Multi-Phase Inclusions

Internal cavities, whether filled by liquid or gas, are also classified as inclusions. The liquid can be plain water or a chemical solution, while the gases are frequently air or carbon dioxide. When a pocket contains both gas and liquid, it is termed a *two-phase* inclusion. Occasionally, solid matter, such as recrystallized mineral, is also present. This produces a *three-phase* inclusion. Quartz, calcite, and amber are the most common hosts of such interlopers. As with organic material in amber, two and three-phase inclusions can provide valuable clues to the atmospheric and geological conditions prevailing at the time the gem formed. And, as with amber, collectors prize fine examples of such inclusions.

Euphemisms

The gem world has a rich tradition of sales-oriented language, and nowhere is this more true than in the often-shady world of marketing included stones. Cracks and internal fractures are given the harmless sounding name "feathers." When such lovely feathers occur in a still-forming gem, pressure, influx of fluid, or heat can cause partial healing, resulting in a "fingerprint," a dainty name for a very distracting patch of arcs and tiny cavities. Perhaps the most egregious example of gemological euphemism occurs in the high-stakes world of emerald marketing. This variety of beryl, while greatly valued for its rich green colour, is particularly prone to severe internal fracturing and inclusions. Dealers have adopted a variety of techniques to repair, or more often conceal, such flaws (see Chapter 13.2), and they have been equally creative in their verbal blandishments. The term *jardin*, literally "garden" in French, has become common usage to describe inclusions in emerald. Doesn't that sound nice?

12.12.2 Dealing with Inclusions

Whether you love inclusions or hate them, you are going to have to deal with them. The most obvious strategy for managing a bad inclusion in a piece of gem rough is to put the stone back down on the dealer's table. If that is not possible, either because you missed the opportunity to do so or the gem is otherwise too appealing, you will have to manage the situation at the orientation and cutting phases.

Chapter 6.7 explains strategies for orienting gem rough. In the case of inclusions, the basic idea is to place them in a location that will be cut away. Again, this may not be possible, in which case you should try to locate any uglies somewhere discreet, such as near the girdle. Another option is to hide them in the overall scintillation of the gem, for example, under the crown star facets. Whatever you do, you should avoid an orientation which places inclusions near the culet, since your one small flaw could be optically multiplied four, or eight, or sixteen times (see page 209 of Volume 1).

Inclusions present a further challenge to the finicky faceter. If a flaw breaks through the surface during fine cutting or polish, havoc will almost certainly ensue (see page 339 of Volume 1). There is nothing quite like the feeling of seeing an almost complete, almost perfect facet that has just been ravaged by the breakout of a nasty inclusion. Such breakouts inevitably force you to polish further, which can open up the flaw even more. This cycle of destruction sometimes continues to the point where it is easier and less stressful to recut the entire pavilion or crown. Short version: don't let inclusions anywhere near the surface of your gemstone.

Let me end this too long yet too short discussion of inclusions with a quote from Gerolamo Cardano, the great sixteenth century Italian mathematician, doctor, astrologer, and gambler.

(Given this range of pursuits, you will be unsurprised to learn that Cardano was a real character. Famously arrogant, he supported himself by gambling, since the local universities refused to hire him. In doing so, he helped lay down the foundations of the modern disciplines of probability and statistics. He also landed in hot water by casting the horoscope of Jesus Christ, an apparent publicity stunt viewed dimly by the religious authorities of the day).

Here is what Cardano had to say about inclusions:

"In precious stones, imperfections are in reality less common than in animals and vegetables; but they are more conspicuous in jewels, simply because their nature is more brilliant and more rare. For the same reason, great men appear to have more vices than common mortals; but this is a delusion and an error. The lustre of their fame and the splendour of their names render their faults only the more apparent; while the ignorant vulgar, under favour of their obscurity, escape having their vices noticed."

Figure 12-44 Gerolamo Cardano, one of the founders of the field of probability and statistics, thanks to some unhealthy habits.

Cardano's quote sums up the world of inclusions pretty well for me. His opinion? Sure, inclusions are bad, just like the character flaws of the great and presumably good, but they only look bad because their hosts are so fine. Sales talk. I suggest that we refer to the next embarrassing public peccadillo of a distinguished national leader as "jardin."

Excluding Inclusions – The 1 carat boundary

Deciding whether and how to exclude an inclusion is always tough. It is tough because this choice often involves reducing the ultimate size of the final gemstone. Of course, if careful orientation can send the flaw down the drain of your splash pan, fine. It's the rest of the time – the time governed by Murphy's Law – that you have to make a difficult decision.

Let me try to convince you that you should face this choice objectively, and in particular, with no direct concern about the final, exact carat weight of the gem. This is a somewhat forlorn hope on my part, because like everyone else, I have a psychological barrier to overcome: somehow, a 1.0 carat gem seems much more valuable than a 0.95 carat gem. This desire to get above a certain target weight might encourage you to make some non-optimal design and cutting choices.

A strong focus on the exact final yield will result in less than ideal outcomes. Perhaps Vargas said it best: "There can be little argument against a smaller perfect gem versus a large incorrectly cut one," (*Faceting for Amateurs*, 3rd edition, page 157) In fact, jewelry experts advise buyers to avoid 1.0-carat diamonds. A 0.9-carat gem will be virtually indistinguishable and will come at a substantially better per-carat price. As a direct corollary, a 1.1-carat stone will very likely be better cut.