SSEF FACETTE

SWISS GEMMOLOGICAL INSTITUTE
SCHWEIZERISCHES GEMMOLOGISCHES INSTITUT
INSTITUT SUISSE DE GEMMOLOGIE

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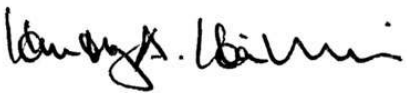
Editorial:

Dear Reader,

The last year passed without a silver line at the horizon, business was still difficult. We did have some success looking for profitable niches, especially with our extended offer of courses. As the better one succeeds in hard times, it is your chance now to follow the example of the big ones (Chopard, Cartier etc.) in receiving a thorough education.
A less positive experience was, however, that in spite of our best abilities in research, the offers we can give are hardly being used. SSEF was the first (and still one of very few) laboratory which identifies HPHT treated diamonds. But nobody wants to know. SSEF is among the first who are able to detect beryllium diffusion in corundum, but the offer is not used. Is the problem that the position of the lab is far away from the major gemstone markets? Now we will try to find the demand for our services there, in order to separate the wheat from the chaff with our new method.
An absolute highlight for me as pearl researcher was the visit of a pearl farm in the Tuamotu Atoll in Tahiti. Thanks to the invitation of Mrs. Dora Fourcade, Director of Pacific Perles I had the chance, to directly follow numerous situations in the production of cultured pearls. This knowledge is of profit to the SSEF pearl research, the SSEF pearl courses, and the SGG Swiss Gemmological Society, and therefore the whole jewellery trade of Switzerland. The identification of cultured pearls (saltwater or freshwater, with or without bead, natural colour or treated colour) is becoming an increasingly important task. Although the tariffs for pearl certificates have been the same for over 10 years now, we have to perform more and more work-intensive analyses to reach a conclusive result. New techniques have to be found, and new instruments are necessary. Being the laboratory of the Swiss jewellery trade we are not left alone when we need financial support from the trade. It is only through this support that we can guarantee for the genuine, the rare and the precious. We wish you not only a silver line at the horizon, but a platinum one. Good luck in 2004.



Prof.Dr. H.A.Hänni, Director of SSEF

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Did you already know that....

The SSEF membership fee is due on February 28, and a reduction of approx. 30% on the normal tariff list is granted to registered members only?

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in Focus:

Magic and Science of Pearls

How natural and cultured pearls are formed and how they are detected in the

Pearls are among the most beautiful adornments of jewellery. They are considered as organic gemstones. While other gemstones usually are minerals, deriving of inorganic nature, pearls are created by animals, either accidentally or by a voluntary intervention of man. Speaking of pearls we have to respect some simple nomenclature rules. These rules apply terms which define clearly the nature of pearls. The three major terms are: natural pearls, cultured pearls and imitations. The latter are produced industrially of any material which gives finally the superficial appearance of pearls. They consist of a round bead and a lacquer with a pearly lustre.

Natural pearls are formed accidentally by wild shells without any intervention of man. Natural pearls are extremely rare compared to the cultured or imitated pearls. Natural pearls may grow in saltwater or freshwater shells. Approximately 15 different species of saltwater oysters and approximately 20 species of freshwater shells were found to produce nacreous concretions, i.e. pearls. The pearls consist of mainly calcium carbonate $CaCO_3$ and a small amount of organic material (conchyoline, framework proteine). The central part of natural pearls consists often of columnar calcite which is overlaid by a nacreous layer. Its pearly sheen or orient is due to light scattering and interference on a parallel array of microscopic tablets of aragonite $CaCO_3$. The aragonite tablets are disposed like tiles in concentric layers and have a thickness of about 500 nm. A daily deposition rate of 15 to 20 layers seems a reasonable figure for most of the pearl producing shells. The nacreous aragonite is also called mother of pearl and in a round pearl it is deposited in a concentric array. This substance is secreted by a thin skin or mantle epithelium that lines the interior of the shell. The epithelium has in fact also produced the whole nacreous part of the shell. Its speciality and only capability is the secretion of substances that reinforce the shell. The outer mantle epithelium is also the key for the production of cultured pearls. Damaging the mantle epithelium at the outer rim of the shell where it is thin and fragile, may lead to a natural pearl. Crabs, parasites and other enemies which attack the shell may wound the epithelium, and disconnect some cells from the tissue. Embedded in the mantle, these cells may survive and form a small pocket in which they secrete their product: calcium carbonate. The pocket is called pearl sack, and grows with time, as does the shell itself. After a couple of years, a pearl may have formed and the shell be found by a pearl fisher.

Among the pearl producing shells there are species with different colours of nacre. These colours are reflected in the colour of the produced pearl. We encounter thus white, crème, golden, rosé, grey and black pearls. A natural pearl of a certain size, e.g. 100 ct must be considered historically important, as the Hope Pearl (454 ct). The shape of a pearl is not always round and may be described as button, drop or baroque. When a pearl is accidentally attached to the shell it may be cut away and the back be worked in order to get a usable shape. Such pearls are then called blister pearls. Very small pearls such as 2 mm or less in diameter are called seed pearls. The weight of natural pearls is often given in grains or carats, 4 grains is 1 ct (200 mg). A major difficulty in assembling a strand of natural pearls for a necklace is to find enough matching pearls. They have to match in size, shape, colour, surface and lustre. A huge number is necessary to get a satisfying match. Today natural pearls are still fished and may come from the Persian Gulf, the Gulf of Mannar, or Central America. They are extremely rare compared to the number of cultured pearls produced in numerous farms worldwide.

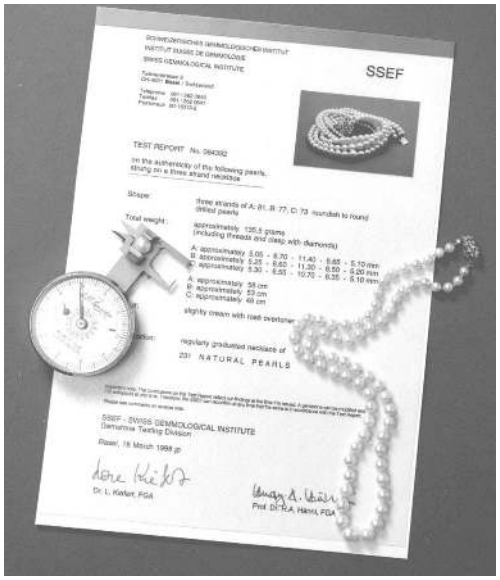
Cultured pearls with round shape exist since approximately 100 years. The earlier products consisted in overgrowths on pre-shaped bodies slid under the mantle along the shell. Japanese pioneers have understood that the nacre is produced by the outer mantle epithelium, and that this tissue alone may enable a success in cultivation of pearl. A graft (small piece of outer mantle tissue) is thus taken from a sacrificed oyster, and transplanted to another oyster. This procedure is valid for freshwater and for saltwater shells.

Pinctada magnitifera with Tahiti cultured pearls

SSEF Swiss Gemmological Institute

There are two options for the creation of cultured pearls. The tissue transplant is placed either into the mantle of "foster mother" oyster, or into the gonad tissue. The transplanted graft can be transplanted alone (beadless) or together with a round bead (bead nucleated). Traditionally salt water oysters are grafted together with a spherical nacre bead, which is placed by a surgery operation into the gonads. This organ has no capacity of nacre formation and it is thus crucial to place the mantle epithelium. The tissue transplant grows around the bead surface, forming a pearl sack. Its inner surface starts to cover the bead with nacre. The classical Japanese Akoya shell (Pinctada martensii) yields beaded cultured pearls after less than a year. For large South Sea cultured pearls the bead is exposed for a longer growth period, and the large oysters (Pinctada maxima) may accept larger beads. It is also common to use an oyster again after a harvest of the first cultured pearl. The pearl sack is carefully opened for collecting the product. Then a new bead of the size of the pearl sack is introduced. While the shell itself has also grown considerably (Pinctada maxima may easily have 20 cm across) it is able to incorporate larger beads and produce larger cultured pearls. Typically South Sea cultured pearls are from 10 to 18 mm in diameters. The Tahitian oyster Pinctada margaritifera, is a dark pigmented shell which produces nacre from dark brown to silver grey. The shell is also used to produce bead cultured pearls. This oyster is up to 15 cm across and produces pearls from usually 8 - 16 mm. Like the P. maxima, the Tahitian oyster is beaded more than once, with a progressive size of beads. And, as with P. maxima, a bead may accidentally fall out of the pearl sack, but the surface would still continue to precipitate calcium carbonate. Since the pearl sack is not full but collapsed, the new filling would have a very irregular or baroque shape. The missing bead in the new cultured pearl makes the formation uncommon in shape. The common term used to describe such formations is Keshi cultured pearl, but "beadless cultured pearl" is more correct.

Beadless cultured pearls are usually produced by freshwater shells. The Japanese Biwa cultured pearls are early products of this kind. As a rule more than 10 grafts of mantle tissue are inserted into incisions cut into the mantle areas on both shell halves. The result is over 20 cultured pearls per mussel after a period of a couple of months. Today the Chinese pearl farmers have brought the product of beadless cultured pearls to bloom. Starting with tiny rice grain shapes many years ago, the beadless cultured pearls of today may be white, almost round and over 12 mm. The most up-to-date method in Chinese freshwater cultivation of beadless cultured pearls involved a growth period of over 5 years. It is characteristic for most of the freshwater cultured pearls to be white or to have natural pastel colours such as aubergine, rose or orangey. After the harvest of the pearls a cleaning and processing procedure is necessary which sometimes extends to bleaching, surface enhancement and sometimes dyeing.


SSEF

TEST REPORT

SSEF - SWISS GEMMOLOGICAL INSTITUTE

SSEF Test report issued for pearls

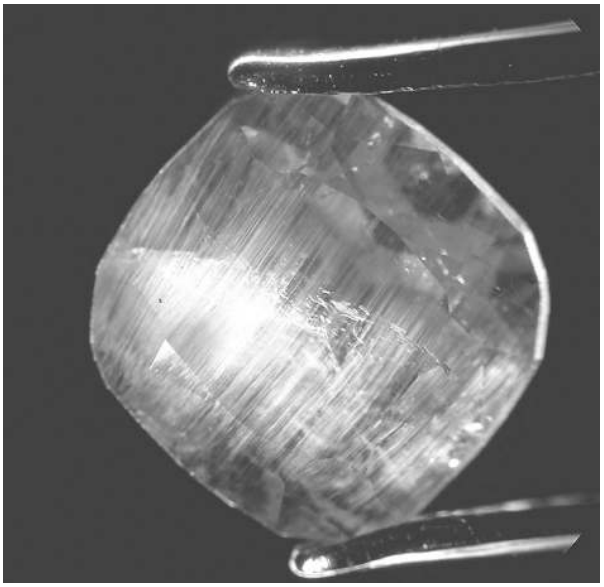
The identification of pearls is safely done by X-ray testing methods, using mainly the direct radiography method. An x-ray shadow picture is produced on a fine-grained film, and the internal structures are then studied with magnification. The main task in pearl testing is to identify the pearls as natural or cultured. Scientific methods and a highly educated staff guarantee safe results and ensure the trade with valuable pearls. Research on pearls and nacre was necessary to understand the phenomena and characteristics encountered. Conclusions of our research have been published in scientific and gemmological journals. A further field of testing coloured pearls is the authenticity of colour, i.e. identification of a possible treatment. Only by using sophisticated instruments pearl testing can be performed to the necessary liability, and the analytical equipment involves UV-VIS-NIR spectrometry, Raman spectrometry, and X-ray fluorescence spectrometry. We consider it as a privilege to work in an important gemmological laboratory and have access to rare and exceptional jewellery pieces. It is this situation which provides the gemmologists with unusual experience. Visiting pearl farms and diving to the wild oysters in various oceans also contributes to the detailed picture that enables us to understand the pearls in all their variations.
Should you like to know more about the fascinating topic "Pearls" then you must get our Pearl-CD, or better enrol for a one-day pearl course!

This article is reproduced from a publication of Prof. H.A. Hänni in: Magnificent Jewels. Catalogue of the November 19, 2002 Geneva Auction, Phillips de Pury & Luxembourg, page107-108.

Gemmology:

Pezzottaite, a new mineral and gemstone

SSEF investigated material from Afghanistan and Madagascar



Pezzottaite with parallel oriented inclusions

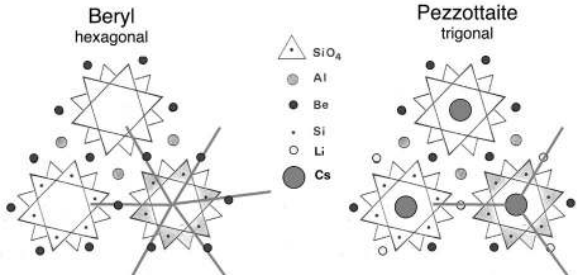
In the course of 2001, the SSEF received a pink crystal specimen by Mr Haleem Khan (Hindu Kush Minerals, Peshawar, Pakistan), which reportedly had been found at the Deva mine, Paroon valley in Afghanistan. By the end of 2002 much larger quantities of similar looking crystals were brought to the market , originating from a pegmatite in Mandrosonoro, approx. 150 km SW of Antsirabe (Central Madagascar). First regarded as a new variety of beryl it was sold as "rasperry beryl" or "raspberyl". SSEF received several rough and cut samples from Denis Gravier (France), Alexander Leuenberger (Switzerland), and Werner Spaltenstein (Chantaburi, Thailand).

Investigated pezzottaite from Madagascar and Afghanistan

The crystals display a tabular, hexagonal shape and usually contain plenty of oriented inclusions. These stones may show a distinct cats-eye effect if cut as a cabochon.

Shortly after the discovery of this new material SSEF began to investigate it, as did other gemmologists and mineralogists. Apart from its somehow external similarity to beryl, the material showed very striking values for refractive indices (RI 1.608 - 1.615) and specific gravity (SG 3.10), which were distinctly higher than any values reported so far for beryl. Due to these values, the new material could be mistaken as a pink tourmaline (although tourmaline has a higher birefringence). The true nature of the pink gemstones as a new member of the beryl group was shown by chemical and structural analyses at SSEF and several specialized institutes at University of Basel (kindly supported by Mr. M. Neuburger and Dr. S. Schaffner, Prof. S. Graeser) and ETH Zurich (Dr. T. Pettke).

These analyses revealed that large amounts of cesium and lithium are replacing part of the beryllium in the crystal structure of common beryl, giving rise to a trigonal symmetry.



Comparison of beryl and pezzottaite structure
© M.S. Krzemnicki

The high atomic mass of cesium is the reason for the high values of SG and RI in this material. Based on these results, it became obvious that these stones belong to a new mineral species of the beryl group: Pezzotatite $Cs(Be_2,Li)\ Al_2\ (SiO_3)_6\ H_2O$ (trigonal)

In autumn 2003 the ICNM (International Commission on New Minerals and Mineral Names) approved the new mineral as **pezzottaite,** proposed by another research team from Canada, USA, and Switzerland. The name is in honour of mineralogist Dr. Federico Pezzotta who is investigating pegmatite deposits in Madagascar for years.

P e z z o t t a i t e c o m p a r e d w i t h b e r y l

Mineral (origin)	Density (g/cm^3)	Refractive indices (n_e)	(n_o)	birefringence (‰)	Cs_2O (wt%)
Pezzottaite (Madagascar)	3.089-3.103	1.604-1.608	1.611-1.615	- 0.007	14.27-14.63
Pezzottaite (Afghanistan)	2.906	1.598	1.606	- 0.008	9.70
Beryl, Morganite (Madagascar)	2.760	1.592	1.600	- 0.008	1.09
Red Beryl (WahWah, Utah)	2.670	1.565	1.570	- 0.006	0.13

Current research:

CVD synthetic diamonds

These last months, single-crystalline synthetic diamonds produced by the so called Chemical Vapor Deposition method (CVD) were highlighted by various media (press, television, etc.). Although CVD synthetic diamonds are known since the sixties, large single crystals are surely a new product.
Taking profit of his participation at the SSEF Scientific Gemmological Course, Dusan Simic (from EGL USA, New York) lent us five CVD synthetic diamonds for a short time. Collaborating with other gemmological laboratories, Branko Deljanin (Director of the Gem Identification and Research Department at EGL, Vancouver) who got these samples from the Apollo Diamonds Company shared his research work for an upcoming common publication.

One of the CVD synthetic diamonds from Apollo Diamonds Company, USA, tested at SSEF Swiss Gemmological Institute

The samples analysed at the SSEF were not particularly difficult to distinguish from natural diamonds. Scientific and gemmological data on CVD diamonds will soon be published.

HPHT treatment of diamonds

SSEF seriously considers the developments with HPHT treatment. We closely watch this treatment either when it applies on natural or synthetic diamonds. We know that HPHT treatment was noticeably improved in order to reduce the time of treatment and consequently to make it more profitable. Other developments were made especially in order to increase the number of treatable diamonds.
One remembers that when it applies to type II diamonds, the HPHT treatment may modify the original brown colour to colourless, pink or blue. One also remembers that some type IaB diamonds become colourless after an HPHT treatment. And finally, we should not forget that when HPHT is applied to type IaAB brown diamonds this treatment makes them greenish-yellow, orange, yellow, brownish-yellow, etc.

We recently read in a Patent Application of the "General Electric Company" dated July 2003, that a brown diamond of type IaAB was transformed into a colourless diamond after HPHT treatment. Background and consequences of this announcement have to be carefully examined. We know that most diamonds on the market are of this type are of type IaAB (Cape Series) But not all of them will turn colourless. This is due to two reasons. The first one is that not all stones of this type contain the same quantity of nitrogen and the second is that the distribution of nitrogen aggregates is not the same in all diamonds. Another possible reason could be linked to the causes of the original brown colour of these diamonds.
It is therefore reasonable to say that brown diamonds of type IaAB becoming colourless after an HPHT treatment may contain a low nitrogen concentration and a particular aggregate ratio A/B. This fact greatly limits the quantity of type IaAB diamonds that will turn colourless after such a treatment.

New sapphires from Sri Lanka: diffusion treated or not?

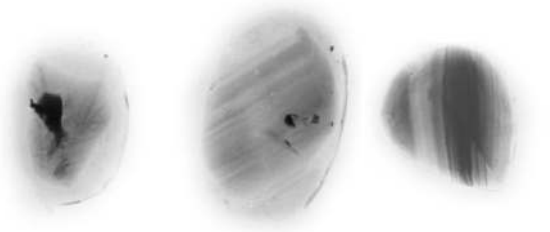
The Problem:
Recently the SSEF received four sapphires from 4.56 to 11.11 ct from Sri Lanka. The stones were rather free of inclusions and showed a medium strong saturated blue colour. One sample displayed a distinct blue colour zone, whereby all others showed a rather uniform colour distribution with common illumination.

Four investigated sapphires which show a bright rim

Under the microscope they showed features indicating a heat treatment. However, when examining in an immersion cell, these sapphires showed partially strange uneven colourless rims of about 1mm thickness. Surprisingly the colourless zones do not follow completely the outline of the cut stones. Similar observations had already been communicated recently by Ken Scarratt (AGTA Gemlab, New York, 18 July 2003) and created some controversy about the reason for this feature. Is it due to a diffusion process, involving chemical elements which are intruding the sapphire from outside during the heat treatment? This could have a further major negative impact on the market of corundum similar to the introduction of beryllium diffusion treated corundum in 2001 and 2002 (see Hänni, in Jewellery News Asia, Dec. 2002).
So far no final result has been produced, whether this zoning is due to a diffusion process or not, but investigations from several gemmological laboratories are under way, using highly sophisticated analytical methods (e.g., SIMS, LA-ICP-MS). SSEF has also been asked by the National Gem & Jewellery Authority of Sri Lanka to carry out a detailed investigation on this treatment in order to help them to protect the reputation of the Sri Lankan gem industry.

A solution:
The analyses carried out at SSEF involved all classical as well as sophisticated tests. There was no foreign element found with elemental analysis (LA ICPMS).

We were informed from the National Gem & Jewellery Authority of Sri Lanka that electrical furnaces with protective gas were used for the heating of the stones which proceeds usually at 1800 ^{0}C. As known since long (see e.g. Nassau 1982) a reducing atmosphere is necessary to develop blue in Geuda sapphire. The reductive atmosphere in a furnace is provided by either burning fuel, a process that removes free oxygen. A second way to have a reductive, i.e. oxygen-free atmosphere, is to flood the furnace with a neutral gas (e.g. nitrogen). The main reason for the blue colour in Sri Lankan heated sapphires is the charge transfer band of Fe^{2+}/Ti^{4+}. In oxidising atmosphere blue colour is rather diminishing, Fe^{2+} changes to Fe^{3+} and the Fe/Ti charge transfer is destroyed. We can now imagine a similar process of oxidation at the end of the treatment of the blue sapphires with colourless rim. We think that towards the end of the heating process the pump for protective gas is stopped and some air (containing oxygen) enters the furnace. A wave of oxydation may just affect the surface and decolorise a surface related layer of the stone: colour fading occurs in the last phase of the treatment.



Three sapphires showing bright rim.
Left and middle: heated sapphires with colourless rim, recently investigated by SSEF.
Right: traditionnally heat treated sapphire showing natural zonation and the typical decrease of colour towards the girdle. Picture in dijodomethane immersion. Photo H.A.Hänni © SSEF Swiss Gemmological Institute 2003

Now at the latest it becomes clear that the disputed heat treatment must be performed on uncut stones which is mostly the case. Many rough sapphires are first heated and then cut in order to take profit from a good orientation of the shape. Should these heated rough stones produce a colourless margin, it would partly be removed during shaping and polishing. In our present case we are thus dealing with sapphires which keep parts of surface related fading zones. Once this message will reach the Sri Lankan heaters we suspect that they may change slightly their way of operation in respect of protecting the sapphires to the very end of the treatment and avoid the de-colorisation of surface related zones.

We can make surprising observations when looking at page 68 of "SSEF Standards & Application", a reference book which was printed in 1998. We find pictures of heated sapphires taken in 1983. The three stones which were heated but not diffusion treated show a very similar colourless margin which is merging with colourless parts of the stone. It is clear, as seen with synthetic blue sapphires, that the colour gets less when it comes to the girdle area. Natural irregularities in colour distribution may interfere with this effect and create the "unusual colour distribution" (GIA Insider, Dec. 12, 2003, Breaking News from GIA Research). Again comparing with literature (Gems & Gemology Summer 1990, p. 127) we consider the effect less new and less intriguing. The "new" effect which created some uproar may be considered as a accumulation of three effects which are :

a)The colour decreases towards the girdle
(thickness effect)
b)The colour may be inhomogeneous
(growth effect)
c)The colour may fade along the surface
(treatment effect)

In the light of the above explanation SSEF will describe such stones as heated when it comes to a test report. We do not see evidence of diffusion of a foreign element as in the case of the beryllium treated orange and yellow sapphires.

Tahiti black pearl cultivation

In September, Prof. Hänni made a trip to Papeete in order to visit GIE Perles de Tahiti. After having seen pearl cultivations in China and Australia it was necessary to get first hand information from the central pacific as well. Introduced by Marianne Buchs, Prof. Hänni had a very warm welcome at Perles de Tahiti headquarters. Gerald Adams did every thing to satisfy the high expectations. The quality control office was shown, where nacre thickness is tested before exportation. A remarkable trip was made to visit a pearling farm on Aratika (Tuamotu). It was enabled by Mrs Dora Fourcade of Pacific Perles, who invited Prof Hänni to her modern and well-maintained establishment. All steps from elevation over operation to harvesting could be studied.

Quality control of Tahiti cultured pearls in Papeete

At depth discussions about epithelium transplant and shape development might even end up in a joined research project. Very satisfied and with a lot of interesting impressions Prof. Hänni continued his trip to Hong Kong, where an important part of the Tahitian production was sold in the Robert Wan auction.

Gemmological Courses:

Course program 2004

As in previous years, SSEF offers again a rich blend of gemmological courses for all tastes (see attached SSEF course program 2004). Especially for the jewellery- and watch-making industry, we offer a course on quality assessment of small diamonds, i.e. how to define and control quality criteria for large quantities of small diamonds. Please contact SSEF for detailed information (gemlab@ssef.ch)

Excursion to Djeva SA, producer of synthetic stones

On the **6th April 2004**, SSEF offers you an exciting trip to **Djeva SA Industries** in Monthey (Valais, Switzerland), who produce synthetic stones in large quantities for the industry. You will get a close insight in the production of Verneuil-synthetic corundum and spinel. For years this visit has always been a "highlight" for students in mineralogy of University Basel. In this context, we would like to thank Dr. Katia Djevahirdjian and her staff for their generosity to welcome us in their company during the past years. Now, SSEF also offers this exciting trip to the participants of our gemmological courses. For detailed information, please contact SSEF (gemlab@ssef.ch or +41-61-262 06 40).

Chopard Diamond Course

SSEF education has gained a high reputation in the last few years, which is expressed by the participation of leading auction houses and jewellery and watch making companies in our courses. In collaboration with Chopard SA and Mr. E. Galusero (CeME Lausanne) we have achieved a six-month course program on diamond, providing basic knowledge of product to the sales representatives of all Chopard boutiques worldwide.
To communicate professionally about gemstones is a key to success for the promotion of jewellery and watch brands. To establish a uniform and correct use of terms of all sales representatives of an international operating brand is an important step towards credibility for the customer. As one of the internationally leading laboratories, the SSEF Swiss Gemmological Institute has always seen a vital interest in offering highly professional gemmological formation programs to the trade. In supporting the ambitious diamond education project of Chopard SA, the SSEF Swiss Gemmological Institute has taken a futher step forward to become a leading authority for highly specialised gemmological formation programs. Compare our courses with other gemmological programs. We are sure that SSEF Swiss Gemmological Institute will be your favourite choice if you are interested in a highly reputed and up-to-date education in gemmology.
Please contact us, if you would like to get more information about a gemmological formation for your staff: gemlab@ssef.ch

Congratulations to new SSEF Basic Gemmologists

In 2003 all SSEF Basic Training Courses had to be offered twice, because so many applicants wanted to take part in this gemmological education programme. Only candidates who have fulfilled SSEF standards of gemmological knowledge and practical testing during a final examination receive the SSEF Basic Gemmologist Certificate. 2003 was especially successful, as more candidates than ever passed this final examination successfully.
We would like to congratulate the following participants for their SSEF Basic Gemmologist Certificate:
Mrs. Evelyne Akribas, Belmont - sur - Lausanne
Mrs. Nicole Broglie, Bonstetten (Switzerland)
Mrs. Biljana Colovic, Basel (Switzerland)
Mr. Kembo Difima, Einsiedeln (Switzerland)
Mrs. Eveline Frischknecht, St. Gallen (Switzerland)
Mr. Jürg Hiltmann, Uitikon - Waldegg (Switzerland)
Mrs. Brigitte Hodler, Heimberg (Switzerland)
Mr. Andreas Jordi, Kirchberg (Switzerland)
Mrs. Olivia Lanfranchi, Lengnau (Switzerland)
Mr. Reinhard Strickler, Boswil (Switzerland)
Mrs. Vidhya Y. Ullal, Mumbai (India)
Mrs. Paula J. Vance, Basel (Switzerland)
Mr. Nicolas Youssoufian, Geneva (Switzerland)

Scientific and special courses

In 2003 we gave three Scientific Gemmology Courses, more than ever since we offer this course seven years ago. These highly specialized courses are offered for experienced gemmologists who want to get a close insight into scientific methods for gemstone testing. The following participants received an SSEF Scientific Gemmologist Certificate in 2003

Adrian Meister from Zurich, Switzerland
Hyun Min Choi, Hanmi Gemological Institute, Korea
Wu Chao-Ming, Taiwan R.O.C.,
Ryan Petrozello, Tiffany & Co., Parsipanny, NJ (USA)
Laura Wohland, Tiffany & Co., Parsipanny, NJ (USA)
Anwar Abdulaziz Hasan, Metalgem, Bahrain
Dusan Simic (EGL USA, New York)
Alessandro Proposito, Agenzia delle Dogane, Rome

Mr. Meister and Mr.Hyun Min-Choi at the XRF during the SSEF Scientific Gemmology Course in January 2003

Mrs. Wohland, Mr. Hasan, Mr. Wu Chao-Ming and Mr. Petrozello together with Mr. Düggelin (at the left), operator at the SEM laboratory of the University of Basel.

Additionnally, *Mrs. Ayesha Rashed Ahmed Almazrooei, Dubai Central Laboratory* was following a special course about the application of UV-Vis-NIR spectroscopy in gemmology. For detailed information about SSEF Scientific Gemmology Courses and SSEF special courses please contact gemlab@ssef.ch

Mr. Proposito and Mr. Simic together with Prof. Hänni from SSEF with their Scientific Gemmologist Certificate

Seminar in Königstein, Germany

During two weekends, the SSEF was invited by Jeanette Fiedler of the DDI Deutsches Diamant Institute and Mrs Wanhof from the "Förderungswerk Königstein" to hold a seminar for members of the German Association of Jewellers together with the well-known Förderungswerk Königstein near Frankfurt am Main (Germany). Due to the large number of applicants, this gemmological seminar on coloured stones, diamonds and pearls was held two times at the weekends of 25./26 October 2003 and 8/9 November 2003. Prof. Hänni, Dr. Kiefert and Dr. Krzemnicki gave the introductory talks and assisted the workshop. Each course weekend was attended by more than 25 participants, which were interested to learn more about new treatments of gemstones and pearls. Based on the success of these lectures, SSEF, in collaboration with DDI, plans further seminars in Germany in the future (send an email to SSEF for more information: gemlab@ssef.ch).

Particpants of the second seminar in Königstein together with Dr. Krzemnicki and Dr. Kiefert from SSEF, Mrs. Fiedler from DDI and Mrs Wanhof from the „Förderungswerk".

News from the SSEF laboratory:

New: SSEF arrived in the European Community

Finally SSEF got it: we offer a new and easy way of shipping goods (only loose gemstones and loose pearls) from within the European Community to our laboratory:
Send your items to:

SSEF Swiss Gemmological Institute
c/o. Erwin Morlock
Friedrichstrasse 26
D-79618 Rheinfelden
Germany

By using this address, you won't spend your precious time with customs services anymore. Import and export of your items will be done entirely by SSEF and its partner in Germany. You will be charged a fee of 50.- to 80.- Swiss Francs per shipping, depending on customs charges. For details, send an email to gemlab@ssef.ch or call us at +41-61-262 06 40.

Detection of beryllium diffusion treated corundum

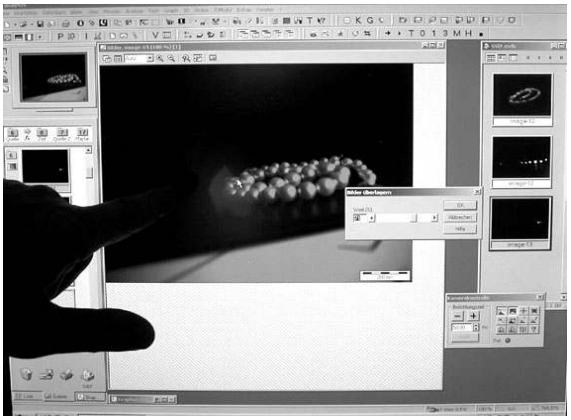
So far detection was difficult and expensive!
In 2002, the beryllium diffusion treatment on corundum hit the gem market badly. Together with other laboratories, SSEF Swiss Gemmological Institute has published a number of articles on this highly debated topic (see also Facette of last year!). But the difficulty of detecting beryllium diffusion treated stones still remains. Up to now, only expensive testing methods using mass spectrometry were successful in a safe determination of such stones.

Now SSEF starts a new era for beryllium detection!
We are lucky to inform our clients that SSEF Swiss Gemmological Institute is introducing a new and highly sensitive beryllium detection system. Due to this instrumental progress we are the foremost gemmological laboratory world-wide, which is able to

offer you a fast and safe detection of beryllium diffusion treated corundum at a very low rate. We are also prepared to handle large quantities of yellow, orange a.s.o sapphires in a very short time. We are going to offer this service not only at the SSEF laboratory in Basel, but also during our on-site gem testing in the Far East and other locations. For the promotion and demonstration of this absolutely new detection method we intend to be present in New York, Bangkok and Tokyo for on-site testing during 2004. By the new method it will be easy and affordable for you to differentiate older yellow sapphires, padparadschas and rubies from the new diffusion treated material. Please contact us for detailed information (+41-61-262 06 40 or gemlab@ssef.ch).

Golay supports SSEF research

As the characteristics to distinguish natural pearls from beadless freshwater cultured pearls and beaded saltwater cultured pearls (e.g. South Sea cultured pearls) are becoming increasingly similar, it is necessary for SSEF to have a further detection method. By using a high sensitive camera we now are able to observe the luminescence of freshwater pearls under X-rays at the same time as we take the X-ray radiograph. Mr. Fischer, Director of the pearl department at Golay has kindly sponsered such a CCD camera to the SSEF. We will profit in the future from this new method, and pearl identification even of whole strands will become much easier. At the moment we are still performing prelimiary studies about the possibilities and limitations of this new method.



X-ray luminescence of a strand of freshwater cultured pearls

Colloquium to celebrate the 60th anniversary of Prof. H.A. Hänni in 2005

In January 2005, Prof. Hänni, who is with SSEF Swiss Gemmological Institute for more than 23 years, will celebrate his 60th anniversary. On behalf of this, we will organise an international Gemmological colloquium at the Geosciences Department of the University of Basel, Switzerland. For more than three decades, Prof. Hänni has devoted his forces to the increase of gemmological knowledge, contributed to the understanding of gemstones and pearls and wrote numerous publications in all important gemmological and mineralogical journals. During that time he has achieved an outstanding reputation for gemstone testing and has become a leading figure in the international community of gemmologists.
The Gemmological Colloquium to honour Prof. Hänni will feature lectures from outstanding gemmologists and mineralogists from all over the world. We are going to invite respected speakers for the Gemmological Colloquium 2005 in order to create a great event for the profit of the gem industry and all visiting gemmologists. In forthcoming advertisements we will keep you informed.

Social event: SSEF Membership Dinner in Geneva in May 2004

Just before the jewellery auctions in May 2004, SSEF Swiss Gemmological Institute and the SSEF Swiss Foundation for Gemstone Research will invite our members to a special social event: The first SSEF Membership Dinner. Thanks to an anonymous sponsor, this event will be held on Sunday evening, 16 May, starting at 6.30 pm. We will be pleased to send all our SSEF members a personal invitation in the beginning of 2004. It is the target of this special event to strengthen the ties between the laboratory and the SSEF members and to communicate our ongoing projects, future goals and necessities to maintain the highest standard of gemstone testing for the profit of the gem trade. Furthermore, we will launch our new "SSEF research campaign" for coloured stones, diamonds and pearls. We are looking forward to welcome our esteemed SSEF members at this first SSEF Membership Dinner. If you are not yet an SSEF member and would like to attend this informative dinner, you are welcome to join the growing number of members and contact us at gemlab@ssef.ch.

SSEF in New York 2004

In February 2004, SSEF Swiss Gemmological Institute will be in New York for one week, offering on-site gem testing services at attractive rates. Our services will include testing of coloured gemstones with origin determination where feasible with our mobile equipment. You will meet us from **Monday 9th to Friday 13th Februray 2004** in the premises of:

J. & S.S. De Young Inc.,
608, 5th Avenue
Suite 708
New York, USA

To fix an appointment in advance for testing your stones, please call +41-61-262 06 40 or send an email to gemlab@ssef.ch.

J-P. Chalain finishing his CIBJO mandate

In the SSEF facet No.8, 2000 you were informed that in J-P. Chalain was elected for two years as President of the Laboratory Commission of CIBJO (The World Jewellery Confederation). In fact, an extension of his presidency was voted in Munich for two more years, but conforming to the CIBJO status, another President will be elected in May 2004 at Bangkok during the next CIBJO congress. It is therefore time to present a review of the work he has accomplished during these two mandates.

The CIBJO Registered Laboratory directory was created and distributed to all CIBJO Registered Laboratories.
A process to register laboratories with CIBJO was implemented. It is conform to all CIBJO statutes and rules. This process includes the formation of a newly formed CIBJO Registration Laboratory Commission (Registration LabCom) and a document titled "Application Form to Register a Laboratory with CIBJO (AFRL)". The LabCom is also competent to register any national duplicate of the CIBJO masterset.
The Registration LabCom welcomed five new CIBJO registered laboratories from the following countries: China, United Arab Emirates, Hong Kong (China), India and Thailand.
In order to consider the arrival of HPHT treated diamonds and synthetic diamonds, the LabCom also updated the CIBJO Diamond Grading Instruction Edition 11 for all CIBJO registered Laboratories.
Finally, J-P. Chalain wishes to thank the following persons for their valuable contributions:
Mr. Rudy Biehler, Mr. James Evans-Lombe, Mr. Christopher Smith, Mr. Heja Garcia-Guillerminet.
The following bodies are also thanked for their financial support: Mr. R. Biehler, Ernst Färber Jewellery, Munich, the Diamond Trading Company, DTC, the Chambre de Commerce de Paris, the Gübelin Gem Laboratory, the Swiss Foundation for the Research of Gemstones (SSEF).

The use of a harmonized language on certificates starts

For three years now, the SSEF Swiss Gemmological Institute has been participating at the LMHC meetings. LMHC stands for Laboratory Manual Harmonization Commission. This commission is made up of representatives of seven of the most important laboratories worldwide. Their task is to unify wordings on certificates for the benefit of the trade. This task takes up a lot of time as well as a large amount of money from the participating bodies. Members of the group are: AGTA Laboratory and GIA Gem Trade Lab (USA), Gübelin Gem Lab and SSEF Swiss Gemmological Institute (Switzerland), CISGEM (Italy), the laboratory of the Gemmological Association of All Japan (Japan), and the Gemmological Institute of Thailand. The Commission compares different wordings they use on their certificates for the same situation, analyses which methods are applied to get to the results, compares standards, and comes out with a solution that is of benefit to all members.
In November 2003, at an LMHC Meeting in New York, first results could be finalized and will be presented in an information sheet in Tucson in February 2004. The results comprise the wording for non-heat-treated corundum, heat-treated corundum, heat-treated and glass-filled rubies including a comparison of different scales for the amount of foreign substances in fissures, and diffusion-treated corundum. The reason why the harmonization of the wording for corundum test reports took 3 years lies in the fact that when the commission was about ready to release the results, a new treatment was introduced (Be-diffusion), which had to be included. At the moment, the LMHC group is working on the wording for emerald reports.
We are convinced that this harmonisation process between the labs will help the trade and the end consumer to understand test reports better and therefore to profit from better business.

Show time for SSEF:

Basel Fair 2004: Use our 24h Express Service

As in previous years, the SSEF staff was again quite busy in 2003 issuing on-site reports. Once more we had the possibilitiy to welcome many SSEF customers at our booth and to offer them a cup of coffee.
In 2004, SSEF will be found on the **ground floor of Hall 3, Booth D 28,** at the same location as last year. As every year we offer a 24h express service during the Fair. Bring your stone one day and take it again together with the certificate the next day. This certainly is a profitable situation for you because it saves you time and shipment cost. Do not miss the chance to have your important stones certified while you are in Basel.

Certificates on the row at SSEF

Meet us in 2004 for On-Site Certificates

New York	9- 13 Feb. 04
Inhorgenta Munich	20-23 Feb 04
Basel World 2004	15-22 April 04
De la Paix Show, Geneva	16-20 May 04
Hongkong Gem Fair	17-21 Sept. 04
De la Paix Show, Geneva	14-18 Nov. 04

SSEF travelling

The year 2003 was again very busy. All gemmologists were travelling around the globe to spread our name even more. Starting in **February**, Dr. Krzemnicki was at the Gem Show in Tucson to look for new gem materials such as pezzottaite and to attend the GILC meeting. At the end of the same month, Prof. Hänni and Dr. Kiefert had, for the first time, a booth at the Inhorgenta in Munich to further promote SSEF in Germany.
In **May**, Prof Hänni was invited speaker at the GemA Scottish Branch in Perth and gave a lecture about diamonds and orange sapphires. In the same month Prof. Hänni and J.-P. Chalain were in Geneva during the auctions to meet our clients there and to do on-site testing on some items for the auction. Just after that, they joined Dr. Krzemnicki at the annual meeting of the Swiss Gemmological Society in near Lugano (Switzerland), where SSEF presented talks on topaz, diamonds, and interesting cases of gem testing. In **June**, J.-P. Chalain went to Milan for the LMHC meeting about the harmonisation of corundum disclosure on lab reports. This topic was further discussed during a second meeting in New York in November 2003, which was attended by Dr. Kiefert from SSEF. A press release with the final results is planned for the Tucson Show in February 2004 (see also section above: The use of a harmonized language on certificates starts). Also in June, Prof. Hänni was giving a lecture about gemstones from Eastern Africa and Madagascar at the GIA Gem Fest during the Vicenza Trade Fair. In **July**, Dr. Kiefert was again in Munich, this time for a lecture about cultured pearls for the "Mineralienfreunde München".
In **August** and **September**, Prof. Hänni was travelling around the globe, starting with a visit at the Abalone farm in Davenport, California. Next stop was Papeete in Tahiti, where he was invited to visit GIE Perles de Tahiti headquarters. Furtheron he made a remarkable trip to a pearling farm on Aratika (Tuamotu), kindly enabled by Mrs Dora Fourcade of Pacific Perles (see section above Tahiti black pearl cultivation). Finally he arrived for the Gem Fair in Hong Kong and joined with Dr. Kiefert and Mrs. Niggli to do on-site testing during the one-week show. As in the last few years, they met a lot of friends of SSEF and had many contacs with new customers. Also in September, as a member of the organising committee Dr. Kiefert was in Gent (Belgium) for the Archaeoraman Congress, where she presented Raman data on so-called „rainbow-calsilica" and research data of Dr. Krzemnicki on the Raman peakshift when comparing pezzotaite with beryl.
In **October** and **November**, SSEF was invited by Mrs. Fiedler from the DDI (Deutsches Diamant Institut in Pforzheim) to give lectures about new developments in gemstone treatments. These two-days courses were held on two weekends in Königstein near Frankfurt a.M. by Prof. Hänni, Dr. Kiefert, and Dr. Krzemnicki.
In November, Prof. Hänni was invited guest-speaker for the GemA annual meeting in London: He presented interesting cases of gemstone testing in 2003 including pezzottaite, type IIa diamonds, a Sc-bearing mineral of the milarite group, pearl testing and glass identification. Also in November, SSEF was again present with a booth at the De la Paix Jewellery Show during the Geneva auctions.

Close up: The SSEF Foundation Board

The Swiss Foundation for Gemstone Research SSEF (**S**chweizerische **S**tiftung für **E**delstein-**F**orschung) was founded (according to art. 80ff ZGB Switzerland) on 22nd August 1972 by the „Union de la Bijouterie et Orfèvrerie Suisse UBOS".

The seven members of the board are responsible for the purpose of the foundation, i.e.:

- To establish an independent Swiss gemmological laboratory and to maintain the financial basis for its operation
- To ensure the continuous scientific research on gemstones, pearls and other materials
- To promote the formation of professionals in the gemstone sector by qualified teachers

The members of the SSEF Foundation Board meet at least four times a year to discuss all current topics together with Prof. Dr. H.A. Hänni, director of the laboratory. During the last few years and months, the board was mainly engaged in funding and lobbying

nationally and internationally, to maintain the financial basis for the laboratory. In past and present, its prior activities are to promote and further develop the laboratory by the aquisition of highly sophisticated instruments for gemstone testing. The honorary members of the foundation board are devoted to further promote the position of SSEF as one of the leading gemmological authorities worldwide . In such a way they are also acting as SSEF „ambassadors“ in their trade sector.
At the moment, the members of the SSEF Foundation Board are (starting from the top of the stairs):

- Marc Christen, attorney (Berne, Switzerland): President of the foundation board and president of UBOS
- Charles Abouchar, gemstone trader (Geneva, Switzerland): Vice-president of VSE
- Ronny Totah, gemstone trader (Geneva, Switzerland): Member of VSE
- Adrian Meister, Retailer (Zurich, Switzerland): Former president of the Swiss Gemmologiscal Association SSG and member of the committee of the Swiss Association of Goldsmiths and Watchstores VSGU
- Thomas Frieden, jewellery manufacturer (Thun, Switzerland): Member of the committeeof the Swiss Association jewellery manufacturer and precious metal supplier VSSEL, and member of VSGU
- Daniel Gallopin, jeweller (Geneva, Switzerland): Former president of the SGG and member of VSGU
- Hanspeter Husistein, gemstone trader (Geneva, Switzerland): President of the Swiss association of gemstone traders (VSE)

The foundation board would like to thank all clients, members of SSEF, and the members of the associations connected with UBOS for their long-standing loyality and support. The members of the board hope that this mutual cooperation will further strengthen in future, as the gemstone trade in Switzerland can not do anymore without the SSEF.

SSEF publications in 2003

In 2003 SSEF has published in all major gemmological journals and trade magazines. Among these were publications on the new mineral pezzottaite (formerly described as pink morganite), yellowish green HPHT synthetic diamond , so-called „rainbow calsilica„ and non-potential emerald from Binntal/Switzerland. SSEF gemmologists further contributed to publications on very rare gemstones such as poudrettite and grandidierite, amber, and gem materials in antique jewellery. Additionally SSEF published a number of short gem news about „rainbow-calsilica“, spinel, coated topaz, tatami strain in diamonds, star sunstone from Tanzania, and star quartz.
Separate reprints of articles are available on request by e-mail gemlab@ssef.ch . Abstracts are presented on www.ssef.ch/en/news/publications.html.

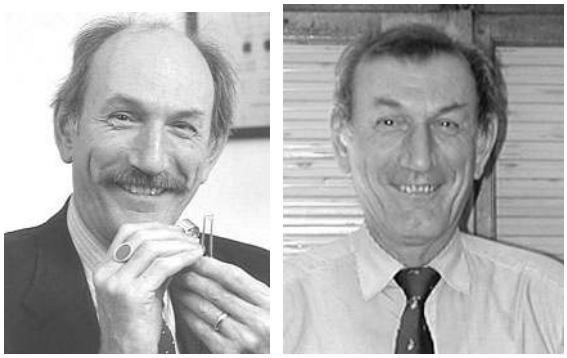
Thanks to donors

Thomas Färber for unheated ruby from Burma
Claudia Hamann for blue zircon ("starlite") from Cambodja
Henry A.Hänni for lapislazuli from Afghanistan, faceted tanzanites, and yellow glass cut in the shape of a beryl crystal
Hildy Rost for stained quartzite
Peter Groenenboom for green opal from Serbia/Croatia
Denis Gravier for rough pezzottaite samples
Lore Kiefert for emerald crystals from Colombia, and a spinel crystal from Burma
Peter Engels for pieces of Baltic amber
Heidi Haug for a sphere of Baltic amber
Martin Steinbach for rough and cut Trapiche rubies
Bernhard Bruder for a lapislazuli sample
Société Abouchar for the loan of 10 brilliants for SSEF Diamond Grading classes
Charles Abouchar for three irradiated black diamonds
Dora Fourcard for a collection of Tahiti cultured pearl quality samples
Dusan Simic vom EGL New York for blue and yellow sapphires with Be-diffusion
Jean Daniel Junod for a parcel of conch shell, conch pearls, and amber with parent rock
Difima Kembo for amber from the Dominican Republic
José Casares for Indonesian cultured pearls.
Edward Johnson for light purplish jadeite
Schoeffel, Hong Kong, for three strands of freshwater cultured pearls
Frieden AG for three South Sea cultured pearls with artificial colour modification

Products for sale at SSEF

In the last few years, SSEF has increased the number of products for sale. Many of our products have been designed by SSEF and are only available at SSEF or our official outlet for USA (GemstonePress, Woodstock, USA). Please check the attached product list. For all further information about prices and shipping, please contact Petra Niggli or Sonja Schwarz from our administration or send us an email at gemlab@ssef.ch

SSEF Miscellaneous:



Do you find the differences between the two photos?

The SSEF team wishes all its friends and customers a successful 2004 and would like to express its warmest thanks for your continued support of the laboratory