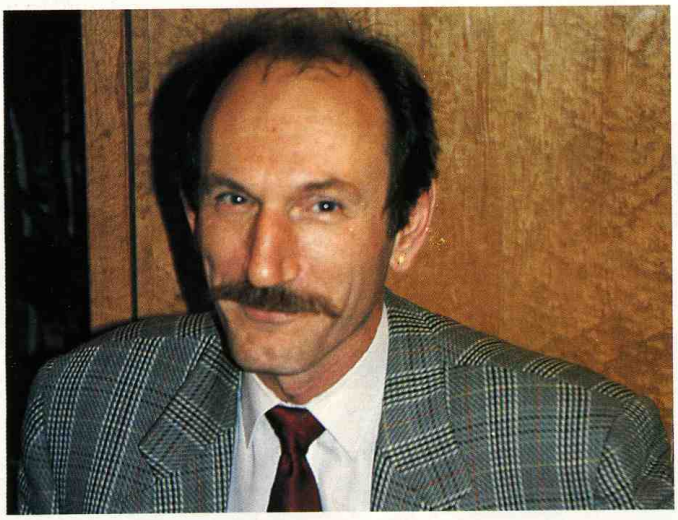
The case for blue-green emerald

Methods to distinguish between emeralds and green beryl were discussed at the International Colored Gemstone Association's congress in Hawaii in June 1991. In this viewpoint, director of the Swiss Foundation for the Research of Gemstones in Zurich, Switzerland, Dr Henry Hanni, discusses another issue of nomenclature, blue-green emeralds



Emerald is a green variety of beryl which owes its colour to chromium and sometimes vanadium. This is an historically used formula, accepted by the Confederation of Jewelry, Silverware, Diamonds, Pearls and Stones, or CIBJO.

It does not matter how green the emerald is, as long as it is perceived as green, light green, medium strong green, or strong green. There are no master stones which draw a line between green and light green emerald.

Parallel to the development with ruby and pink ruby, formerly pink sapphire, I do not feel that an emerald, or ruby, must possess a certain saturation of green, or red, to earn its name. It is not a concept of nature to distinguish between light and darker green emerald, or light and darker red ruby.

Green beryl is a variety of beryl whose colour is due to iron. It is a mixed colour: yellow, golden beryl, with trivalent iron; and blue, aquamarine, with bivalent iron.

A green beryl possesses both causes of colour and shows the mixed colour of yellow and blue, which is green. An excess of blue gives green-blue, and an excess of yellow gives greenish-yellow.

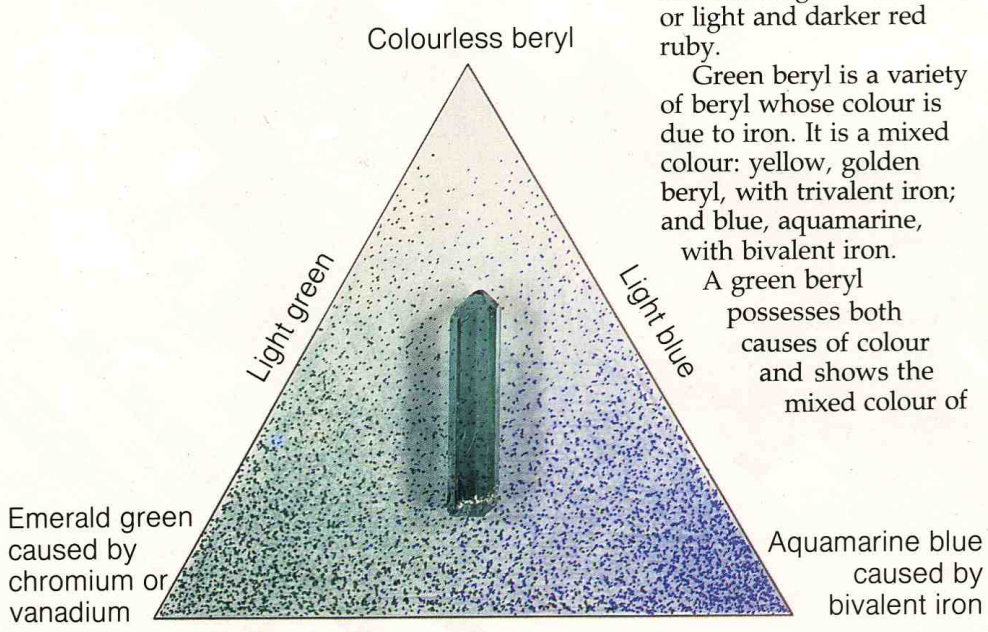
Blue-green beryl was discovered in Zambia in 1983 and was accepted as emerald, although the stones have a considerable amount of bivalent iron which gives them a bluish colour. They could be described as mixtures of emerald with aquamarine and have mixed colour.

The balance between green from chromium and blue from bivalent iron seems to be on the green side, but a bluish tinge is visible in Zambian emerald.

Tests show that emerald from a recently discovered deposit in Nigeria has a similar composition to Zambian emerald, although green and blue are more evenly balanced and the colourless component is stronger, leading to lighter saturations.

Colour can be best understood in a colour triangle: with emerald green, caused by chromium or vanadium; aquamarine blue, caused by bivalent iron; and colourless beryl representing the corners (see diagram). Light green or light blue is on the edge between the green or blue corner and the colourless pole. Mixed colours are within the triangle, depending on the relative amounts. Medium to light blue-green emerald may be placed in the centre of the triangle, such as blue-green emerald from Nigeria.

continued on page 90



Colour triangle for blue-green emerald from Nigeria

Chatham in Japan

A co-operation agreement was signed between two synthetic gemstone producers, Chatham Incorporated in the United States and Earth Chemicals Ltd in Japan, in May 1991.

President of Chatham Incorporated, Tom Chatham, said co-operation will mean larger production of Chatham synthetic emerald and increased sales of Chatham synthetic gemstones in Japan.

Chatham becomes distributor of Gilson synthetic emerald in the United States and Canada. Earth Chemicals purchased production rights and facilities for synthetic emerald, opal, turquoise and coral from Gilson SA in Geneva in 1980.

Chatham's production company, Chatham Crystals Research and Development Co in San Francisco, will oversee production of Chatham synthetic emeralds at Earth Chemicals' factories in Kobe and Osaka.

Earth Chemicals has companies in chemicals, watch crystals, wine and soft drinks.

Stronger USSR-Israel contacts

Contacts between the gemstone industries in Israel and the Soviet Union have been strengthened following exchange visits by groups from the two countries, Pini Pinchasi said in a review of activities after his re-election as president of the Israel Precious Stones and Diamonds Exchange in Ramat Gan.

Blue-green emerald

from page 88

The presence of iron and a little chromium and vanadium in the blue-green crystals from Nigeria have been proved by energy-dispersive spectroscopy and X-ray fluorescence analysis techniques. The chromium allows us to call the stone emerald. There is not as much chromium as is usually seen in a Zambian emerald, but enough is present to cause a green shade besides blue. The aquamarine does not completely mask the emerald.

A proposal has been made to measure the chromium content and decide a lower limit for emerald. This is not convenient:

- First, because the analytical instrument required, the electron microprobe, is large and expensive.
- Second, it does not consider the size and cut of the stone, which are both important for the path of light and the strength of absorption, or intensity of colour.
- Third, a lower limit value for chromium in emeralds does not exclude the possibility that the chromium green is covered by another colour whose colouring element is more dominant.

The nomenclature rules, scientific considerations and practical possibilities allow and recommend the name blue-green emerald for beryl which has green as the visible part of the blue-green mixed colour. A colour description, blue-green, will indicate that the emerald in consideration is different from a normal green emerald.