

 'Ivy League' platinum brooch, with hand-fabricated branches and bezels.

Photos courtesy Llyn L. Strelau

Platinum

Right or wrong?

By Llyn L. Strelau

Platinum has been known for centuries, but until recently, it was a mysterious novelty that frustrated the Spanish conquistadors who found it when panning for gold. They were baffled by the white metal bits mixed with gold nuggets that were difficult to separate and could not be melted. In Spanish, platinum was called 'platina,' the diminutive of the word for silver, 'plata.'

Platinum's use in fine jewellery only began in the 19th century, when technology was first developed to allow

jewellers and others to work it. In its pure state, this white metal is very soft, malleable, and ductile. Just as with gold and silver, pure platinum is too soft for most jewellery applications; however, by mixing it with other metals, the resultant alloy is hard enough to be functional.

Changing with the times

It wasn't until the Edwardian period that platinum became a popular metal for use in jewellery. This was fuelled by a change in the dictates of fashion,

bench tips



Art deco-inspired 'Fan Dance' pendant/clasp with matte-finish platinum set with tapered baguette suite of two rubellite tourmalines (2.20 ctw), 1.03-carat aquamarine, and tapered baguette diamond suspending a 15.4 x 13.8-mm South Sea pearl with rose and aqua overtones.

'Moonshine' features delicate platinum wires forming a web to support bezel-set gemstones.

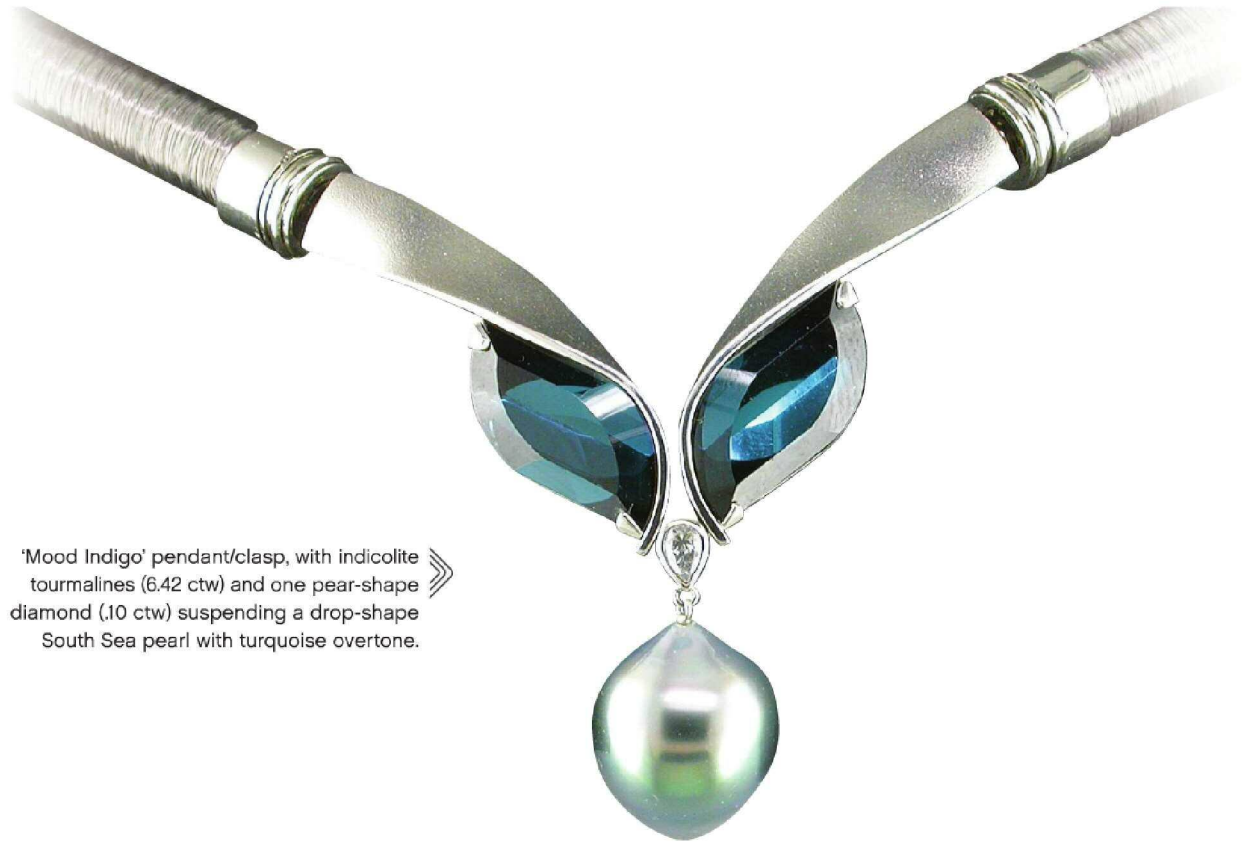


new supplies of diamonds and pearls, and improved technology to allow it to be worked. Prior to this, most jewellery was made with yellow gold or sterling silver (often backed by gold for strength when it was set with diamonds or gemstones). Most gems of the time were rose cut and these had to be set in closed, foil-backed settings. The silver and foil would eventually tarnish, which required the stones to be unset periodically so the foil backing could be replaced.

During the majority of Queen Victoria's long reign, her extended period of mourning for the loss of her husband, Albert, dictated that clothing should be very subdued and feature black or other dark colours—jewellery followed suit. Mostly yellow gold, pieces featured black stones, such as jet.

The Edwardian era changed all this. Ladies' fashions favoured pastel colours, blue, green, silver, and white, instead of Victoria's somber hues. Even during the final years of her reign, her son, Prince Edward and his wife, Alexandra, maintained a 'shadow' court where, in private situations, the strict colours of mourning were replaced by this more cheerful pastel colour palette. Once Edward took the throne, these soft colours became popular with everyone. Gemstones like pale amethyst, aquamarine, and natural pearls from the Persian Gulf replaced the darker hues of garnet and other deeper tones. These colours were far more attractive when set in white metal. Silver, the traditional choice, was not ideal, since it tarnished, making platinum the perfect solution.

During this period of Imperial expansion, significant deposits of fine diamonds were coming out of South Africa. The evolution of diamond cutting from old mine and European-cut diamonds, the precursors to today's ideal brilliant cuts, exploited their high index of refraction. The availability of platinum made it possible to create airy and delicate settings in a white metal that enhanced a diamond's brilliance.



'Mood Indigo' pendant/clasp, with indicolite tourmalines (6.42 ctw) and one pear-shape diamond (.10 ctw) suspending a drop-shape South Sea pearl with turquoise overtone.

Platinum is a perfect medium for setting diamonds. Combined with its very good tensile strength, its inherent malleability, and ductility, it was ideal for the elegant designs of the Edwardian period, which incorporated lace and filigree esthetics. To achieve this, jewellers would begin with a platinum plate, draw out the motif, and then using delicate saws, gravers, and millgrain wheels, create the most beautiful and elegant open work. Platinum made it possible to set diamonds and other gems with the least possible amount of visible metal, while still providing enough structural stability to create durable and functional jewels.

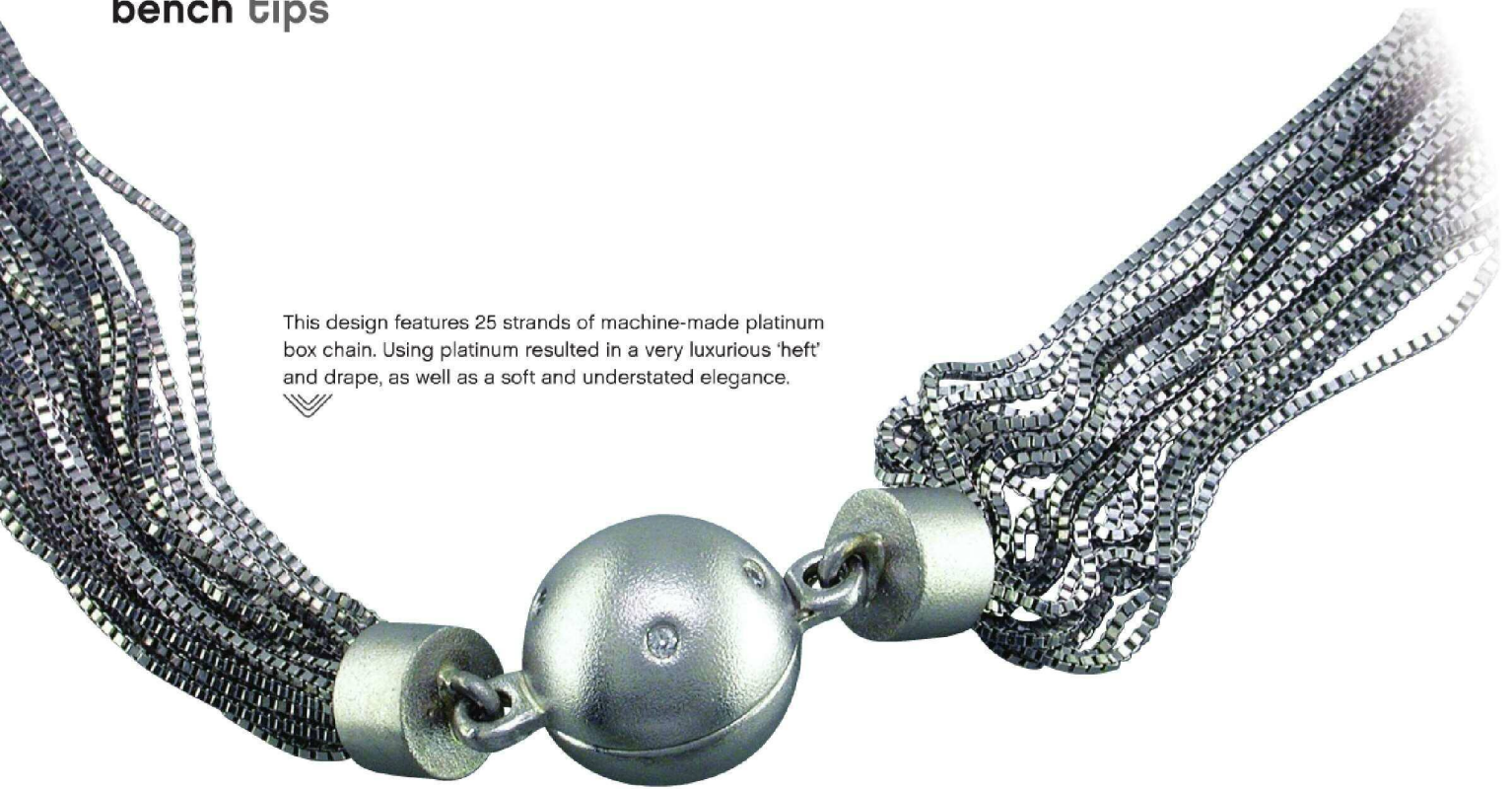
Platinum use for jewellery peaked worldwide in the early part of the 20th century. However, it also has other very important applications in science and technology. Since it is inert, platinum can be used as a catalyst in many industrial processes, and in fact, jewellery use accounts for less than 25 per cent of global platinum consumption. Today, more than 50 per cent is used in the auto industry in catalytic converters, while the remaining 25 per cent is used for other industrial purposes. It was so important that platinum was declared a strategic metal during the Second World War and its use was barred by governments

for all non-military purposes. This ban prompted the development of white gold as a replacement for platinum, and it has taken many years for the latter to regain its former lustre in the jewellery industry.

While platinum remained a popular choice for the highest echelons of jewellery design after the war, it made a major resurgence some 20 years ago, mainly due to extensive promotion carried out by Platinum Guild International (PGI) and designers like Scott Kay. Consumers were bombarded by advertisements promoting it as the best possible metal for fine jewellery.

Many jewellers would argue this is only partly the case. When used in the right application, in certain alloys, and incorporating correct techniques, platinum is indeed a superior choice for some jewellery. However, just because you can make jewellery from platinum does not necessarily mean that you should. When designing with platinum, it is important that you consider all factors of a piece and prepare the client with the advantages and disadvantages of using this metal in a particular application. Doing so can help avoid a disappointed customer coming back to you after they have had the piece for a few months and realize it isn't what they expected.

bench tips



This design features 25 strands of machine-made platinum box chain. Using platinum resulted in a very luxurious 'heft' and drape, as well as a soft and understated elegance.



Let's look at some of the pros and cons of platinum for jewellery use.

Pros

- Platinum provides the best, most neutral white colour of all the jewellery alloys. Some new white gold alloys come close, but nothing is as white as platinum for most purposes. This is especially true for a diamond setting, since its pure colour accentuates the sparkle and brilliance of the stone without reflecting any colour in it.
- It takes approximately 10 tonnes of platinum ore to produce one ounce of pure metal. By comparison, it only takes three tonnes of ore to produce one ounce of gold. This contributes to platinum's appeal as a luxury metal. Platinum is 50 per cent more dense than 18-karat gold, giving a platinum piece a satisfying 'heft.'
- Platinum has a much higher melting point than gold. This permits the creation of two-tone designs by starting with a platinum component and later casting or fusing yellow gold accents without affecting it.
- Platinum alloys used in jewellery applications are usually 90 to 95 per cent pure and incorporate one or more of the other platinum group metals, while the majority of gold jewellery contains a maximum of 75 per cent pure gold, which further adds to platinum's luxury cachet.

- Most platinum alloys will not tarnish, even when heated to white hot. This is a major advantage during fabrication and finishing, since it is possible to pre-polish a component prior to soldering or welding it to another component. This is not possible with gold alloys, which oxidize when heat is applied.
- Hand-fabricated platinum jewellery takes full advantage of the inherent tensile strength of the metal, allowing a jeweller to create incredibly delicate elements that are still durable and hard-wearing.
- Provided they are adequately informed, most consumers will appreciate the patina of surface scratches that result from normal wear. Although they can be removed by polishing, the natural patina that develops actually lets gemstones take centre stage, while the metal provides a more subtle supporting role.
- Platinum is a poor conductor of heat, which can give it an advantage over gold during assembly using a torch and especially with the laser welder.
- Platinum is hypoallergenic, meaning it can be tolerated by almost everyone, even those who otherwise react to other metals when in close contact with their skin.
- Its ductility and malleability offer advantages in strength and durability, especially for securing gemstones in fabricated items. There is less 'spring' to the metal and a claw pushed over a gemstone does not bounce back the same way a more brittle white gold claw does. Platinum claws do not work-harden as quickly as white gold, and there is less chance of a claw simply shearing off due to internal stress.

Rose gold shank and hand-fabricated head for blue sapphire. Platinum provides maximum contrast to the rose gold. >>>



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'Heartfelt' halo setting for heart-shape diamond. The metal takes a 'back seat' to the diamonds' brilliance. The beads for the pavé can be more delicate and subtle than would be necessary with white gold and the stones are set very securely.

- A platinum piece has greater long-term durability, even though it may appear more delicate than a similar gold item. That's because the metal compacts and compresses with time and wear, and actually increases in strength. White gold is rather brittle and abrades much more quickly.

Cons

- Some clients find the greater weight of a platinum piece uncomfortable.

- Platinum is more expensive than white metal alternatives, although since cost is actually driven by its use in the auto sector, the metal has occasionally dipped below the per-ounce price of gold, particularly in a tough economic climate and during slumps in the auto industry. Platinum is also more dense than gold, which means it takes more pure platinum than pure gold to craft the same piece of jewellery. This drives the final price well above karat gold.
- Platinum takes longer to finish and polish. Although its malleability is an advantage for long-term wear, it also means the goldsmith must use ever-finer grades of sandpaper prior to abrasive compounds on the polishing lathe and the final polish with rouge. Any minor surface flaw is simply magnified as the polishing process proceeds. This requires both higher skill level and simply more time to achieve a perfect finish. The extra time factors into the increased price, as well.
- Platinum's high melting point requires proper torches and casting equipment, as well as special investment and technique. Platinum must be kept separate from other metals to avoid contamination. A tiny piece of steel or gold can become incorporated into a piece of platinum and ruin it. Refining of scrap metal is very expensive and you need a large amount of scrap to make it economical. This adds to the cost of using platinum.
- When cast by an inexperienced craftsman, platinum is rather soft and porous. I compare it to sponge toffee candy. It may look fine after finishing and polishing, but within a few weeks of normal wear, it starts to compact and compress and looks like it was beaten with a hammer. This can be a problem in particular with large cast pieces or those that are blocky solid forms.

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Creative metallurgists, such as the late Steven Kretchmer, developed platinum alloys that solved some of the issues with cast designs, as they can be hardened post-casting by using a specific protocol of heating and cooling. These alloys permit durable tension-style settings that were not practical with traditional mixes. However, some of these oxidize with heat, which requires extra steps to remove in the final finishing steps. In addition, some of them are slightly magnetic, which must be taken into consideration to avoid contamination with fragments of ferrous metal. This property was exploited by Kretchmer with another special alloy incorporating floating components that appear to defy gravity.

Alternatives to platinum

When use of platinum was banned, jewellers had to come up with other options to meet the demand for white metal jewellery. This led to the development of white gold alloys. Nickel is commonly used as a bleaching agent in white gold alloys. Unfortunately, nickel and gold are not very compatible, making it necessary to use small amounts of copper and silver to improve the workability of white gold alloys. This, of course, dilutes nickel's effect as a bleaching agent and the resultant alloys are varying shades of 'almost' white. In addition, some of the alloys are whiter when freshly polished, but eventually tarnish and need to be re-polished at intervals. They may look fine on their own, but when used as part of a two-tone piece with yellow or rose gold, the degree of contrast between the two metals will be rather disappointing.

Of course, the vast majority of commercial white gold jewellery in North America is electroplated with rhodium to give it an attractive white colour. Yet, this plating is only skin deep; it wears off rather quickly and needs to be re-applied to maintain the white colour. This is especially true for rings and bracelets, which are subject to more vigorous wear. Many clients are not told their new ring has been electroplated and are

disappointed to discover they will need to keep bringing it back for re-plating. Nickel-based alloys are also an issue for the minority of clients who have varying degrees of allergy to even the small amounts of the metal in a piece of jewellery. Some only react to the intimate contact of earring posts, while others can get a rash from a delicate nickel-alloyed chain. Most European countries have banned the use of nickel in white gold alloys due to common allergies to this base metal.

Palladium, another of the platinum group metals, is an alternative to platinum. In its pure form, it is far too soft to craft durable jewellery and is therefore typically alloyed with gold and other noble metals to harden it. It isn't quite as pure a white colour as platinum, being on the grayish side, but it has seen increased use in recent years. Palladium alloys can offer the advantage of significantly lower price points and also the same hypoallergenic qualities of platinum.

It is important to make an informed choice when deciding which metal to use for a particular purpose. Communication with your client is critical to ensure they are aware of the pros and cons of the various metal choices. There is a perfect metal for every application and the right choice can result in a beautiful jewel and a satisfied client. ♦



Lyn L. Strelau is the owner of *Jewels by Design*, a designer-goldsmith studio in Calgary established in 1984. His firm specializes in custom jewellery design for a local and international clientele. Strelau has received numerous design awards, including the American Gem Trade Association's (AGTA's) Spectrum Awards and De Beers' *Beyond Tradition—A Celebration of Canadian Craft*. His work has also been published in *Masters: Gemstones, Major Works* by Leading Jewelers. Strelau can be reached via e-mail at designer@jewelsbydesign.com.