



News from the SSEF 2018:

On a colourful journey to exceptional gems and pearls



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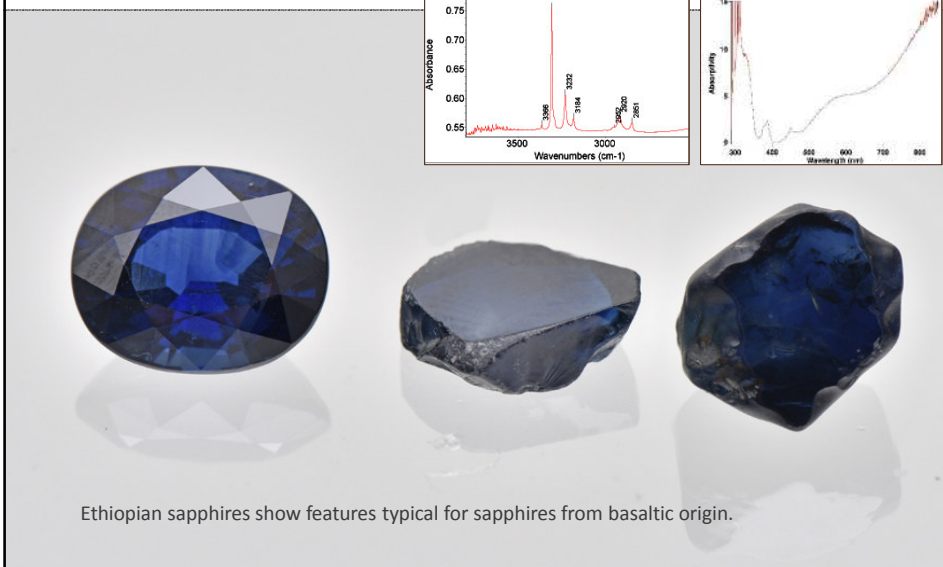
Recently in the spotlight
Gem Deposits in Ethiopia



Photo © S. Hänsel, SSEF

Photo © S. Hänsel, SSEF

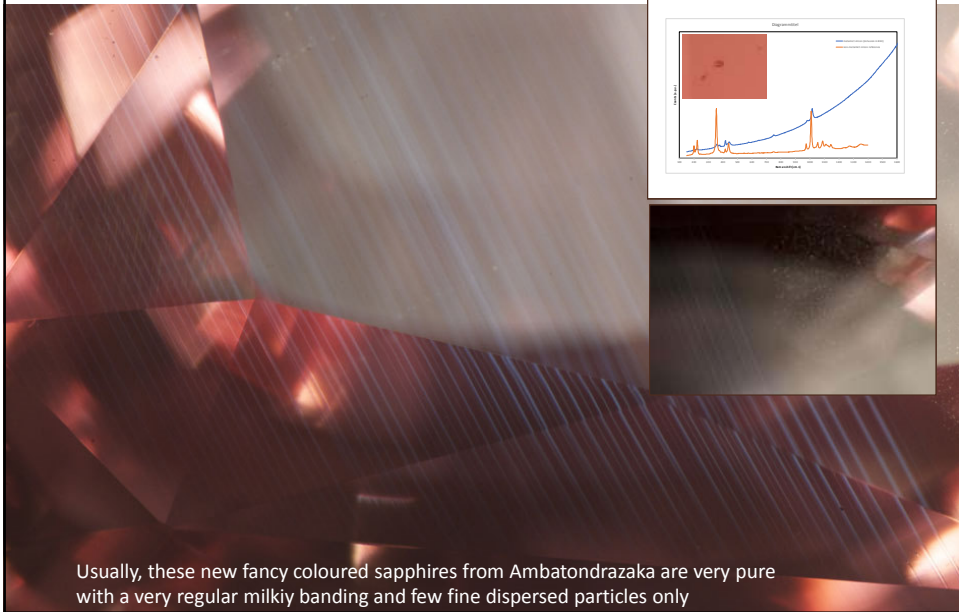
Recently in the spotlight
Sapphires from northern Ethiopia



Ethiopian sapphires show features typical for sapphires from basaltic origin.

Recently in the spotlight

Fancy Sapphires from Ambatondrazaka, Madagascar



Usually, these new fancy coloured sapphires from Ambatondrazaka are very pure with a very regular milky banding and few fine dispersed particles only

Research

Fancy Sapphires with unstable Padparadscha-like colour



After 5 minutes "activation" using a UV lamp the colour has considerably changed. But unfortunately this new colour will slowly fade again to pink in the coming few weeks...



Research

The case of yellow sapphires with unstable colour



Seven types of yellow colour cause in corundum:

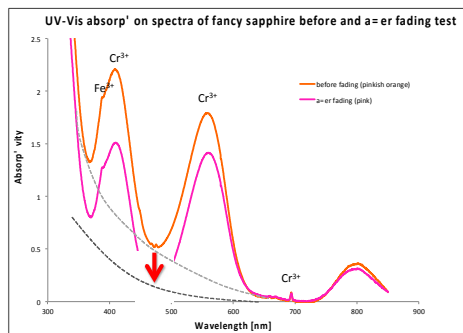
- 1) Natural stable colour centre
- 2) Natural or laboratory-irradiated fading colour centre
- 3) Natural iron-related stable colour
- 4) Heat-developed stable yellow colour
- 5) Diffusion related "additive" colour
- 6) Synthetic with impurity-caused colour (e.g. nickel)
- 7) Synthetic with irradiated fading colour centre



Nassau & Valente, 1987

Research

Fancy Sapphires with unstable Padparadscha-like colour



Since mid 2017, SSEF applies colour stability test on padparadscha sapphires !

The colour of the stones are analysed before and after UV activation and fading test to determine their colour stability or instability !

In case the tested stone shows a distinct shift, SSEF will not identify these stones as padparadscha, but as **fancy sapphire**, adding a comment (and explanation letter) about their unstable colour.

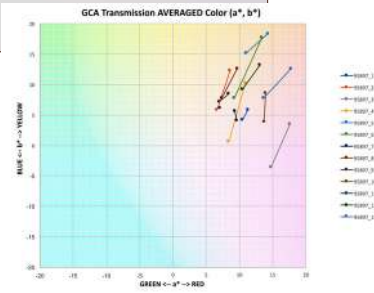
Research

...but not all Padparadscha's are unstable



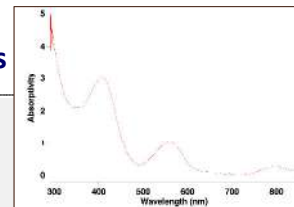
Series of "padparadscha" sapphires from Madagascar (mostly Ilakaka) after fading (initial stage) and after UV activation.

Most do show a weak colour shift, but remain in the padparadscha colour field !



Flame fusion synthetic corundum

...and not all Padparadscha's are real gems



Flame fusion (Verneuil) synthetic corundum coloured by traces of chromium and nickel !

Research

Three cases of Padparadscha-like colours

From our studies we can separate **three** colour stability cases in corundum with padparadscha-like colour involving yellow colour centres (type 1 and 2 after Nassau):

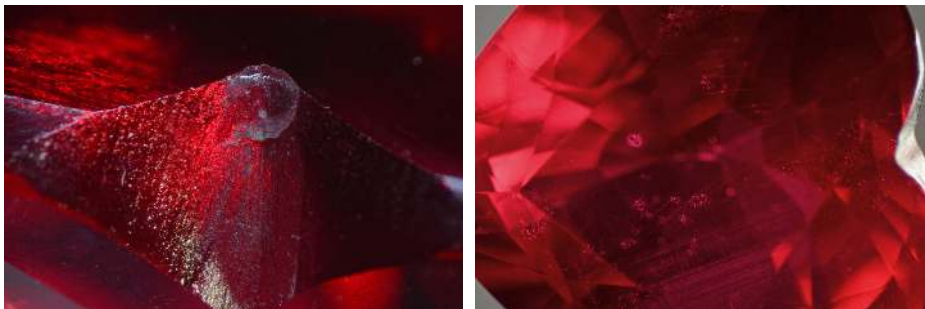


- A) Stones with **stable** pinkish orange colour as a result of chromium traces and a stable yellow colour centre. If fitting in colour and saturation, they will be identified by SSEF as **padparadscha**.
- B) Stones with **only weak colour shift** by UV activation or fading test, owing their pinkish orange colour a mix of chromium traces and predominatly a stable yellow colour centre with only minor contribution by an unstable yellow colour centre. As long as the colour after UV activation and fading test fits, they will be still called **padparadscha** on SSEF reports.
- C) Stones with a **distinct colour shift** from pink (stable colour) to pinkish orange (unstable), owing their colour a mix of chromium traces and predominantly an unstable yellow colour centre. These stones are **not** qualifying at SSEF to be called padparadscha, but will be identified as **fancy sapphires** with a comment about their **unstable** colour property.

Treatment issue

Low-T heating of Mozambique rubies

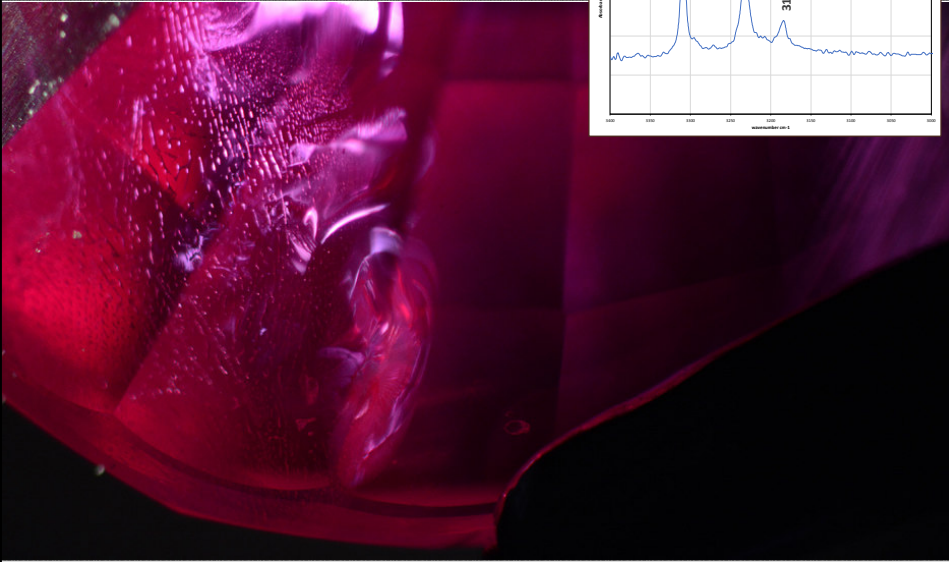
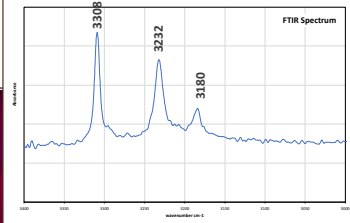
Recently we see more rubies from Mozambique which have undergone a low-T heat treatment (e.g. 800 °C), presumably applied to slightly shift the colour to a more attractive red hue.



Glass residue at girdle (left) and atoll-like structures in these two low-T heated rubies from Mozambique.

In many cases, the inclusions in these rubies are not or only very slightly altered by this low-T heating. It is thus quite challenging for gemmologist to detect such heating in comparison to rubies classically heated at about 1400 °C.

Treatment issue
Low-T heating of Mozambique rubies



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Clarity modification in gems
Fissure filling in Ruby and other Gems



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SSEF


Clarity modification in gems
Oil/Wax Fissure filling

SSEF is disclosing fissure fillings in any gemstone based on international standards (LMHC) and our SSEF emerald wording policy.

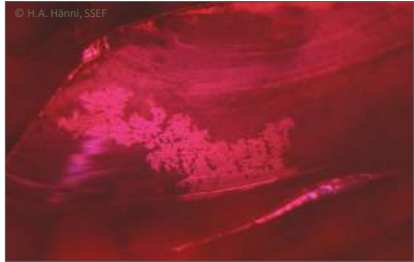
Quantification: minor, moderate, significant
 Identification: (coloured) oil, wax, artificial resin

Please remind:
 Rubies, especially unheated ones from marble deposits such as Mogok are quite often and traditionally filled with oil or wax.

Any gemstone with fissures can be filled with oil or other filler to enhance/modify its clarity !




Ruby with orange oil, apparently influencing its colour



Fine dendrites in oil filled fissure in a ruby.



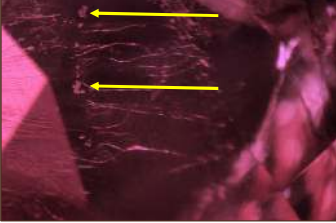
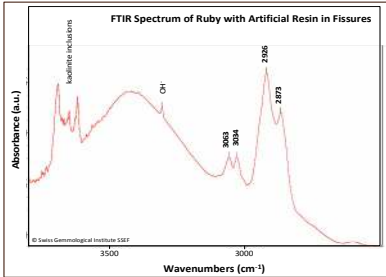
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Clarity modification in gems
Artificial resin in ruby fissures


Recently encountered series of Burmese rubies (Mogok) with artificial resin in fissures !

www.ssef.ch/artificial-resin-in-ruby/

We hope (and urge the trade to take action) that this new treatment is not spoiling the ruby trade in the future.

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Heated and fissure filled with artificial resin
Paraiba Tourmaline


Purple flash effects along fissure filled with artificial resin



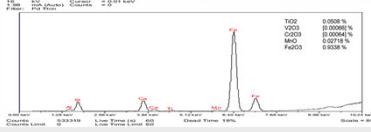
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Rare collector stones
Jadeite Jade




glued




Element	Weight %
TiO ₂	0.0008 %
VO ₂	0.00046 %
Cr ₂ O ₃	0.00216 %
BaF ₂	0.02718 %
Fe ₂ O ₃	0.0338 %


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Disclosure and wording
Emerald



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Disclosure and wording
Emerald

1) Emeralds with no fissures (very rare):

No indications of clarity modification at the time of testing
No fissures observed in this emerald


2) Emeralds with fissures, but without any clarity modification by a fissure filling:

No indications of clarity modification in fissures at the time of testing.

This is to express that this emerald contains **fissures**, which should be **eye-visible** even to an untrained observer. Any such emerald may be refilled at any time after we have issued the report. We therefore strongly urge our clients to have such emeralds rechecked before buying the gemstone, especially if the report is not a very recent one and if the emerald looks very clean without any visible fissures.


3) Emeralds with fissures containing a filler substance for clarity modification:

Indications of clarity modification
Minor (or moderate, significant) amount of oil (or artificial resin etc.) in fissures at the time of testing.



Cleaned and then refilled emerald

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Rare collector stones

Grandidierite



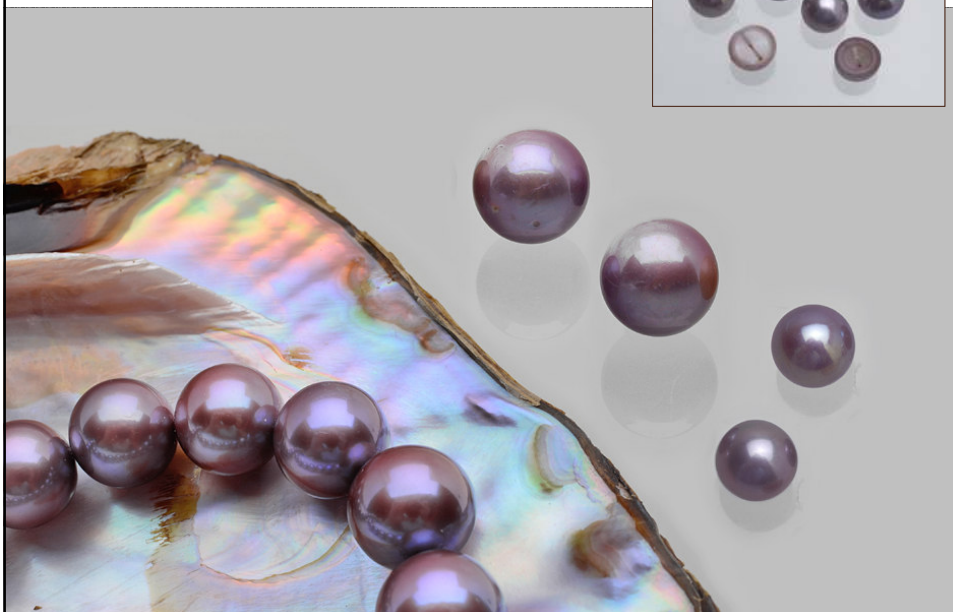
Alfred Grandidier
1836 - 1921



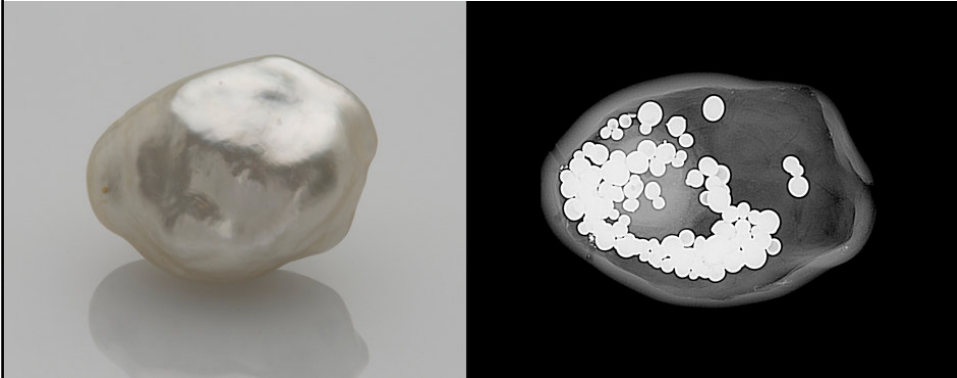
Grandidierite, a magnesium aluminium borosilicate, is a very rare collector mineral which was first discovered in 1902 by Alfred Lacroix in southern Madagascar and named in honour of Alfred Grandidier (1836-1912), French explorer who studied extensively the natural history of Madagascar.

New Beaded Freshwater Cultured Pearls from China

"Mini Ming" Pearls

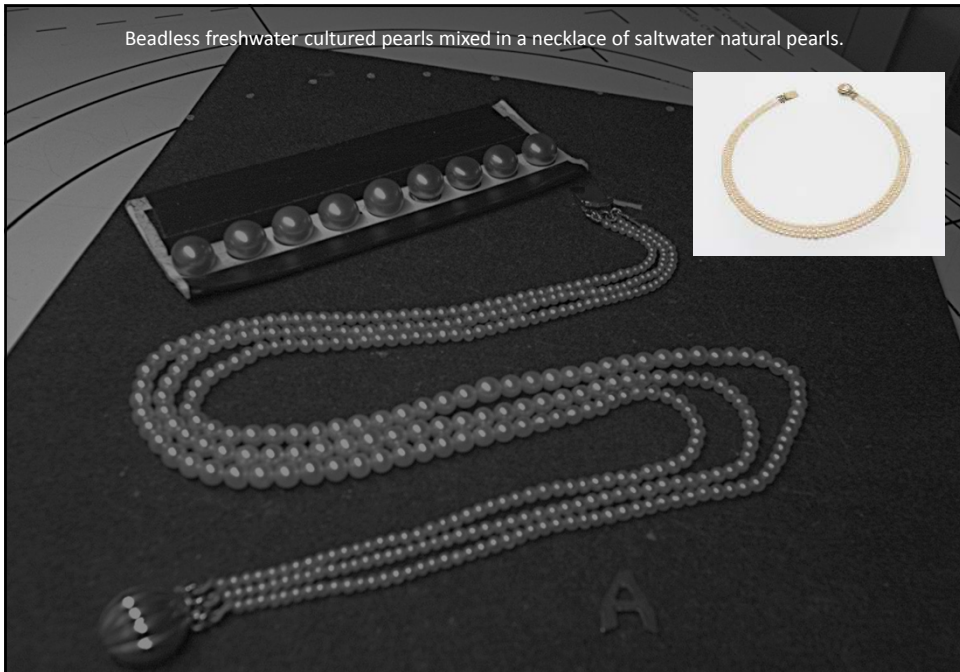


Surprise Surprise....

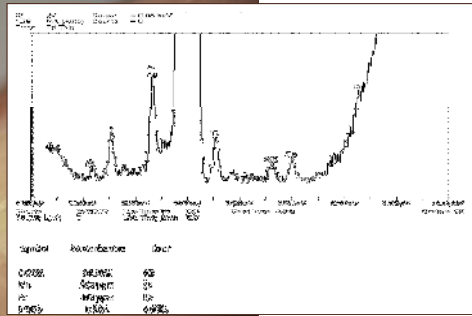
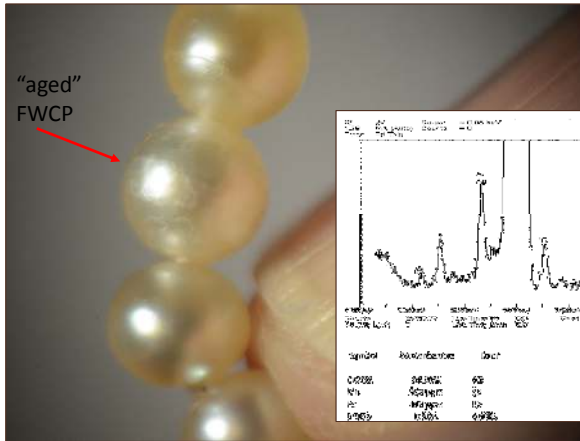


Hollow natural pearl with numerous metallic beads inside.

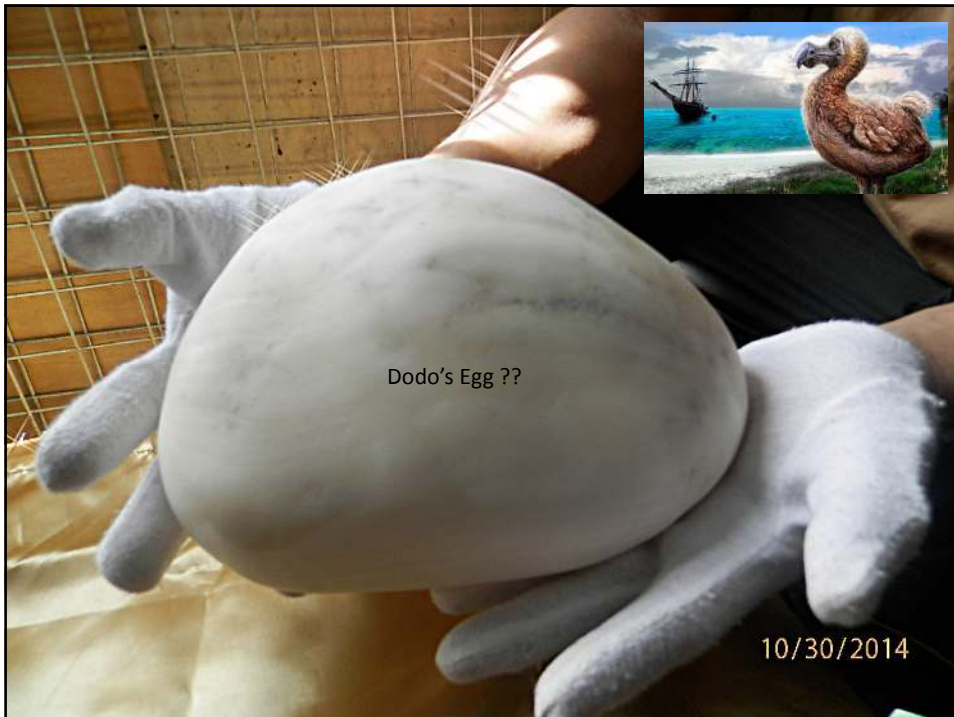
Beadless freshwater cultured pearls mixed in a necklace of saltwater natural pearls.



The Art of Forgeries
"Aged" Cultured Pearls



To better hide the FWCPs, they were "aged" by a processing.



Tridacna
Fake Pearls

CCDCNEWS | Technology & Science
Giant 34-kilogram pearl found by fisherman breaks records
The world's largest pearl, a 34-kilogram pearl, was found by a fisherman in the Philippines.

Gemological Blog
Fake Pearls Made from Tridacna gigas Shells
Michael S. Kopylovski and Laurent E. Carlier

From microscopic beads that are made from Tridacna gigas shells, pearls were made for the market. The characteristics of these pearls are different from those of natural pearls, but because they have been manufactured from Tridacna gigas shells, they are considered pearls. The pearls are made from the shells of Tridacna gigas, a species of clam that lives in the deep sea. The pearls are made from the shells of Tridacna gigas, a species of clam that lives in the deep sea. The pearls are made from the shells of Tridacna gigas, a species of clam that lives in the deep sea.




To better hide the FWCPs, they were "aged" by a processing.

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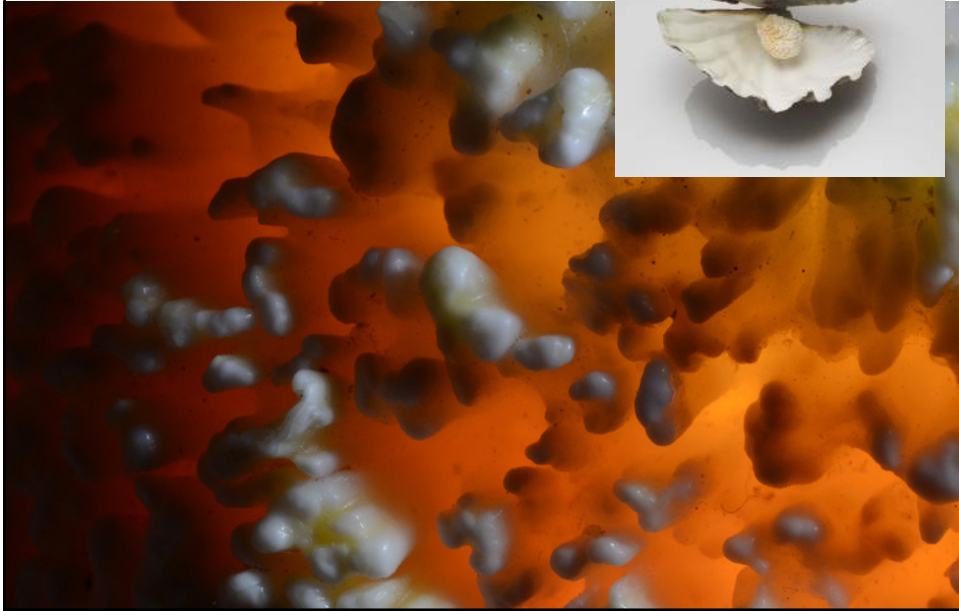


The Art of Forgeries
Fake Pearl cut from a Shell



Tridacna

Natural Blister Concretion





Lightning Ridge (New South Wales in Australia)
Opalised Dinosaur Vertebra

© Raquel Alonso-Perez, Harvard University

We assume that it was a distal member of the caudal vertebrae of a large dinosaur, such as the theropods, a saurischian suborder, which comprises the largest land-living carnivores such as the *Tyrannosaurus rex* (see also Warren 1999).

Neural arches

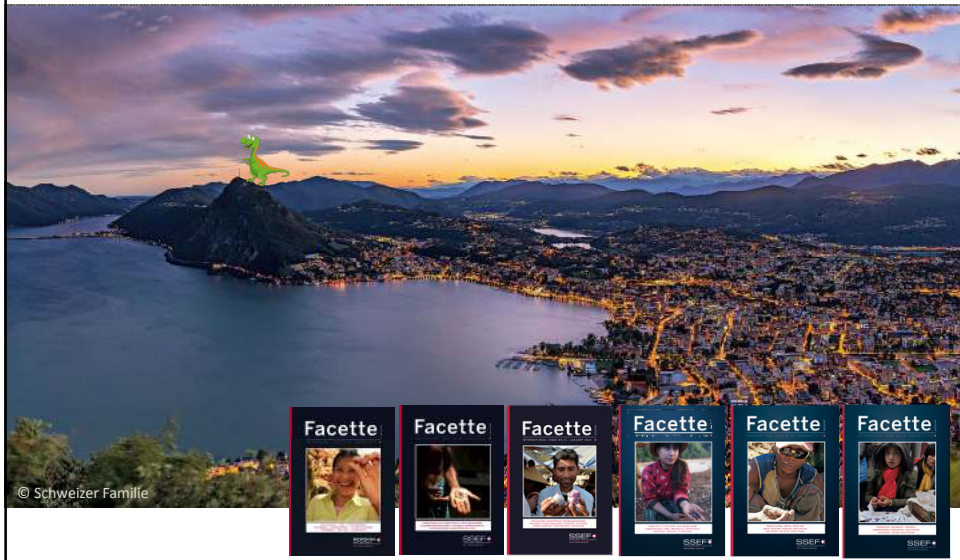
2. Axial neural arch 4. Cervical vertebrae Anterior dorsal 6. Middle-posterior dorsal 7. Sacral 9. Caudal vertebrae Proximal 11. Middle 12. Distal 13.

1. Atlantals neural arch 3. Axial centrum 5. 8. 10. Centra

Figure © Benson *et al.* 2011

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Thank you for your attention



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