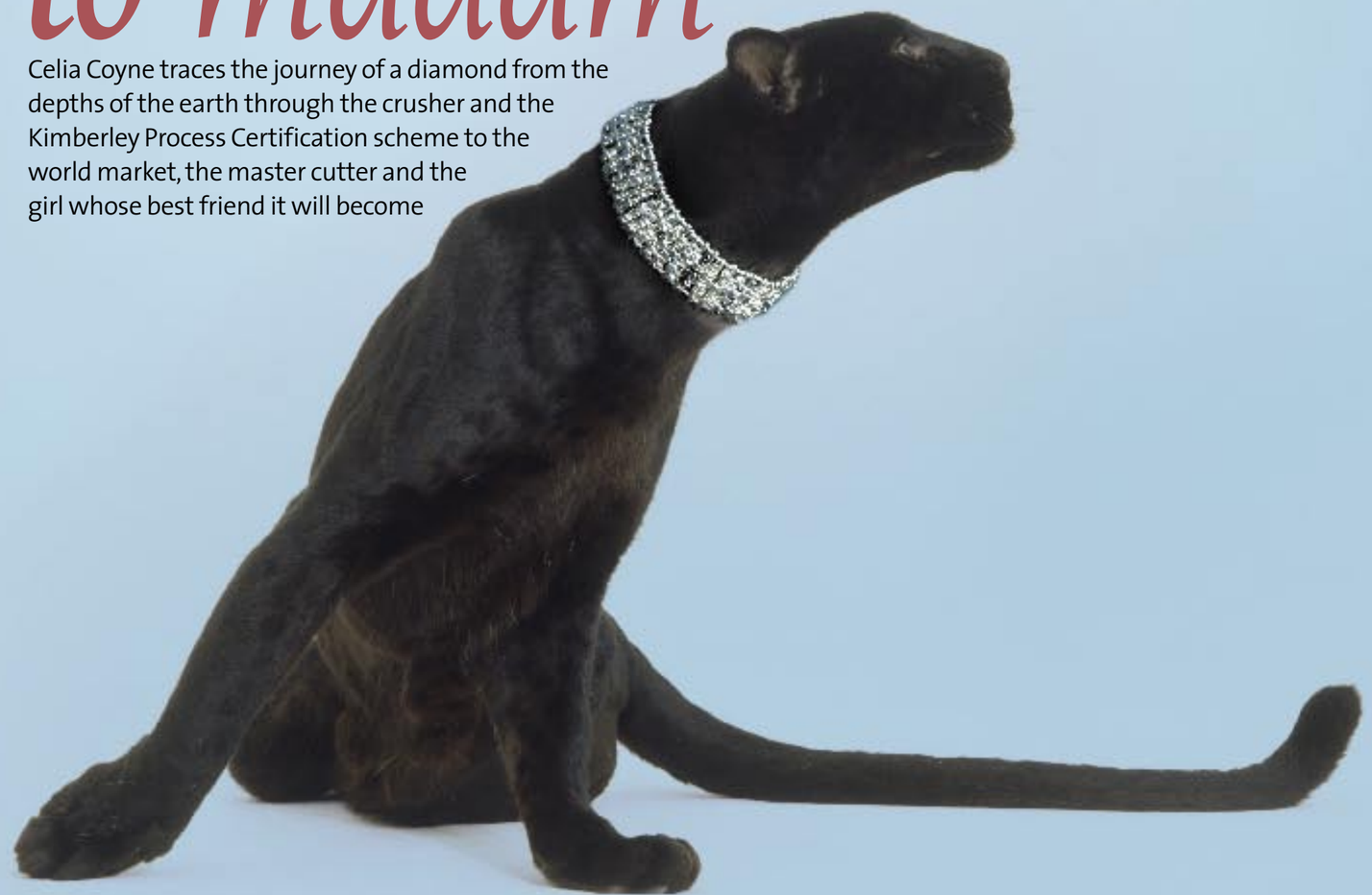
From mine to madam

Celia Coyne traces the journey of a diamond from the depths of the earth through the crusher and the Kimberley Process Certification scheme to the world market, the master cutter and the girl whose best friend it will become



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OUR LOVE affair with diamonds is as enduring as the stones themselves. All over the world diamonds demand high prices and yet their value is entirely conceptual – born of the desire to own something rare and beautiful. Though cloudy industrial diamonds are used for cutting and polishing, their sparkling cousins with fancy facets serve no practical purpose at all. They exist simply to be adored.

All diamonds have travelled a long, long way. From the proud solitaire of an engagement ring to the twinkling chips around a watch face, each stone's journey begins in the same place: billions of years ago in the very depths of the earth. This is where temperatures and pressures were high enough to squeeze carbon atoms into a rigid crystalline lattice that is the hardest natural substance on Earth.

Finding the gems today relies on locating the source rock, known as kimberlite. "Diamonds are formed in kimberlites, which are nothing more or less than old volcanoes," says Roy Spencer who has been prospecting for diamonds for more than 40 years and is a director of European Diamonds. "Kimberlite has come from very deep parts of the earth called the mantle, about 200km below the surface." Deep eruptions have brought the molten diamond-bearing rock towards the surface, where it has cooled and solidified into huge, carrot-shaped formations called "pipes". Pinpointing the pipes' exact location requires a fair bit of legwork. It is a practice that has changed little over the years.

"It is still about going out and looking," says Roy. "It is like being a detective, you wander along rivers and streams taking samples of kimberlite indicator minerals." The minerals, such as red and purple pyrope garnet and bright-green chrome diopside, have been weathered out of the kimberlite and have ended up downstream of the source rock. But even when the field geologists find the elusive kimberlite, there are no guarantees of diamonds. "Less than one per cent of these kimberlite volcanoes contain diamonds. Of that one per cent there's probably one to five- per cent that are economic. So it's a pretty long shot," says Roy.

When a promising lead has been found, airborne surveys pinpoint the location by studying magnetic variations in the rocks and changes in the gravity field. "At the end of the day you need someone to go back on the ground and check it with a mobile drill rig," says Roy.

Any way you look at it exploration is costly, especially since diamond-bearing rock just happens to be in some of the most remote and inhospitable regions of the world. But with a global market for rough stones worth over US$12 billion a year, there is plenty of incentive to find them. De Beers allocates an annual budget of $100 million for exploration.

"Diamonds are the ultimate non-renewable resource," says Roy. "What the industry is facing right now is a situation where there are no new diamond mines on the horizon and the existing mines are facing ever-decreasing production as the mines get older. The only country where production is still robustly going along is Botswana."

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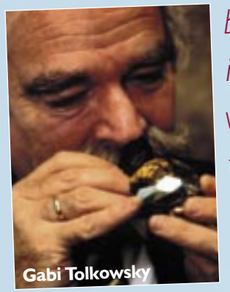
But Roy personally is not unduly worried, because he has found himself a potentially lucrative prospect in Europe. "We have a fairly aggressive exploration programme in Finland where we've actually found kimberlites and found diamonds in them," he says. The plan is to open Europe's first diamond mine there in a few years' time.

Meanwhile Roy's company is mining diamonds in Lesotho in southern Africa. "We are producing a quarter of a million carats of diamond a year. That will increase to something close to one million carats per year by 2010," says Roy. Lesotho is known for its large diamonds and hopes are high that a big one will one day emerge on the sorting tables. "Our mine has produced a 60-carat diamond and we have strong evidence of a stone of about 140 carats, which was broken at the end of last year." The breakage resulted from the mechanised sorting process that all hard rock diamonds go through. Once mined, the matrix rock is sent through a series of crushers with diminishing apertures. At each pass the diamonds are removed from the debris. But if an aperture is smaller than a diamond passing through it, disaster can strike. "We had set ►

ours for 100-carat stones," says Roy. "So this 140-carat diamond came along and it didn't take long for it to get shaved down. As we were sorting the stones on the conveyor belt, the fragments all came out together and so we knew. But all was not lost. The biggest piece was a 27.8-carat fragment, which we sold for $27,000 per carat, such was the quality. Heaven knows what the whole stone would have been like."

Besides the odd accidental crushing, diamond mining's major concern is security. "Human beings are wonderfully innovative," says Roy. "You can never say that you have covered all your bets. You do the best you can and we have state-of-the-art security, but folks still get away with pinching the odd stone. We had one case where a fellow on the night shift had smuggled a long pole into the mill and he had a rag dipped in grease at the end of this pole and was 'fishing for diamonds'. He got a couple. We watched him for a little while on the CCTV, before arresting him."


Gabi Tolkowsky

It is not just the petty thieves who are attracted to diamonds, but larger, more organised crime. Conflict diamonds have given the industry a bad name in the past, but with the Kimberley Process Certification Scheme in force since 2003, it is safe to say that over 99 per cent of diamonds now reaching the market are conflict-free. As a founding member of the World Diamond Council and secretary general of the International Diamond Manufacturers Association, Stéphane Fischler is committed to promoting the highest standards of honesty in the industry throughout the world. "All diamonds have to be certificated before leaving the country of origin," says Stéphane. One of the things the authorities check is that the diamonds are not mixed with others of a different origin. This is important as someone might try to slip in a conflict stone and bring it to market that way. "There is still a ban on Ivory Coast diamonds, for example," says Stéphane. "If people tried to mix Ivory Coast diamonds in with Sierra Leone stones, any expert would be able to see the difference. The colour, shape and fluorescence would be different. In that sense we are happy that the Kimberley Process is a success. But it is really the governments that got their act together and stopped the murdering."

Once experts have checked the weight and the price, they seal the goods and issue Kimberley certificates. "Most rough diamonds go to Antwerp. They enter the Diamond Office, a very secure area under control of customs officers and cameras. First they check the seal has not been tampered with; then they check the certificate is genuine. A confirmation of receipt goes back to the exporting authority."

Diamond dealing in the various bourses around the world is still carried out on a promise and a handshake, with the traditional Hebrew word *Mazal* (meaning "good luck") to seal the deal. It is an industry still run on trust – and today the process must remain as transparent as the stones themselves, with a chain of paperwork linking every stone to a strict system of warranty.

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Facets of beauty

Most rough diamonds are cut and polished in India and China, where labour costs are low. The larger and more difficult stones find their way to Israel, New York and Antwerp, where the more experienced diamond-cutters are based. Though there is now computer technology to assist in the process, nothing can replace the judgment of a cutter who knows his craft. Master diamond cutter Gabi Tolkowsky has worked on some of the largest and most dazzling diamonds in the world, including the 273.85 carat Centenary diamond – the largest modern, colourless, flawless diamond – and the Golden Jubilee, which at a whopping 545.67 carats takes the crown as the biggest faceted diamond ever.

For Gabi, the skill of a master cutter is not only to gain the biggest and most valuable stone for the client but to fulfil the stone's potential. He sees it as a duty to the stone itself. "Every diamond is unique," he says. "It's a personality. You talk to it; you ask it questions. You ask it what it would like to become. The answer is always the same: 'I would like to become the most beautiful.' To each one you promise that you will make it the most beautiful – yet every diamond has a unique beauty that is impossible to surpass."

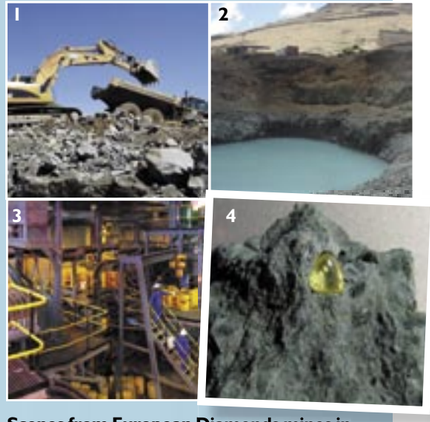
A sixth-generation cutter, Gabi started learning about diamonds before he could talk, when he would listen to the professional cutters, polishers and cleavers who came to his father's house. He has been cutting for 51 years, yet he never gets tired of his profession. A diamond cutter's job demands extraordinary skills: you have to be both mathematician and artist rolled into one. "You need a mixture of the love of art, love of dream, a perception of colour, light and symmetry, and an understanding of three-dimensional volume," says Gabi. "If you have all those things, in many years you could become a master cutter."

A lot of the work is done in the mind, deciding on the most suitable shape and how the light will best flow through the finished gem. "Some stones are straightforward, where the shape speaks for itself. But some are a headache. Your first perception may say it will be a round stone and then perhaps you think it could be a cushion, and then perhaps a square." The choice of cut is enormous and in his years as a cutter Gabi has counted some 380 different styles of facets on various shapes worldwide. When he reaches a point where he can't decide how to proceed, Gabi finds it is often a good idea to sleep on the problem. "You talk to the diamond in the daytime and it answers you during the night. You wake up in the morning and often you have the answer."

Over the years Gabi has seen some of the world's most sparkling jewels emerge before his eyes – every one unique. He insists that even after 51 years he is still an apprentice as each stone has something new to teach him. He remains enchanted by diamonds, his favourite design being the heart-shaped cut. "I gave a heart-shaped diamond to my wife when we were engaged – it was the first diamond I owned," he says.

Gabi is not alone in his emotional attachment to these most stunning of minerals. Stéphane Fischler sums it up: "Diamonds will remain an emotional commodity. The first thing is the emotion enjoying it. It is not the purpose of a diamond to be put in a vault. They have to be worn; they have to be seen; they have to be passed to another generation – that's the story of diamonds." ■

DE BEERS GROUP/GARRARD



Scenes from European Diamonds mines in the Kingdom of Lesotho: 1 mining the satellite pipe; 2 main pipe in its "K5" zone; 3 the Liqhobong plant; 4 Liqhobong kimberlite with fancy yellow diamond embedded (the diamond measures approximately 70mm across)

CURIOUS DIAMOND DATA

- US-based company LifeGem will take the ashes of a loved one and turn the carbon content into a synthetic diamond of up to one carat. Last September the company made three 0.56-carat fancy blue diamonds using a sample of Beethoven's hair.
- In 2004 astronomers discovered a diamond about the size of our moon in the Centaurus constellation. What may be the galaxy's largest diamond is the heart of a dead star, a crystallised white dwarf.
- Several diamonds are thought to be cursed, including the Black Orlov, which has been associated with suicides, and the blue Hope, said to have been worn by the doomed Marie Antoinette while other owners have also met with violent ends.
- Diamonds have been found in meteorites, some of which formed before our solar system existed.
- For two diamonds of top colour, quality and equal weight, one of them round cut, the round-cut diamond will always be the more expensive. This is because 50 per cent is lost in the cutting and polishing, whereas other cuts give greater yields. In effect, you are paying for what has been thrown away.