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Dear reader

Last spring we were able to organize a great event on Swiss soil, GemmoBasel 2005, which proved to be one of the social highlights of the gemmological year. With this international conference, SSEF attracted almost 180 gemmologists from 28 countries and scientists from everywhere in the world. This brought it home to us how closely linked gemmology is today, and how firmly SSEF is established in



this global network. The spring of 2005 also saw the founding of the SSEF Alumni Association within a formal framework. This network of past participants in SSEF courses has since seen considerable growth and naturally this gives us great pleasure.

2005 was, however, to become a year of transition. We were sorry to

see the departure of Dr Lore Kiefert as the SSEF was losing a distinguished colleague. We still have good contact with Dr. Kiefert and both laboratories benefit from this. Our analysis technician then retired and we also are prepared to the advised departure of our cheerful Sonja Schwarz from the secretarial side, who was going on her planned travels. This means that in 2006 the SSEF team will have to find a new personal structure, not an easy assignment for a well-working system. Our customers have been largely unaware of these upheavals since our standards have been maintained and our prices and delivery times remain unchanged.

Have you already considered what SSEF does so uniquely? A small team of highly-qualified gemmological specialists is daily working at the cutting edge of the profession. There are lively exchanges of opinion, for they all sit in the same room and are studying the same pieces. The analytical equipment is now generally used by one specialist but every gemmologist who needs it because of time constraints or some other reason can have access to it. The very best of analytical equipment is available in the laboratory and decisions can be rapidly brought about. The collection of samples of raw material and polished stones has been scientifically built up and provides certainty and comparability. A good library and many years of result of research are ready to be consulted and the collection of reports on all the stones analysed to date is accessible at all times. Our clients can talk to whichever of our specialists has processed

their order. Most of them are trilingual. Certificates are drawn up in German, French or English as requested. Stones usually spend less than a week in our laboratory. The international reputation of some of our clients and their significance both within and outside Switzerland reflects the quality of our work. Special mention must also be made at this point of the more frequent demand for our quality checking service for small diamonds for the Swiss watch making industry. Swiss quality watches, as often as not, rely on SSEF to perform a quality check of their diamonds in order to provide an additional qualification for Swiss Made.

Further proof of the high standard of our services is provided by the fact that SSEF is increasingly assigned the task of training company and laboratory personnel. SSEF specialists participate on the front line in international committees (CIBJO, LMHC) on matters such as the harmonization of laboratory routines or the definition of nomenclature standards. The contributions of the Swiss industry associations and our clients help SSEF in the fulfilment of its supporting function for the jewellery sector both now and in the future. I have now been able to derive 25 years of pleasure from this interesting work and cooperation and I thank you for the confidence and support that you give SSEF.

Prof. Dr. H. A. Hänni,
Director of the Swiss Gemmological Institute SSEF

SSEF membership fee:

Dear SSEF Client

Did you already know that the SSEF Membership fee is due on February 28, and a reduction of approx. 20-30% on the normal tariff list is granted to registered members only ?

Impressum:

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Switzerland

First hand information from some African gem sources

It is rather rare that a laboratory gemmologist goes out for fieldwork. Normally the gemmological lab requests a steady presence because the customers always urgently need test reports. Fortunately the author can rely on his excellent staff gemmologists and a trip to African mining and market places could be done in August 2005. It is of great importance to have a gemstone collection available with all kinds of stones, natural, treated and synthetic. Not only for in-lab training, but also for reliable identification work and for research samples from known origins are crucial. The author was lucky to be invited by his friend and experienced miner and rough stone buyer Werner Spaltenstein to join him by a buying trip to East Africa and Madagascar. Werner is originally Swiss but lives since over 25 years abroad, mainly in Thailand, Tanzania, Kenya and Madagascar. He speaks besides German also French, English, Thai and Suahili, a big advantage to get in touch with the local people. We started the trip from Nairobi and visited Madagascar and Tanzania within three weeks. It was surprising to see how unspectacular some mines appeared, just holes in the ground and rarely what you expected to see regarding size or equipment. Also the stones often are not very attractive, and become gemmy only after cutting or even treatment. His local partners who provide the office, security and did the paperwork usually export the rough that Werner was buying. Werner is constantly on the move between the sources and his cutting facility in Chanthaburi (Thailand), where his Thai Partner Ae Chaiyakul surveys the cutting and selling of the merchandise. His outlet in Bangkok, more easy to reach is directed by David Weinberg



Fig.1 Werner Spaltenstein (right) in his office in Chanthaburi with Prof. H.A.Hänni
© H.A. Hänni, SSEF

(www.multicolour.com) who offers a large stock in all the East African gemstones that Werner has collected from his smaller and larger suppliers: sapphires in all colours, spinels, garnets in red, yellow, green and colour changing, tourmalines, chrysoberyls transparent or cat's eyes, moonstones and many more. And while his partners sit in their comfortable houses, Werner is again on the move. His shirts are drying equally well in Chanthaburi as in Tananarivo or in Mombasa or Arusha.

Tanzania

Werner Spaltenstein sat in the office of his agent in Arusha and checked the lots of tsavolite (vanadian green grossular garnet), tanzanite, sapphire in fancy colours, pink and mauve spinels and green tourmaline as well as orangey, violet and pink garnets with his fibre light. The sellers were local dealers or Massai tribe people in their local outfit. Occasionally we also encountered less common minerals such as white moonstones (peristerite), kornerupine, clinohumite, diopside or large spinel crystals. Werner priced the merchandise quickly and resolute. His first offer is always definitive and he does never bargain. So his plastic bag got fuller and fuller, and the money drawer of his agent got more and more empty. The guardian in front of the office took care for a safe situation and a quick exchange of brokers. After three days he has seen all stones that interested him and we proceeded to the south. Werner called his pilot and with his plane



Fig.2 River landscape at the Muhuwesi near Tunduru (S-Tanzania) containing gem minerals in its gravels.
© H.A. Hänni., SSEF 2005

we reached the Tunduru area. Along the Muhwesi river gravel was washed in order to separate the gemstones. Since 1995 this locality is producing sapphire (blue and pink), chrysoberyl (including alexandrite and vanadian chrysoberyl) spinel, garnets (including green), tourmaline, zircon and occasionally diamonds. At the banks of the river the camp is situated where Werners partner lives and surveys the washing of gravel in jigs. Trucks, caterpillars and bulldozers are numerous and it is obvious that the heavy duty requires a lot of maintenance. Gemstone mining is a costly matter and not a lucky draw for free.



Kenya

Nairobi is an important market place for gemstones because of its position, comfort and infrastructure. Dipak is Spaltensteins agent in Nairobi and he shares his office with Werner. He acts as purser and exporter. In the outer office brokers sit in line and

Fig. 3. Werner Spaltenstein and Dipak Patel buying rough tsavolite in their Nairobi office. © H.A. Hänni, SSEF 2005

wait for their turn to present their stones. The sellers praise their merchandise and Werner gets them down in Suahili. Dipak grabs a pack of bank notes and the black man left the room leaving his illusion back, however with a package of banknotes in his pocket. "The next please, hurry up and get your stones out!". Occasionally Werner has to leave the room for a while, to get some kilos of banknotes for the next businesses. The most important stones we are seeing are large lots of beautiful green tsavolite garnets, sapphires from northern Kenya and pink sapphires and rubies. Some people from Congo may greet Werner in French, they usually carry some diamonds and hope for a better price than in Congo. At the end of the day Dipak will seal a heavy box, ready for the shipment to Thailand. Soon after that Werner will brute and pre-shape his stones in Chanthaburi, see if his presumptions were correct in respect of weight yield.

Madagascar

After a short flight from Nairobi with Air Mauritius we have reached Antananarivo, the capital in the centre of the island. Werners partner with an impressive off-road pickup car was getting us from the airport. With the same car we started the trip to the south, visiting mining places along the track to Ilakaka.

We spent four hours (one way) on a shaky natural road to see a humble pit from which pink sapphires are produced (Nautamine is recommended, pills against seasickness). I guess every large mine has started as an unattractive hole in a pasture place. In Antsirabe Werner has a property with house and courtyard. His close relationship to the former president became a problem when the new president was elected. During riots his home was ravaged and he could not show up in the country for a couple of years. But now he is back to take up his business at Ilakaka (800 km southwest of Tananarive). This originally small place (5 huts on a dirt road) is now a larger accumulation of adventurers. It was in 1998 that by chance the gravels with gemstones were discovered. The gravel has the same composition as we know from deposits in Sri Lanka and Tanzania: sapphire, chrysoberyl, spinel, tourmaline, garnets. We can explain this similarity by global plate tectonics and continental drift: a former huge landmass, containing the accumulated gems wealth of an earlier mountain range is broken in pieces millions of years ago. Some of the treasure lies still on the African continent (Tanzania), part of the treasure is on Madagascar that broke away from the continent. And another part of the deposit lies on Sri Lanka that, also being part of the African landmass, took its way with Indian sub continent to north, folding up the Himalayan mountain range. It is because of these tectonic movements that most of the Ceylonese, Tanzanian and Madagascar sapphires look so similar, they are from the same sources. The gravels in Ilakaka are excavated in depths from 1 to 10 meters, in open cast mining and also in tunnel mining. When we reached the small town Werner was warmly welcomed an eagerly expected. Hundreds of diggers and brokers queued up in front of the small house where Werner does his business. Due to the crowd the main street was blocked. Behind a window with bars Werner was constantly buying small and big lots of light coloured sapphires, spinels and chrysoberyls. This was pay-day for numerous families. Werner is a socio-economical relevant factor since he buys from so many small dealers and thus makes live hundreds of family members. It is mainly small stones in lots up to some kilos that he buys, most of them will undergo thermal enhancement. His stone bag gets fuller and the money bag gets empty. After three days the marked is cleared and we mad the return trip. In the city of Antsirabe pink sapphires and gemstones from pegmatitic origins were available (tourmaline, orthoclase).

Thailand

Together with his partner Ae Chaiyakul Werner Spaltenstein keeps an efficient high performance gemstone cutting factory in Chanthaburi. Over 80 cutters work on the stones coming from Werners



Fig.4. A crowd of seller in front of the stand of Werner Spaltenstein in Ilakaka (Madagaskar). © H.A. Hänni 2005

buying trips in East Africa and Tanzania. The wealth and beauty of these treasures is impressive. The related sapphire cooker facilities provide the necessary treatment to enhance the bulk of the corundums. Hopefully the necessary disclosure of the treatment goes with the stones when they are sold, because it is an international requirement (CIBJO World Jewellery Confederation) to inform any consumer of the nature of the stones. Since most of the stones are transparent, they are faceted, the preferred way to cut the surface. With stones that are distinctly included the domed table is faceted in a chessboard pattern. With highly included or translucent stones a cabochon cut is applied as a rule. We have seen moonstone, mandarin garnet (spessartine), rhodolite garnet and spinel in cabochon quality. Extremely impressive are the different colours and shades available with only garnets: red, yellow to orange and brown, green and colour changing in sizes up to over 10 cts. For Werner it is important to preform the larger stones personally so that he get a precise idea what he was buying and what will be the potential of the material. For Werner a quick turnover is important, her needs the cash to buy new stones in Africa since his diggers have collected new material and need are longing for a payday to nourish their families. They wait for "Malapa" (the man who walks in sandals). And when he comes I hear all around in the airport, at customs, in ther city "jambo malapa" (hello malapa).



Fig.5 Werner Spaltenstein trimming with tongs rough tsavorite (vanadium grossular garnet) in Chanthaburi. © H.A. Hänni, SSEF 2005

Tokyo LIBS:

In January 2005 Prof. Hänni and Dr. Krzemnicki were invited by the Gemmological Association of All Japan to Tokyo, in order to demonstrate the function of GemLIBS at the booth of GAAJ in Tokyo. For analysing gemstones, Laser induced breakdown spectroscopy (LIBS) technique can reveal chemical composition, and especially light elements as Li and Be, even in traces, are possible to identify. During the Tokyo trade fair the potential of the SSEF GemLIBS was demonstrated to the broad public. As a consequence of the very positive results of Be identifications the board of GAAJ ordered a GemLIBS system from SSEF. In May 2005 the complete system was fixed in Tokyo GAAJ laboratory by Dr. Michael S. Krzemnicki, who also trained the responsible lab staff. Since then the GemLibs is in use for routine Be identification for Be-diffusion treated sapphires. GAAJ who started the Be detection with their own mass spectrometer is in a perfect position to monitor the results of GemLibs, a fact that would be most interesting for Mr Ted Themelis, who continuously denies the utility of the LIBS method for Be detection.

EMSLIBS conference 2005 in Aachen (Germany)

As in 2004 Dr. Michael S. Krzemnicki has participated at the LIBS conference that was held at the Fraunhofer Institute for Laser technique ILT. During this three-day conference on laser induced plasma spectroscopy he presented in a lecture his results on LIBS application in gemmology. Again a number of interesting stimulations and contacts led to a profitable result of the participation that will have an influence on future gemstone analysis. End of September Dr. Krzemnicki visited the well-known physicist and LIBS researcher Prof. N.H. Cheung from the Baptist University of Hong Kong. They discussed a common research project on gemstones. Current research topics are LIBS analyses on emeralds and cuprian tourmalines from different origins.

Cuprian elbaite from Mozambique which are currently investigated at SSEF with LIBS @ H.A. Hänni, SSEF 2005



Lizard in amber an artefact?

A private collector brought an impressive sample of what appeared to be a well-preserved lizard in yellow amber (fig. 1) to the SSEF lab for identification. The piece, which measured 15 x 8 x 2.5 cm and weighed 196 g, looked almost too good to be true: The reptile was in excellent condition, and its scales were still green and sharply defined. The top of the sample was polished with a domed surface, while the bottom was rough and chipped.

The characterization of such an item requires identification of the resin and confirmation that the sample was not assembled or otherwise created artificially. The rough bottom surface made it easy to remove a minute amount of the material for an FTIR powder spectrum (KBr pellet method), which was performed by Prof. Stefan Graeser of the Mineralogical-Petrographic Institute at Basel University. While the recorded spectrum was consistent with

Basel, and fortunately they allowed us to examine a well-known *Anolis* lizard in Dominican amber (see E. Gübelin and J. Koivula, *Photoatlas of Inclusions in Gemstones*, ABC Edition, Zurich, 1986, p. 227). This sample displayed clear anomalous double refraction between crossed polarizers, whereas the client's piece showed no strain in the material, around either the lizard or the numerous bubbles. Magnification revealed that the feet of the museum's reptile were dark brown and almost dissolved, while delicate features in the feet of the client's lizard were still intact. An x-radiography also produced some interesting results: While the *Anolis* lizard had only a weak skeletal outline, the bones and even soft tissue of the client's lizard were clear and sharp. The latter image also showed broken bones in both upper arms, as well as the presence of fine shrinkage fissures along the length of the lizard (Fig. 2). Not being experts in amber and amber inclusions, we decided to send some detailed pictures to a specialist in the field, Dr. David Grimaldi of the American Museum of Natural History. He concluded from the submitted information that the sample was one of a number of similar mounted pieces of lizards in kauri gum from New Zealand. He reported that such pieces were known to be manufactured at the beginning of the 20th century for display by naturalists. Therefore, we reported to the client that this was a modern lizard artificially embedded in a recent natural resin.



Fig. 1: This most unusual sample (15 x 8 x 2.5 cm) proved to consist of a modern lizard that was artificially embedded in a natural resin.

© H.A. Hänni, SSEF 2005

a natural resin, unfortunately it did not allow discrimination between the three possibilities: amber, copal, and kauri gum. When the sample was rubbed with a piece of fabric, a strong aromatic smell was produced. This ruled out amber, since the material clearly contained unevaporated volatiles. Further, rubbing with a cotton swab dipped in ether had no effect on the sample; this ruled out copal, which would have been slightly dissolved.

For comparison with a known specimen of this type, we contacted the Natural History Museum of



Fig. 2: Radiography of the lizard in the Kauri Gum specimen.

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(This article appears with more pictures in *Gems & Gemology*, *Gem News International*, Spring 2006 issue. The identification of the resin is still in progress with a Mettler-Toledo using DSC technology.)

CVD synthetic diamonds:

a study on two brilliant cut, colourless specimens of 0.73 and 0.71 ct



Fig. 1: CVD synthetic diamond specimen of 0.73 ct.
© H.A. Hänni, SSEF 2006

Diamond shows such exceptional optical, physical, chemical and electrical properties that today it is a material of strategic importance for the industry. Although it is available in large quantities in nature, natural diamond crystals show defaults that do not fit with industrial requirements. Defaults of synthetic diamonds may be controlled and therefore the demand for this material is increasing.

There are two different ways to crystallise synthetic diamond. The first is a High Pressure and High Temperature (HPHT) method which needs simultaneously high temperature and pressure (about 1200°C. and 45 kBar). The second method called Chemical Vapour Deposition enables the deposition of carbon atoms on a substrate at low pressure but high temperature.

Please remember here that a synthetic diamond is not a diamond imitation such as zirconia, synthetic moissanite and synthetic rutile. These imitations do not have the exceptional properties of diamonds. The DTC Research Centre recently loaned us two CVD synthetic diamonds made by Element Six, a producer of synthetic diamonds, and we report here an abstract of our study.

Gemmological properties

The two stones are in the round brilliant cut, they weight (A) 0.735 ct and (B) 0.714 ct respectively. Their colours were compared to the SSEF diamond master set for the grading of colourless diamonds. Both of them show a pinkish brown hue and stone A is graded „Slightly tinted white (J)“ while stone B is graded „Tinted white (K)“.

Microscopic observation reveals that the table of stone A is engraved „CVD N28 0.73ct“ and stone B

„CVD N25 0.72 ct“.

The girdles of both stones are polished. Some minor crystallisation growth defects are visible. On the pavilion side of stone A, a non polished extra facet shows a very fine step-like structure unlikely to be observed in natural diamonds.

Apart these last observations the internal clarity of both stones is extremely clean and only show a few white pin-point inclusions.

With crossed polarizer filters we observed strong coloured anomalous double refraction and parallel growth lines in one direction perpendicular to the table.

Under UV light, both stones show an orange fluorescence which intensity is equal with long and short waves. Both stones show no phosphorescence using traditional UV lights, neither using the DiamondView™.

Spectroscopic properties

Infrared absorption spectra at room temperature and low temperature UV-visible and near infrared absorption spectra only show that both stones are of type IIa. The photoluminescence spectra recorded at low temperature on our Raman microprobe using a 514.5 nm excitation laser source show a 596, 597 nm doublet and NV centres in their neutral and negative state.

Fig. 2: The two studied synthetic CVD diamonds. These two round brilliant cut stones weighting more than 0.70 ct are currently the largest colourless CVD synthetic cut diamonds ever studied by SSEF Swiss Gemmological Institute.
© J.P. Chalain, SSEF 2006



We are thankful to the DTC Research Centre for the loan of these two synthetic diamonds that enables the SSEF Swiss Gemmological Institute to get ready for the challenge of identifying synthetic colourless diamonds of this new generation. A detailed study of such CVD samples is published by Martineau and al., (2004), G & G, Vol. 40, No.1, pp. 2-25. Further interesting information on CVD are online at: <http://www.e6.com/>

Dying of gemstones

Methods to detect dyed stones

Every gemmologist has encountered dyed gemstones. But when it comes to identification of the dying material little information is available about the composition in gemmological textbooks. In order to obtain the DUG (Diplôme Universitaire en Gemmologie) of the University of Nantes (France) our new colleague Pierre Lefèvre has undertaken a comprehensive study in which he has investigated numerous dyestuffs and identification features of them when introduced into gemstones.

The main target was identification with spectroscopic means of some dyestuffs used in India and Thailand. He also investigated simple gemmology methods as well as other laboratory methods how to identify dyed gem material.

It became clear that dying substances from India are generally suspended in line seed oil, whereas the Thai are using suspension in Paraffine oil. Since the dyes are strongly diluted in the solvents, the identification of the molecule is difficult.

Based on his research it is assumed that the sample dyes from India belong to the ketones with



Fig 2: The investigated dyestuffs from India.
© P. Lefèvre, 2005

carbonyl as functional group, whereas the sample dyes from Thailand are rather conjugated aromatic ester compounds.

Numerous reference spectra from dyestuffs have been recorded in order to identify the same material when encountered in treated gemstones.

By comparison of treated and untreated samples the utility of various tests for dying identification was investigated. It became clear that only a combined and comprehensive investigation of a sample permits an identification. The necessary instruments include dichroscope, a spectroscope, a loupe (or

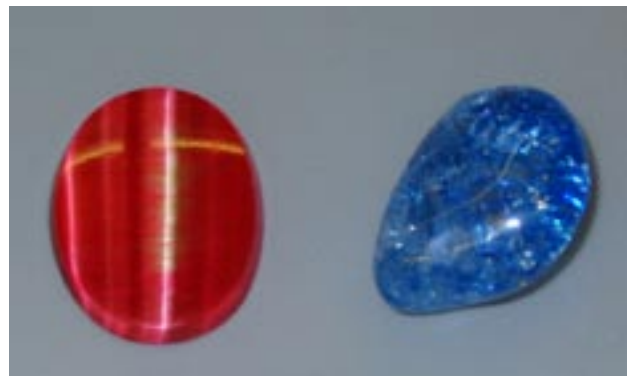


Fig 1: red dyed quartz cat's eye and a blue dyed rock crystal. © P. Lefèvre, 2005

better a gemmological microscope). In many cases it will be necessary to record with spectrometers in the UV-VIS or IR region for a safe identification. Even a chemical analysis (ED-XRF) may in some cases be necessary. All these methods are complementary and performing one test alone would be dangerous.

The SSEF Swiss Gemmological Institute is well equipped with gemmological and scientific instruments in order to identify colour treatments by impregnation in gemstones and pearls.

The treatise (in French) (36 Seiten) can be ordered at SSEF (tel. 061 262 06 40, e-mail: gemlab@ssef.ch). Reference: Les teinures des gemmes, diplôme DUG, Université de Nantes, France, 2005



Fig 3: Undyed and dyed jadeite (B- and C-Jade).
© P. Lefèvre, 2005

SSEF Courses in 2006

The SSEF is organising in 2006 a varied programme of various courses. Our popular basic courses providing the fundamentals of gemmology (SSEF Basic Training) and the general diamond course including diamond grading (SSEF Basic Diamond) are both finished with theory and practical exams. (see section „congratulations...“). Through further education programmes (SSEF Advanced Training) topics of the basic courses are broadened.



Hands-on practical workshop during a SSEF course © M.S. Krzemnicki, SSEF 2005

We want to point out to you the so-called practical days, which will take place 20th March, 25th April, 6th June and 24th October. This offer addresses to all interested people that want to freshen up their skills and practice under guidance with actual gemstone material. You can use the day by testing stones from our collection, or bring your own material. Up to date equipment and professional care helps to significant steps forward.

Further we are offering a unique high end Scientific Gemmology and Scientific Diamond course, where laboratory staff and well-educated gemmologists from all over the world are taking advantage. Each of these courses takes one week, and participants (not more than 4) learn the application of spectrometers and the strategies of as safe instrumental gemstone and treatment identification, as developed in the SSEF laboratory.

For a complete course programme or more information please contact

SSEF: gemlab@ssef.ch (tel. +41-(0)61 262 06 40) or see our website www.ssef.ch where you can download the actual course programme

Scientific Diamond Course

In April 2005 SSEF has carried out its first Scientific Diamond Course (SDC). The participants Dr. M. Bisio (CISGEM) and Daniel Boucard received the SSEF Scientific Diamond Certificate. This new course is a completion of the Scientific Gemmology Course that cannot stay long enough with diamonds to cover all necessary items. The scientific diamond course takes one week and brings the participants to the forefront of synthetic diamond and treatment identification. Up-to-date analytical equipment is demonstrated and the participants exercise the various techniques themselves. The next SSEF Scientific Diamond Course will take place from 16. till 20. October 2006. The provided methods include infrared spectroscopy (FTIR), absorption spectroscopy in visible and ultraviolet (UV-VIS) at low temperature (-120°C), and photoluminescence spectroscopy (PL) at low temperature. Participants will experience themselves the methods, and the course notes contain numerous spectra. They also contain two valuable tables, which summarise the „Defect Induced Vibrational Bands“ and the „Optical Bands“. A list of reference books is also given.

For further information contact SSEF:

gemlab@ssef.ch (tel. +41-(0)61 262 06 40) or see our website www.ssef.ch where you can download the detailed course programme.

First SSEF Diamond Foundation Course

In June 2005 SSEF education department has held its first Diamond Foundation Course (DFC) Participants were taught during a very intense week to perform the complete diamond grading. After passing an examination the successful students were given the SSEF Basic Diamond Certificate. The course was organised together with the Swiss Gemmological Society (SGG) and SSEF could make usage of the extensive diamond collection of the society. Because of vivid requests the DFC will be held again in 2006, namely in the week from 2nd to 6th October. In order to have a best benefit and learning effect for participants we are restricting the number to 8 per course. This course is aimed at people working in the jewellery and watch industry. Previous experience is welcome but not a requirement.

For information and application contact us by phone (+41 (0)61 262 06 40) or email (gemlab@ssef.ch).

SSEF and the education of masters in goldsmithing

Since many years SSEF has been involved with the education of goldsmiths and jewellery sales assistants when it comes to gemmological knowledge transfer. In 2005 for the first time a higher education for getting a master goldsmith's degree in Switzerland. In the bounds of this extensive education SSEF was providing a course of three weeks for 9 people from the Berne region. A second group from Zurich was taught in evening classes over a period of nearly a year together with Peter Widmer. All participants passed the gemmological exams for gaining the masters degree as goldsmiths.

Potential future participants may register with Mrs Yvonne Koppitsch 044 446 97 73 or Markus Keusen 031 337 03 37 Schule für Gestaltung Bern-Biel. On 4th April 2006 an open public information is planned.



The participants of the Gemmological Course for the masters in goldsmithing. © M.S. Krzemnicki, SSEF 2005

Congratulations ...

SSEF Swiss Gemmological Institute wants to express its congratulations to the following persons for getting:

SSEF Basic Gemmologist Certificate:

With distinction: - Thomas Frei, Pratteln,
- Claudia Egger, Lachen SZ

- Elisabeth Bussmann, Zürich
- Julia Mathys, Therwil
- Bettina Stadler, Neuhaus
- Natalie Bracher, Bern



The participants of the Basic Diamond Course with the course convenor Dr. M.S. Krzemnicki © SSEF 2005

SSEF Basic Diamond Certificate

- Sandrine Dupont, ArteCad SA, Tramelan
- Mohammed Kandil, Lebanon
- Bernhard Lang FGA, Lang Goldschmiede, Basel
- Sabine Häberli FGA, Basel
- Reto Studer, Diamantheus, Bern

Only participants that pass the final exam receive the SSEF Basic Gemmologist or Basic Diamond Certificate. The qualification requires theoretical knowledge as well as practical skills in gemstone testing or diamond grading.

Advanced Gemmologist Certificate:

- special course in small diamonds quality testing
- Mirjam Mundwiler, ArteCad SA, Tramelan
- Simone Meigniez, Louis Vuitton SA,
- Biljana Jovanovic, Louis Vuitton SA,

Gemmology for the masters diploma for goldsmiths (group Bern-Biel, Switzerland)

- Adrian Gempeler
- Daniel Baumgartner
- Alexandra Döme
- Jörg Eggimann
- Senta Huber
- Rolf Kunz
- Claudia Neuburger
- Silvana Gennari
- Daniel Stöckli
- Anita Schürch-Knobel

SSEF Scientific Gemmology Course

Parasoon Devan, Eurostar India
Pierre Lefèvre, Belgium

SSEF Scientific Diamond Course

Dr. Martina. Bisio, Cisgem Italy
Daniel Boucard, Geneva

We wish all successful participants a bright gemmological future!

Foundation of the SSEF Alumni Association

On May 1st 2005 over 50 former SSEF course participants were invited to a festive event in Basel, in order to form the SSEF Alumni association. Mr Leon Ascot (FGA) was introduced as President, and Mr. Peter Groeneboom was presented as an Ambassador of the SSEF Alumni association. This association was made for former FGA students and SSEF course participants as well as people from other interested circles. It relates these people and offers a network among them, organises a platform for professional exchange on an international scale. You can thus become a member by sheer interest in gemmology without yet having followed a course at SSEF.



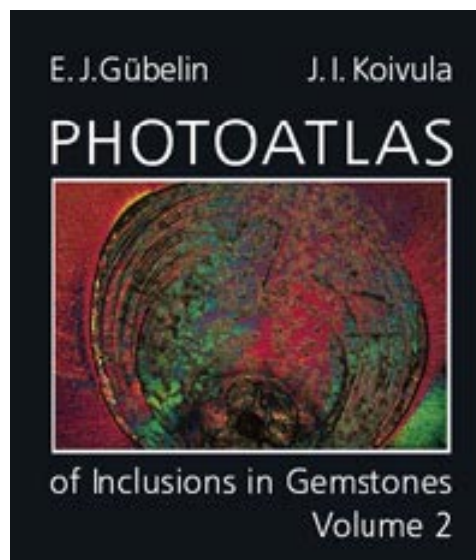
From left to right:
Tay Thye Sun, Wilawan Atichat, Hiroshi Kitawaki,
Mrs. Tay Thye Sun, Suvilai Wachiruksasawakul, Kanjana
Chookruvong, Nick Sturmman at the SSEF Alumni launch-
ing in May 2005. © SSEF 2005

Since the foundation we can already report from a very lively first year with a number of well-attended events. Quite a few Swiss course participants but also a number of international members have enrolled as SSEF Alumni. In September we organised the first SSEF Alumni excursion and visited the Grimsel electricity works (KWO Grimselstrom) and a nearby quartz cave. In the same month George Bosshart started the cycle of lectures with his exciting report on ancient jade track from Burma to China. The second lecture was in December and again over 30 people listened to Alexander Leuenberger. He gave first hand information about his experiences as a mine owner in Madagascar and gemstone dealer in Switzerland.

For 2006 we have planned further events exclusively for SSEF Alumni members. In our SSEF Alumni Newsletter that appears four times annually we are keeping you informed about the events. Also articles, reports and other forms of information will be communicated. On our internet homepage www.ssef-alumni.org you will be kept abreast of the latest news regarding our association. Here you may also enrol directly as a new member, or download on of the former newsletters.

We would like to introduce our sponsors of SSEF Alumni Association: **Eickhorst Systeme** (Hamburg) for gemmological instruments and lighting and **Bijoutil AG** (Allschwil) for goldsmith's equipment

Should you be interested to become an SSEF Alumni member, enrol directly or call SSEF for further information (tel. 061 262 06 40, e-mail: gemlab@ssef.ch).



“Photoatlas of Inclusions in Gemstones” Vol. II

An extremely beautiful and comprehensive book is now available: the second volume of Gübelin / Koivula's „Photoatlas of Inclusions in Gemstones“. This book deals with colour gemstones (as e.g. garnets, spinels, tourmalines, chrysoberyls, quartz, opal etc. and shows new varieties and important extension of pictures to stones that have been treated but shortly in volume one. Towards the end of the year the third volume will appear, presenting more inclusions pictures of the commercially more significant species diamond, ruby, sapphire and emerald. You should get your volume two before it is sold out and complete your library with an excellent scientific reference book and artistic work.

CIBJO News



The laboratory commission chaired by Héja Garcia-Guillermine and J-P. Chalain announced that two new CIBJO diamond mastersets were assembled for the colour grading of colourless diamonds. One of these series was formed for the Bahrain laboratory and the other one was produced for the Lithuanian laboratory.

On request of the CIBJO President Council, the Laboratory commission also announced the formation of a „Laboratory Steering Committee“. The CIBJO registration rules for laboratories are currently opposed to the registration of IGI a major diamond grading laboratory. An international law expert sent to CIBJO a report underlining that current CIBJO registration rules might possibly be in contradiction with EU regulations. Therefore the Laboratory Steering Committee chaired by the President of CIBJO himself aims to give proposal at the next CIBJO Congress in consideration of this case.

LMHC News

The Laboratory Manual Harmonization Committee -LMHC meets several times a year for harmonising gemmological certificates. This committee is formed by representatives of the following laboratories: AGTA-Gemmological Testing Center (USA), CISGEM (Italy), GAAJ Laboratory (Japan), GIA-Gem Trade Laboratory (USA), GIT-Gem Testing Laboratory (Thailand), Gübelin Gem Lab (Switzerland) and SSEF Swiss Gemmological Institute (Switzerland). Its work is written in a manual. Once or twice a year, the committee reports on its on going work and when necessary Information Sheets are delivered and published on the web sites of their respective laboratory web site.

This year the committee met three times. The first time in March in Tokyo in conjunction with the CIBJO congress that was organised in Hong Kong. Then it met in Milan in June and in October in Lucerne. A considerable work has been achieved especially in regard of lead glass filled rubies, padparadscha sapphires and emeralds. The next report will be given in Tucson at the GILC meeting on the January 31st. As soon as a definite consensus will be reached on one or several points it will be published on an Information Sheet downloadable from the SSEF web site (www.ssef.ch) as a pdf file.

LMHC „Heating project“

Recently, the LMHC decided to harmonise heat treatment identification criteria of sapphires.

A series of several rough unheated sapphires of known origin was selected. They are currently analysed by each LMHC laboratory with every currently known appropriated technique. In a next meeting, members of LMHC will compare their results and evaluate the pertinence of each method. Later, the sapphire series will be heated at several different temperature and similar tests will be performed and evaluated. An external expert is invited to each of the „Heating project“ meeting and will participate to the evaluation of the heating identification methods.

SSEF supplies CIBJO diamond mastersets

Diamonds forming a master-series are daily used by laboratories and also by diamantaires to colour grade colourless diamonds. They are selected by reference laboratories, SSEF being that of CIBJO and the GIA Gem Trade Laboratory being that of the GIA.

A diamond masterstone is precisely selected because it has exactly the same colour as the reference laboratory's masterstone that defines the limit between two adjoining colours. For example, the diamond that defines the limit between „exceptional white + (D)“ and „exceptional white (E)“ is a diamond masterstone. Whether they are selected by CIBJO or by GIA these diamond masterstones are equivalent tools because the original CIBJO masterset C1 is a perfect copy of the GIA original masterset as graded by illustrious gemmologists of both institutions.

SSEF is in a privileged position with the original CIBJO masterset C1 to offer other laboratories or clients to compose a diamond masterset for them upon request. For details, please contact SSEF at gemlab@ssef.ch (or tel. +41 61 262 06 40)

Easy shipping of stones from Europe to SSEF!

For more than two years we offer a service which has gained much appreciation by our clients. You may send your **unmounted stones or pearls** to our agency in Germany, which cares for all custom formalities:

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1. You need an insurance for the shipment
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3. A copy of this pro-forma invoice has to be sent to SSEF by fax +41 (0)61 262 06 41
4. Include the SSEF order form or a note in which you declare what kind of test/certificate you require
5. Then send your parcel to our agency in Germany:

SSEF

**c/o Erwin Morlock
Friedrichstrasse 26
D-79618 Rheinfelden, Germany**

For each direction, you may count with 3-4 working days for the shipping with mail service. Depending on our arrangement, we will need between 1 and 7 days for testing in the SSEF laboratory.

The costs for the complete importation/exportation formalities are:

1. Customs formalities and shipment back to you CHF 110.-
2. If you need no insurance for the shipment back to you, ca. CHF 30.- to 150.- depending on the value of the items

For sure, you may still ship your items to the SSEF directly, as listed in our shipping instructions. For more informations, please call SSEF (+41 – (0)61 262 06 40) or visit us at our booth at the Basel Fair or at the Gem Fair in HongKong in September 2006.

Eickhorst launches a new student microscope

Bright light, not sizzling heat – The new Cool-Touch GEMMOSCOPE microscope revolutionises dark-field illumination by keeping the microscope stage cool, even after hours of work. Developed and designed by SYSTEM EICKHORST of Hamburg/Germany, manufacturer of innovative Gemmological Instruments and Lighting Technology.

The new microscope stage maintains a cool touch due to the sophisticated SPECTROLIGHT darkfield illuminator. Gemstones are perfectly embedded in diffused daylight of High Intensity, equivalent to the lighting power of a 35 Watt quartz halogen lamp. This very noticeably exceeds the usual 25 Watt of other microscopes on the market. No question that these advantages are also apply to the use with brightfield illumination. This innovative step in microscope illumination technology also results in dramatic investment cost reductions.

Other welcomed user advantages are enhanced contrast and improved 3D Vision at flickerfree

DIGITAL lighting of 4,500 Kelvin daylight colour temperature.

Of utmost importance for the operator's working comfort IS the MAGNETIC-CLICK socket enabling to mount the stoneholder magnetically. The added benefit of the ergonomic stage, designed for comfortable wrist and finger positioning, is all day microscopy work.

The new GEMMOSCOPE StereoZOOM microscope is available with excellent optics of 10x – 40x Zoom range and optional magnifications, see photo. The optical system is available for DIGITAL camera adaption whether trinocular or binocular.

Additional information is provided on web-site: www.eickhorst.com/en/gem/outlook_gemmoscope_e.htm



Peter Giese retired

Our analytical technician Peter Giese has retired from his post at SSEF end of 2005. Mr. Giese has supported us the last eight years with analytical work and with maintenance of instruments. With great aptitude he has analysed all that rubies, sapphires, emeralds from UV to VIS and IR. He has governed our X-rays and was able to keep our PC's in good spirits. Finally he has trained his successor, Mrs Sigrid Recha who has now taken over most of his former tasks. We wish Peter Giese much satisfaction in his new period of life.



Close up: Pierre Lefèvre

Pierre Lefèvre is our new member in the laboratory gemmologist crew. He inherited his working place from Dr. Lore Kiefert who is now in charge of the AGTA lab in New York. Sound knowledge in both mineralogy and gemmology are needed to gather the position of a gemmologist in the SSEF lab. Pierre Lefèvre submitted himself to the harsh laboratory training to become a solid pillar of the SSEF team. He obtained previously his academic education as a mineralogist from Liège University, Belgium

(master 2 of science) and his gemmological diplomas also in Belgium (Belgian School of Gemmology, F.E.E.G.) and Nantes, France (D.U.G.). His Hobbies are archery and martial arts. Mr Lefèvre speaks fluently French and English, some Flemish and hopefully soon German. As he was teaching during his university period he is now also fit to support SSEF classes.



of presentations offered a wide spectrum of topics and subjects that inspired both gemmologists and people from the trade. The programme included sessions on the following topics: diamonds, coloured stones, methodology, trade issues, gemstone treatment and pearls.

In the first session on diamonds **Dr. Paul Spear** of the Diamond Trading Company (DTC) Research Centre in Maidenhead, UK spoke about methods of rapidly screening and identifying HPHT-treated and CVD-grown synthetic diamonds. **Prof. Emmanuel Fritsch** of the University of Nantes, France reported on advances in identifying and classifying the origin of colour in brown and black diamonds. **Jean-Pierre Chalain** of SSEF showed that the spectroscopic properties of a historical greenish yellow diamond are similar to those of HPHT-treated diamonds.

During the following session, **John I. Koivula** of the West Coast American Gem Trade Association Gemological Testing Center (AGTA GTC) fascinated his audience with photomicrographs of characteristic inclusions in gemstones from various origins. **Tay Thye Sun** of the Far East Gemmological Institute in Singapore talked about the distinction between natural untreated and treated jade. **Edward Boehm** of JOEB Enterprises, Solana Beach, California gave an overview on ruby mines in Mogok, Myanmar (Burma). **Dr. Karl Schmetzer** from Petershausen, Germany, showed rarities from Sri Lanka such as iron-rich taaffeite and iron- and zinc-rich musgravite. **Dr. Ulrich Henn** of the German Gemmological Laboratory in Idar-Oberstein presented the great variety of gem-quality feldspars.

In the third session **Prof. Henry Hänni** of SSEF talked about developments in instrumentation over the last 25 years. **Alice Keller**, chief editor of GIA - Gems & Gemology, gave participants an insight into the meticulous work of peer-reviewing, editing and producing a gemmological journal. **Manfred Eickhorst** of Eickhorst & Co., Hamburg, Germany, stressed the importance of appropriate illumination systems. **Dr. Gaston Giuliani**, of IRD and CRPG/CNRS, Vandoeuvre-lès-Nancy, France, demonstrated how oxygen isotope analysis can be used to distinguish emeralds from various provenances.

In the trade session, **Helen Molesworth** of Christie's, London discussed the importance of internationally recognized gemstone certificates. **Werner Spaltenstein** of Chanthaburi, Thailand, gave an insight into the adventurous life of a gem dealer in Tanzania and Madagascar.

The next session covered synthesis and treatment methods of coloured gemstones as well as the identification of treatment. **Eric Emms** of AnchorCert



Successful Conference GemmoBasel 2005

GemmoBasel 2005 - first international gemmological conference was from 29 April to 2 May, 2005, and 180 experts and participants from 28 countries met for the first public gemmological conference in Basel, Switzerland.

To celebrate the 60th birthday of Prof. Henry A. Hänni, director of SSEF, the Laboratory invited gemmologists and experts from all over the world to the "GemmoBasel 2005 - International Colloquium of Gemmology," which was held from 29 April to 2 May, 2005 in Basel, Switzerland. Renowned scientists and gemstone specialists presented their research in gemmology. The two-day programme



London described the three-fold impact on gemmologists of the proliferation of treatments. **Dr. Roy Walters** of Ocean Optics, Dunedin, Florida, and **Dr. Michael Krzemnicki** of SSEF presented a novel technique for the identification of beryllium-treated sapphires using „laser-induced breakdown spectroscopy“ (LIBS), a technique that was recently developed by SSEF in conjunction with Ocean Optics. **Dr. V. S. Balitsky** of the Institute of Experimental Mineralogy, Moscow, reported on distinction between quartz varieties and their synthetic equivalents. **Dr. Lore Kiefert** director of the East Coast AGTA GTC explained the various factors involved in determining the origin of sapphire.

In the session dedicated to pearls **Dora Fourcade** of Pacific Perles, Tahiti and **Andy Müller** of Hinata Trading Co., Kyoto, Japan, gave first-hand reports on the production of cultured pearls in Tahiti and the South Sea. **Elisabeth Strack**, of the Hamburg Gemmological Institute, reported on the occurrence and distribution of European freshwater pearls. **Nick Sturman** of the Gem & Pearl Testing Laboratory, Manama, Bahrain, gave the last presentation that dealt with the quality and trade of saltwater pearls from the Arabian Gulf.

With 180 participants from 28 countries the congress exceeded all expectations. The conference offered a unique occasion to meet with other specialists from around the world and to share information and experiences relating to this fascinating field. The interesting visit to Djeva S.A. in Monthey, a leading producer of synthetic gemstones, plus nice weather and an attractive supporting programme surely added to the good atmosphere at the event.

Numerous sponsors, amongst them several world-famous companies, contributed considerably towards the great success of the conference. SSEF would like to take this opportunity to thank all sponsors for their generous donations (see donation list above/below) without which the event would have

not been as rewarding and efficient as it was.

A Festschrift including all conference abstracts has been published on the occasion of the symposium. It can be ordered from SSEF - Swiss Gemmological Institute (phone +41 61 262 06 40, E-mail: gemlab@ssef.ch)

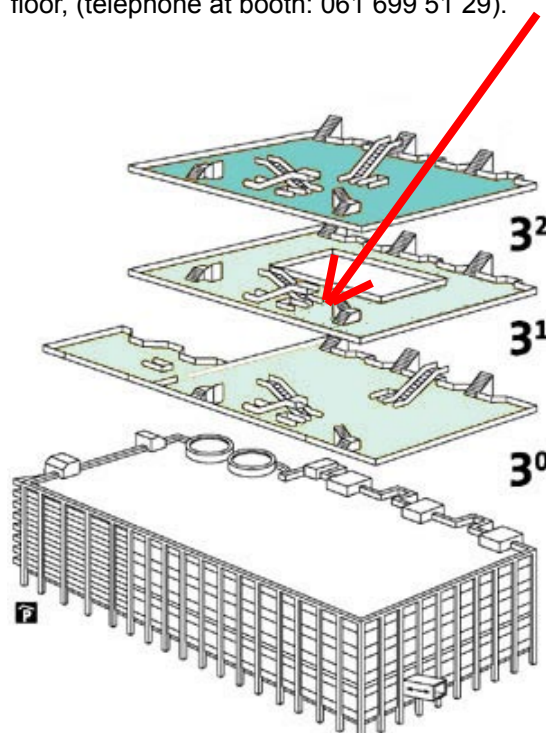
Visit us in 2006 for On-Site reports

2006 we will be available at the following trade fairs:

Inhorgenta München	17. - 20. Feb 06 (no reports)
Basel World 2005	30. March - 6. April 06
De la Paix Show, Geneva	13. - 18. May 06
Hong Kong Gem Fair	19. - 24. Sept. 06

Basel Fair 2006: Take profit from our 24h Express Service

As in former years SSEF offers during the fair (BaselWorld 30th March to 6th April 2006) this year again the well appreciated identification service: test reports within 24 hours. We welcome you to meet us in hall 3 (hall of elements) for a hello or a cup of coffee. You will find our booth at 3.1/N07 on the first floor, (telephone at booth: 061 699 51 29).



Donations 2005

We gratefully thank the following donators

A. Leuenberger (ALine) for fancy sapphire samples and rose quartz sphere showing multiple asterism
Gemological Institute of Thailand for a sapphire
Peter Groeneboom (AEL, Netherlands) for resin damor wood and cultured pearls
H. Stephan for synth. spinel doublets
E. Halasz for Maw-sit-sit specimen

P. Bardehle for a green jasper bead
Assoc. Prof. Dr. Nguy Tuyet Nhung (Nat. Uni. of Hanoi) for a set of cut Vietnamese gemstones
Golay Buchel & CIE for five colourless synth. sapphires
P. Nunes (Silva Stones) for green quartz
I. Lagneaux for charoite specimen
R. Strickler (Swiss-Cut) for a smoky quartz
N. Salima for a yellow synth. diamond
J. Hänni for 4 small diamonds
M. Graf (Grafgem) for lemon quartz
Bijoutil (Allschwil) for 20 loupes



The SSEF Team wishes all friends and customers a successful New Year 2006 and would like to thank you kindly for your continuous support of the SSEF laboratory.