski 1990).

References

