JUNE 2022

Set of Spanish Stamps

DIARY

June	***4***	***10:00–14:00***	***Open to the Public Day – Rocks, gems, jewellery, mineral specimens to look at, chat about, swap, sell or buy. MASKS MUST BE WORN IN THE CLUBHOUSE.***
July	***2***	***10:00–14:00***	***Open to the Public Day – Rocks, gems, jewellery, mineral specimens to look at, chat about, swap, sell or buy.***

An Iconic Mineral of the Ukraine: Gemmy Heliodor Beryl

By
Peter Rosewarne

Introduction

With the Ukraine forming a daily part of the news over the past few months, it seemed fitting to feature its most iconic mineral, gemmy *heliodor beryl* crystals from the Volodarsk-Volynski district of Zhitomir Oblast (an unfortunate word in the context of the situation but it means province) in a MinChat article. This area is located in north-central Ukraine (see **Figure 1**, with permission from the Mineralogical Record, MR) and the pegmatites there were mined primarily for *piezoelectric*[1] grade *quartz* for supply to the Red Army. Mining officially ceased in 2009.

< Ukrainian Coat of Arms

[1] Piezoelectricity (also called the **piezoelectric effect**) is the appearance of an electrical potential (a voltage, in other words) across the sides of a crystal when you subject it to mechanical stress (by squeezing it).

Figure 1: Locality. Map (courtesy of the MR)

Background

First a word of thanks to the authors of "*Famous Mineral Localities: Volodarsk-Volynski, Zhitomir Oblast, Ukraine*," in the Mineral Record Vol. 40 No.6 (Lyckberg, Choronousenko and Wilson, 2009) for much of this background material. Heliodor is the yellow variety of the silicate mineral beryl, $Be_3Al_2Si_6O_{18}$, which crystalises in the hexagonal system and has a hardness of 7.5-8. Its yellow colour is mainly due to traces of iron in the beryl structure. It was first named from specimens from the Rössing pegmatites in Namibia in 1910. The name is derived from the Greek words "doron" and "helios" meaning gift from the sun. Many of the Ukrainian heliodor crystals show characteristic etched faces, as can be seen in many of the photographs to follow.

The pegmatite bodies discovered in the Volodarsk-Volynski area have massive crystal pockets with a structure that had never been seen before. Consequently, a new term was coined to describe them, "Volynian chamber pegmatites". The largest of these chambers measured between 5 000 and 8 000 m^3. That's some pocket!
The pegmatite field consists of hundreds of pegmatites and they, or their associated chambers, are known by numbers, the most productive one being pegmatite #521. About 2 500 kg of beryl was recovered from this chamber. The most common mineral was quartz in massive crystals up to 10 t in weight. Only 2% of the pegmatites contained gem beryl, while about 10% contained gem topaz. Associated minerals were feldspar and muscovite. About 3.5 t or more of gemmy beryl were collected with individual crystals up to 1.2 m and *c*.66 kg, although this one was recovered in six pieces. Thousands of crystals were collected. Apparently, beryl and *topaz* are *antipodal* in these pegmatites and did not form together, i.e. if one was forming the other was being dissolved.

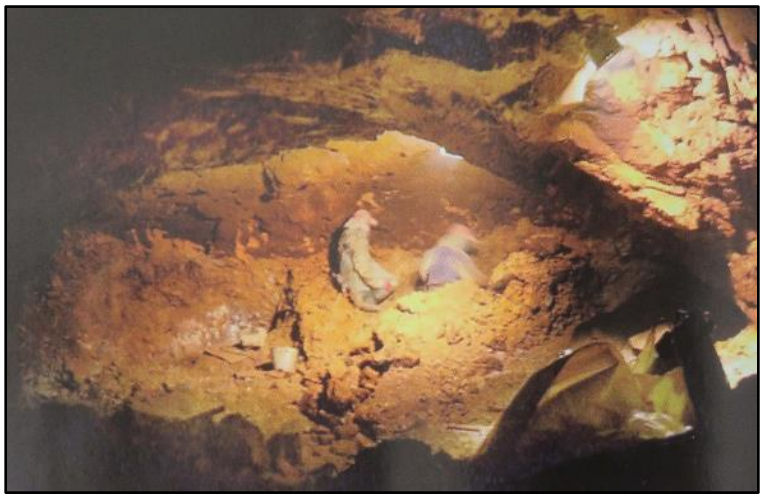


Figure 2: A Chamber in one of the Pegmatites (courtesy of the MR)

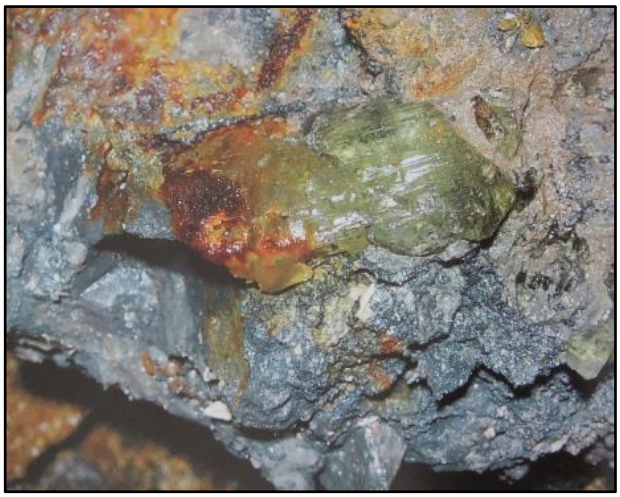


Figure 3: In Situ Beryl Crystal (courtesy of the MR)

The only 'flaw' I can find in these specimens from the Ukraine is that they are all single crystals without matrix. That is because the matrix was decomposed granite and the crystals were either found detached on the floors of the cavities or else the matrix disintegrated after being bought to the surface. Good crystals >10 cm in size would sell in the five-figure US$ range.

The Crystals

OK, enough of boring background information, let's get down to examples of some of the beautiful crystals that have emerged on the market over the past 40 years or so. The pictures are either from dealer sources such as Fabre Minerals, Wilensky Fine Minerals and Crystal Classics, with permission granted, or are photographs by myself of photographs, also with permission granted.

The cover of the Mineralogical Record Volume 40, No 6 of November-December 2009 (**Figure 4**) says it all about these crystals in my opinion; colour, form, texture and size – stunning! The middle crystal is 22 cm and is known as the "Dnieper Rocket." The first crystals to appear in Europe in the 1980s apparently didn't sell initially because they were so perfect that people thought they must be Russian (this was before the break-up of the USSR) fakes! Drool on…

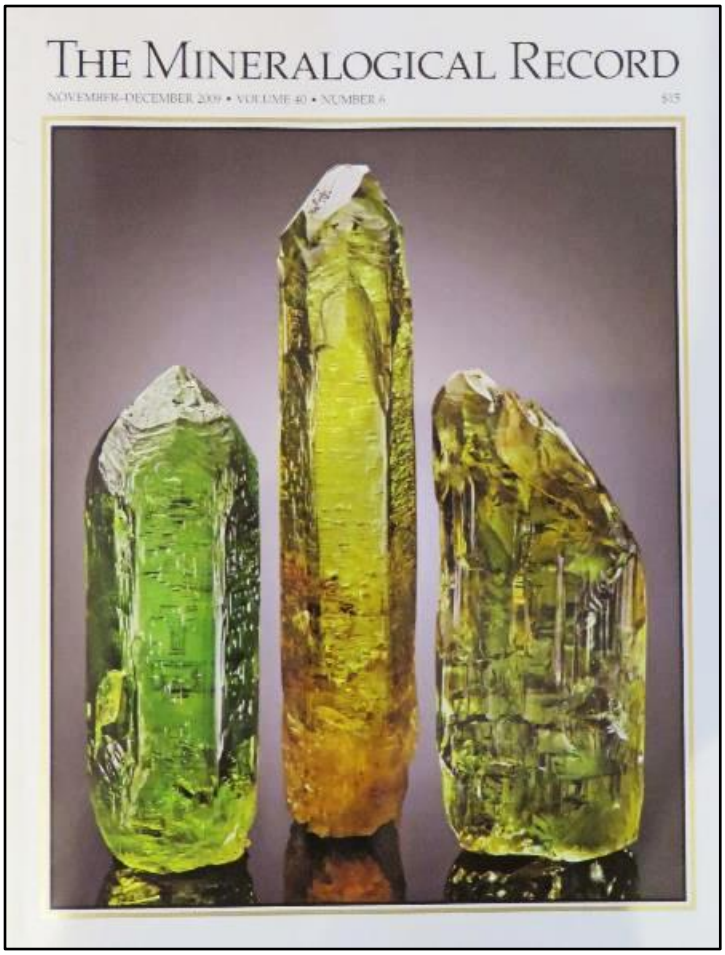
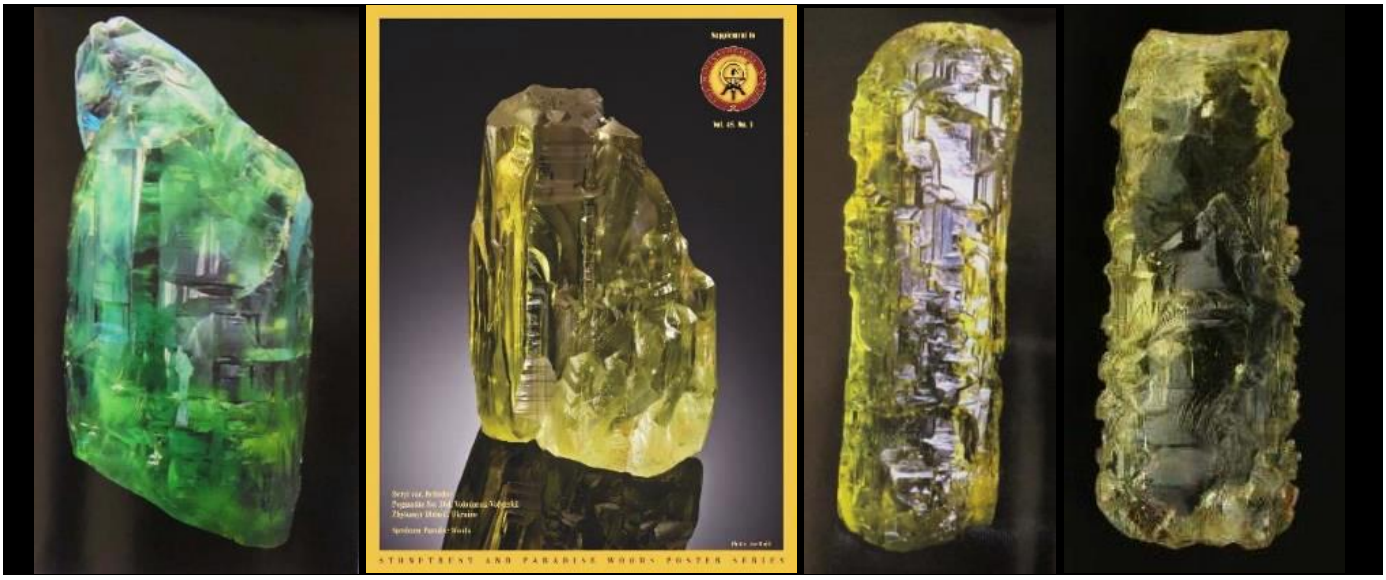


Figure 4: Front Cover of The Mineralogical Record, Vol. 40 #6, 2009 (courtesy of the MR)

Left. Figure 5: Pale Green Non-Etched Crystal (courtesy of Crystal Classics)
Middle. Figure 6: 5.2 × 2 cm Etched Crystal (courtesy of Fabre Minerals)
Left. Figure 7: 10.1 × 5 cm Crystal (courtesy of Wilensky Fine Minerals)



Left. Figure 8: 18 cm Green Crystal (Courtesy of the MR)
Centre Left. Figure 9: Crystal from Pegmatite #364 (courtesy of Stonetrust-Paradise Woods)
Centre right. Figure 10: 16.5 cm Crystal (courtesy of the MR)
Right. Figure 11: Rosey Collection Crystal, 3.5 × 1.4 cm (courtesy of Crystal Classics)

Concluding Remarks

Personally, I think these are some of the most beautiful crystals that have ever been found and they are far more impressive as natural crystals than as cut gems, as many of the best crystals ended up being. It is unlikely that any new finds will come onto the market as the mines are closed and the remnants have been picked over intensively. The Russian invasion of the Ukraine has apparently displaced more than 5 million people west into Europe and some of these may perhaps have a crystal or two that they will be looking to sell. Otherwise, it will be recycled existing specimens for some lucky collectors and sumptuous photographs for the rest of us. Hopefully, the Museum of Precious and Decorative Stones in Volodarsk-Volynski, where many of the local heliodor crystals are housed, has escaped the devastation of the Russian invasion (see **Figure 13**).

Figure 12: Museum of Precious and Decorative Stones, Volodarsk-Volynski

References

Falster, A. *et al* Eds (2005), *Beryl and Its Colour Varieties*. Lapis International, LLC. Connecticut.
Mineralogical Record (2009), *November-December 2009, Vol. 40 No. 6*. p 473-506.Tucson.

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Rocks, Mines, Minerals and Gems on Postage Stamps

by

Peter Rosewarne

Introduction

The humble postage stamp – does anyone still use them? In South Africa they have transformed into a sort of good luck sticker that you affix to mail in the hope that it might one day reach its destination. Worldwide, they have probably been the subject of the most varied artwork in history, commemorating *inter alia* kings and queens, VIPs, history, sport, transport, space, historical events and buildings, human endeavour and triumphs and natural history, the latter including rocks, mines, minerals and gems.

The first adhesive postage stamp was the Penny Black, introduced in Great Britain in 1840. The first stamp commemorating a gem was apparently issued by Colombia in 1932, unsurprisingly, featuring *emerald*. Many African states depend upon minerals to drive their economies, which explains why, e.g. Sierra Leone issued more than 35 stamps on the subject of diamonds between 1965 and 1978. And why over 77 per cent of mineral stamps come from countries with major mining interests. Countries with traditional links to the history of the study of geology and mining also produce mineral stamps. These are usually European countries with a long record of these studies, such as Germany, although, despite its fine tradition of geological observation and research, the United Kingdom has apparently never produced a stamp depicting rocks or minerals.

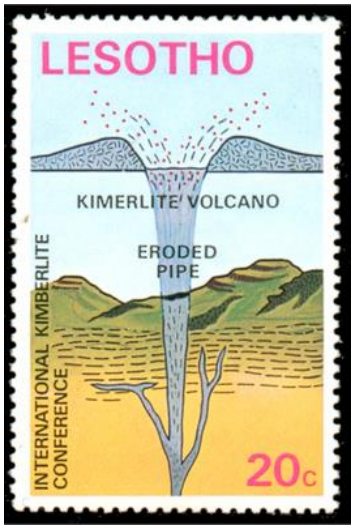
I came across some examples at a flea market some years ago and bought a few sets from Namibia, Kenya and Botswana and unearthed them again when researching for the botryoidal article in the previous Minchat and hence the idea for this article. Otherwise, I have sourced what are marked as free stock images from the internet and mostly concentrated on Africa. I was amazed at the wealth of examples available on what I expected to be a fairly arcane and specialised subject.

The logical sequence for these four topics seems to me to be rocks, mines, minerals and gems. Nothing technical in this one so now it's straight into some pictures. Read on…

Rocks

We'll start with the Baltic Shield and Finland or Suomi, a country close to my heart from a geology point of view, being a 'hard-rock' man (in more ways than one 🎸), and a romantic one back in the early 70s, but that's another story. **Figure 1** is of one of my favourite rocks, orbicular granite, and a more mundane veined gneiss. When on a student trip to Finland in 1973, we tried to locate the orbicular granite occurrence near a town called Kangasala but couldn't find it. No cell phones or internet with GPS coordinates in those days. I don't think those two rocks would be very productive for minerals so moving on to **Figure 2** which shows the formation of a *kimberlite* pipe and the rock kimberlite in Lesotho, where some of the largest coloured *diamonds* have been found.

Figure 1: Orbicular Granite and Veined Gneiss



< Figures 2: Kimberlite Formation and Rock, Lesotho. V

Figure 3 below shows *marble* from Madagascar and *lapis lazuli* from Chile (check my article "Lapis Lazuli: East meets West" for an explanation as to why this is classed as a rock and not a mineral).

Figure 3: Marble, Madagascar and Lapis Lazuli, Chile

Figure 4: Olivine Dolerite in Thin Section, France

Can you believe it, there is even a stamp showing a rock in thin section, in this case *olivine dolerite* (Figure 4).

Mines

We start with a 1991 set from Namibia that was part of my flea market purchase. These mines cover *lead*, *zinc*, *copper*, *uranium*, *diamonds* and *tin* and include the world-famous Tsumeb Mine, as shown in **Figure 5 below**. Who's got a full-house of site visits to these mines?

Figure 5: Oranjemund, Tsumeb, Rosh Pinah, Uis and Rössing Mines

Figure 6 is a stamp set that Jo Wicht bought in Aus, commemorating diamond mining in Namibia, not knowing that it would fit very nicely into this article.

Some random choices follow in **Figures 7** and **8** from Australia, Canada and South Africa.

Figure 7: Australian Open Cast and Canadian Underground Mine Stamps

Figure 8: South African Gold Mining Stamps

Minerals

First up is a set of 1c – R1/P1 stamps from Botswana dated 1976, which depict a mix of rocks, minerals and diamond, some of which are shown in **Figure 9**.

Figure 9: Botswana Minerals Series, 1976

Next is a self-explanatory set from Namibia, issued in 1991, also part of my flea market purchase (**Figure 10**). The R2 stamp depicts *gold*; who knows the name of Namibia's only gold mine? Answer at the end of this article.

Figure 10: Namibian Minerals Series, 1991

Figure 11 below shows a nice selection of minerals from the USA.

Figure 11: Minerals of the USA

And finally, minerals on a 1994 set of Spanish stamps, cinnabar, pyrite, sphalerite and galena, and the Institute of Geology and Mining Museum, Madrid.

Figure 12: Set of Spanish Stamps

Gems

I guess the No 1 gem in the World is diamond, so this is as good a place to start as any and with the selection in **Figure 13**. The Royal Mail Sovereign Sceptre stamp shows that, while the UK may never have produced a stamp specifically themed with rocks or minerals, many of its issues are literally dripping with diamonds and other gems, especially when the Queen is depicted wearing a selection of her jewellery/the Crown Jewels. This one holds the *Cullinan 1* or *Star of Africa* at 530.2 carats. The *Cullinan 1* and *11* postage stamps issued in 1980 by South Africa flank it.

Figure 13: Selection of Diamond Theme Stamps

The left hand one of the red stamps at the bottom of this figure features an unusual diamond, the *Shah Diamond*, with inscriptions of the three historical owners. It is an elongated octahedron that has been faceted. It used to be part of the Russian Crown Jewels but is now housed in the Kremlin. If you are interested in history, have a look at the information on *Wikipedia*.
Coloured diamonds are relatively common in Lesotho diamond mines, e.g. at the Letśeng Mine (**Figure 14**).

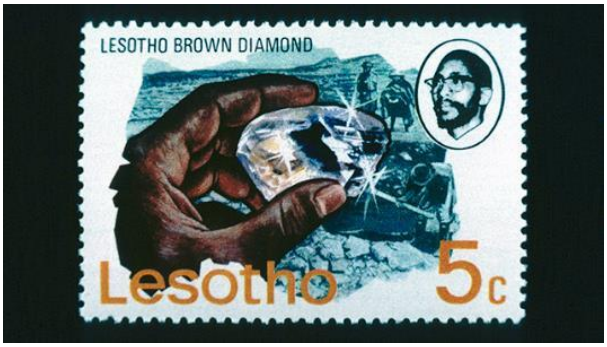


Figure 14: Brown Diamond, Lesotho

When it comes to coloured gems and Africa, countries that readily come to mind are Tanzania, Namibia, Botswana, Kenya, Zimbabwe and South Africa. Perhaps two of the most iconic gems are *Tanzanite* (var. of *zoisite*) from Tanzania (**Figure 15a**) and *Tsavorite* (var. of *garnet*) from Kenya. I couldn't find a tsavorite stamp from Kenya so here's one from Niger of all places (**Figure 15b**).

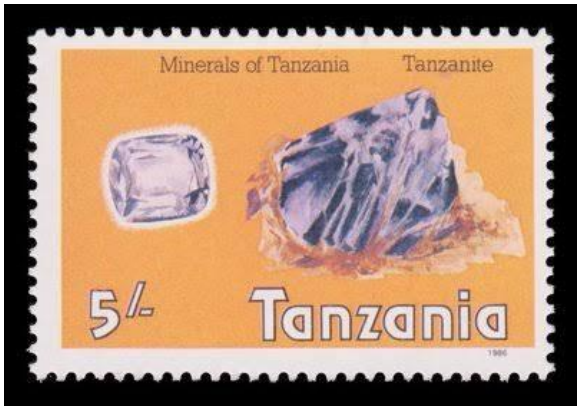


Figure 15a: Tanzanite

Figure 15b: Tsavorite

The gem stamps from Zimbabwe in **Figure 16** are nice visually and also interesting for the values of the stamps; 1 – 7 c, which reflects a pre-hyperinflation Zimbabwe Dollar denomination when they were issued in 1980. Happy days.

Figure 16: Gem Stamps from Zimbabwe, 1980

Opal is the iconic mineral of Australia and is commemorated in the stamp shown below in **Figure 17**.

Figure 17: Black Opal, Australia

Last up on gems is a mixed mineral and gem issue of 1977 from Kenya in **Figure 18**. The last four depict *tourmaline*, *aquamarine*, *sapphire* and *ruby*, a fitting gem to end on as, carat for carat, I think ruby is the most expensive gem if flawless? Or is it emerald?

Figure 18: Minerals and Gems, Kenya 1977

To finish off, I came across this 'chat-board' for mineral stamp collecting shown in **Figure 19**. I won't spoil your fun by explaining how it works. It also fills some gaps in the coverage of gems such as *topaz* and *spinel*.

Figure 19: Chat-board for Mineral Stamp Collecting

This article could carry on *ad infinitum* given the wealth of examples available on the Internet, so we'll end here and doff a cap to the venerable postage stamp and the wonderful examples of artwork of rocks, mines, minerals and gems that it has been host to over the years.

And finally, we have the General Law of Postal Dynamics (*Eq1*), not to be confused with the Special Law, which relates only to mineral specimens, which states that:

……*Eq1*

Which, in layperson's terms, can be simplified as "RIP SAPO".

References

Glover, P. (2010), *Minerals on postage stamps: A mix of art, history, economics and geography*. EGU General Assembly. Vienna.

Answer to question: Navachab (I may be out of date on this)

From the Cabinet of Curiosities

New Minerals

Fleischer's Glossary of new minerals 2022 is out and lists 5 739 species compared to 5 083 in 2018. My MinChat article on mineral species referenced 5 762 as of November 2021. (Hazen, R.M. (2015), *Mineral Evolution*. The Mineralogical Record, November-December 2015. Vol. 46 No. 6. p805-812. Tucson.) However, Fleischer's does list 239 'pre-approved' minerals by the IMA not included in their count and so my quoted figure could be correct. I wonder if there is a complete collection anywhere in the World? PR

Describe your own original curiosity and send it to us with a photo.

FaceTips

FACETING THE SOFTIES

Duncan Miller

Cerussite 75.42 ct	Sphalerite 63.02 ct	Fluorite 16.20 ct	Cuprite 29.18 ct	Barite 5.3 ct

Having facetted several of the gemstones 5 and below in hardness –apatite, barite, cerussite, cuprite, fluorite, and sphalerite – I can offer some general advice about how to deal with these often-troublesome materials. The essential thing is to avoid any thermal shock. This requires a modified dopping technique, and often extra care when polishing. First study the rough carefully to identify the cleavage planes and plan the cutting to avoid all of these if possible. Then, using a 1200 mesh lap, by hand grind a flat where you want to place the table facet. Clean the stone thoroughly and stick the pavilion-to-be to a dop with Prestik (or 'blutack' or dental wax). Select a suitable flat dop, heat it, and apply a layer of wax to the face. Build this up to an even layer at least 3 mm thick, and while it is soft flatten it against another flat face dop in a transfer fixture. Remove it from the transfer fixture and set it aside to cool thoroughly, replacing it with the dop holding the stone. Orientate the stone appropriately and press the table-to-be against the initial flat dop to position the stone for dopping. Replace this flat dop with the one with the wax layer. Coat the wax surface with your glue of choice, either superglue or epoxy, and slide the dops towards each other so that the table-to-be seats firmly against the flat wax surface. Let the glue set and then facet and polish the pavilion.

Transfer dopping can be done in one of two ways. The more risky way is to prepare a suitable pavilion dop with plenty of dopping wax and allowing it to cool until it just takes an indentation using a fingernail. In the transfer fixture slide the stone into the just pliable wax and quickly out again, to create an impression of the pavilion. When the wax has cooled completely you can glue the pavilion into the impression with the glue of your choice. After the glue has set, wrap the stone and the new dop in a strip of water-dampened paper towel. Hold the stone with your fingers – it must not get hot – and heat the first dop until you can just twist it off the initial wax layer, leaving the wax on the stone. Your transfer is done.

The less risky way it to have a set of anti-dops at hand (Figure 1), as described by Tom Herbst in his *Amateur Gemstone Faceting*. Select one with a shape that approximates the pavilion and using it in a transfer fixture make an impression in hot wax in a suitable pavilion dop. After the dop has cooled, replace the anti-dop with the one holding the stone, and glue the stone in place. For this, epoxy is preferrable to using superglue, because there will be some mismatch between stone and wax with gaps that need to be filled. (I suppose you could use a gap-filling epoxy, but I don't have any.) After the glue has set, wrap the stone and the new dop in a strip of water-dampened paper towel. Hold the stone with your fingers – it must not get hot – and heat the first dop until you can just twist it off the initial wax layer, leaving the wax on the stone. Your transfer is done.

With either transfer technique, after transfer DO NOT use a hot blade to remove the excess wax adhering to the crown-to-be of the stone. The hot blade will destroy your stone (Figure 2). Grind off the wax carefully on a 600 mesh lap, leaving just a thin film to avoid damaging the stone. When dopping or transfer dopping with superglue, it helps to coat the join with clear nail varnish, to protect the superglue join from softening in water, especially with smaller stones.

Initial facet cutting of soft stones I usually do on a 1200 mesh diamond sintered bronze lap, with fine cutting with 8000 mesh diamond paste on a copper lap or a tin alloy lap, like BATT™. Some stones behave better on the softer tin alloy lap. You need to experiment. Polishing also calls for experimentation with different lap and polishing medium combinations. I have settled only two laps – a wax lap and a LIGHTSIDE™ lap from Gearloose (https://gearloose.co/). On the wax lap one uses water and oxide pastes, either tin oxide or aluminium oxide, whichever works. It does round the facet edges somewhat, which is more noticable on smaller stones than larger ones. I have found the wax lap essential if a facet needs to be polished close to a cleavage plane. Most soft stones will polish easily on a Gearloose

LIGHTSIDE™ lap, using 100 000 mesh diamond paste and an oily lubricant. I use WD40. The lap is just damp, with very little diamond paste, and wiped almost dry. Polishing is at slow speed, with just enough pressure to create some drag. Too much lubricant and the stone will just slide on the surface. Too much diamond paste and the stone will scratch. If a facet scratches persistently, reverse the lap direction. Inspect the stone after each 5 or 6 sweeps of the lap, and beware of any heat build-up, which may open up cleavages.

There is no single solution to the difficulties encountered in polishing soft stones. It takes patience, and trial and error to discover just the right touch to produce a good polish. When the crown has been completed, heat the dop just sufficiently to release the wax. Do not try to remove the wax adhering to the stone, but soak it in alcohol overnight to dissolve the wax, and then in acetone to dissolve any remaining glue.

Figure 1 left. Anti-dops for cones, keels and trilliant pavilions
Figure 2. A 20 × 10 mm barite from Brukkaros in Namibia, with cleavage fractures caused by using a hot blade to remove excess wax after transfer – a not-to-be repeated mistake.

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