



Gemmological Association Member

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REPORT ON ATTENDANCE AT THE SCOTTISH GEMMOLOGICAL CONFERENCE 2011

Friday the 29th April



After a welcoming reception on the evening of Friday the 29th April the first lecture was “The Love of Stones : Mineralogy, Art & Education in Nineteenth Century Britain” given by Professor Marcia Pointon. She opened with a slide of the painting “Lorenzo, The Magnificent” by Benozzo Gozzoli, from the Medici-Riccardi Palace Chapel in Florence which depicts a medieval procession with an interesting backdrop of white cliffs. The cliffs in the scene were a depiction of limestone formations known to the artist and he used them as a stage-set against which the colourful procession passes.

Moving on from this scene to the paintings of Claude Lorain Dr Pointon explained how natural scenery as a backdrop was gradually introduced into the art of painting although initially it was displayed in an “improved” and idealistic form. Natural features in landscapes began to be studied and appreciated after Edmund Burke’s analysis of the “Ideas of the Sublime and the Beautiful”. The Grand Tour experienced by the upper classes, however, led to an upsurge in drawing classes. Natural features in landscapes began to be depicted with a greater realism although some licence and exaggeration was taken in some depictions of nature’s “tourist attractions”. At first, the immensity of some natural features induced paintings of biblical terror such as those of John Martin.

Because of accusations of “landscape-untruths” committed by the artist J M W Turner, the great 19th Century thinker, John Ruskin, published his book “Modern Painters” in Turner’s defence. From 1799 the publications of John Ruskin’s many works on painting, geology and colour were widely read at home and world wide.

With excellent slides of Ruskin and some his own geological drawings (“Rocks in Glenfinlas”) Professor Pointon took us from the huge to the miniature. Ruskin had a collection of small more attractive stones, some of which he gave as gifts. We were enlightened to the fact he had personally labelled museum minerals and sketched the Colenso diamond. This was stolen in the late 1960’s and the painting was the only pictorial record of it. John Ruskin was indeed the ideal example of one link between Geology and art and we were enlightened further by revelations of gifts of stones (a pink Fluorite) and an opal presented to the artist Dante Gabriel Rosetti. This was an excellently depicted and very enlightening talk.

Saturday 30th April 2011

Dr. Karl Schmetzer



“Alexandrite” is the variety of chrysoberyl that has a red to green colour change phenomenon. The gemstone has been around for a long time, originally having the name “cymophane” applied to it; this name latterly has been applied to the cat’s eye variety of chrysoberyl. But what was the actual derivation of the name “Alexandrite”? In his first lecture “A Gem of a Birthday Present? - the history of the discovery of Alexandrite” Dr Schmetzer led the conference audience through the detective trail of correspondence he had uncovered whilst researching his book “Russian Alexandrites”.

Do we believe all we read on the internet or would it be better to study the source literature for our conclusions? The story that Alexandrite was given its name because it was found by the Finnish mineralogist, Nordenskiöld, on April 17th 1834, the same day that Alexander II of Russia came of age, was the story in fact created by a Russian novelist, Nikolai Leskov, in a novel called “The Alexandrite”. The book was written in 1884. Today, the Ural mountains in Russia are a major source of Beryllium, used in nuclear industries, and emerald and chrysoberyl are secondary considerations. In the early 19th century, (from 1831- 1853) the area as a source of materialistic gemstone wealth were the main consideration and seven mines were in the Tokovaya river area. Chrysoberyl was merely a by product of the emerald mining and the miners were always disappointed to find chrysoberyl rather than emerald. In 1833 one Count Perovskii had four mineral examples scientifically analysed which proved to be chrysoberyl but noted that they had a “special dichroism”. Using many excellent slides of original specimens (showing its colour change), portraits of the mineralogists involved, early mining scenes, maps and pictures of the original publications, Dr Schmetzer unfolded the story. The name Alexandrite first appears in a mineral book in 1842 published in Russia, the 25th Anniversary volume of The Russian Mineralogical Society. The mention is of two extraordinary samples in the Tsar Nicholas’s collection. Because of the extraordinary colour change the specimens were compared to gems of the first rank and the mineralogist, Nordenskiöld, suggested the name Alexandrite for this chrysoberyl. There was a Scottish angle introduced. The eminent Fellow of the Royal Society, Sir David Brewster, working in Edinburgh, received from Nordenskiöld for examination, a specimen which he analysed. He published in February 1835 what is now regarded to be the preliminary scientific description of the colour change observed between daylight and candle-light. There was however potential skulduggery involved. The real discoverer of the new mineral was the mine manager, Yakov Kokovin. He was responsible to two Russian state departments, the Imperial Cabinet and the Appanage department, of which Count Perovskii was vice president. The two men did not get on but there was a good understanding between Nordenskiöld and Perovskii. From analysis of documents and drawings regarding the loss of a major emerald, Dr Schmetzer traced the downfall of Kokovin through the “disappearance” of the emerald engineered by Perovskii. Perovskii went on to have the mineral perovskite named after him whilst Kokovin was jailed for four years and eventually ended up committing

suicide. This presentation held the audience throughout and was of the highest quality. It was a privilege to attend and be one of the first to hear of the Sir David Brewster connection to Alexandrite. This was a really good Scottish Gem-A scoop and probably the definitive talk on the source of the name “Alexandrite”.

Alan Hodgkinson :- **Specific Gravity**



It is probably only on occasion that members of the audience will carry out a specific gravity test. And is a specific gravity test really that exciting ? It would probably seem more like a welcome diversion from staring at a computer screen to go and weigh a stone carving. Nevertheless, Alan re-awakened the subject, reminding us that there were “beginners” in the audience, and proceeded to go through the many other ways it was possible to reckon the specific gravity of an object.

Alan, with slides, started with the traditional hydrostatic weighing method, moved on to the Hanneman Density weighing balance with hints and tips then moved on to a method rarely used nowadays, heavy liquids. Because of the poisonous nature and fumes from the three main liquids (Bromoform, Methylene Iodide, Clerici’s solution) and their expense, not a lot of people use them.

Alan however made the audience aware of sodium polystungtate, a heavy liquid that was soluble with distilled water and had the added bonus of having its specific gravity and relative refractive index linked forming a straight line graph. Thus, if a stone in an awkward setting “disappeared” when immersed, the RI of the immersion solution could also give a useful clue to the stone’s specific gravity. Alan gave several tips such as warning about temperature of liquids altering S.G. buoyancy, glass indicators with their specific gravities marked on them and “heft”, sometimes just holding the stone in the palm of one’s hand.....just try cubic hafnia. A very enlightening lecture with many timely reminders.

Dominic Mok :- **Testing Precious Gemstones in Hong Kong.**



After lunch, the next lecture was an eye opener on the gemstone trading and authentication scene in Hong Kong, which has been affected by the economic boom taking place in mainland China. By an excellent power point presentation with photographs, Dominic Mok of the Asian Gemmological Institute & Lab made the audience aware of the competition for business between laboratories. People with money, buying jewellery and gemstones, expect to see the best equipment: a refractometer and microscope just will not do.....!

Authentication of Paraiba Tourmaline from similar appearing Tanzanian material needs equipment such as an X-Ray fluorescence spectrometer. The problems were not always as simple as cut and faceted stones because there are collectors of prized “rough” crystal specimens. Minerals such as Pollucite, or Eudialyte needed identification and they were not the best shape (or size) to fit refractometers. The gemstone Jade (as we Europeans would call it) is one of the most prized stones but plenty of substitutes abound, Bowenite and Viridine to name a few. Dominic taught a few lessons on “Jade. The Chinese call all beautiful stones by the ancient symbol “Yu”. Nowadays, Jade is called Fei Cui Jadeite Jade,

although nephrite, omphacite..etc, are still regarded as 'Yu'. In the Hong Kong jewellery trade, the descriptions used are 'Fei Cui Jadeite' or 'Fei Cui Jadeite Jade' to describe Jadeite. If the stone is dominantly Omphacite, it is described as Fei Cui, Omphacite. Fei Cui is pronounced (Fay-Choy), The absolute requirements for top quality were a deep green and excellent translucency. The talk became a tour de force in the separation of the Jade triangle :- Jadeite, Omphacite and Kosmochlor, the jade types A, B, B+C and there was no shortage of pictures of major laboratory equipment such as Infra-red and F.T.I.R, Diffuse reflection Infrared spectrometers. A huge rock crystal ball was shown being tested with F.T.I.R to find out whether or not it was natural. All equipment, Portable Raman, UV Vis diffuse reflection spectrophotometer etc was almost immediately applied to cover the eventualities of having to differentiate between natural and treated blue, or yellow diamonds, whether the red colour of a coral was natural. In closing, Dominic gave notice that Chinese economy was really powering ahead, but there was a Chinese tendency to “gamble” with the money as the American dollar was not considered safe. The safest place to put money was a problem and this was leading to speculations on all strange “futures” gemstones being only a minor part of this. The Chinese wanted the best Labs.....but they were also prepared to pay well for them.

Stuart Robertson :- **Market trends and other illusions from the Trade**



Stuart Robertson from Gemworld International's publication, The Guide, opened by stating that treated gemstones were a big issue in the market. U.S and the European markets were slowly recovering but, in particular, Asian markets were going strong. Affecting prices were a lower US dollar, modest demand and a lack of mining. There was a lack of extra fine quality goods and the traditional “big three” were the best bets. The Chinese were influencing the market by their demand and, in the West, high prices were being asked because once goods were sold they were unable to be replaced. The US attempts to put an embargo on the Burmese markets were still affecting the situation.

A summary of the individual gems showed that sapphires were still top. The prices of top rubies were going crazy and this was resulting in rising demands (and prices) for spinel, rubellite (tourmaline) and would it spread to garnets? Emerald prices were improving. The demand for fancy colour sapphire was soft and zircons had to look right for their prices. Spinel other than nice reds were in good supply, the price of Peridot was stable and Aquamarine was gradually on the way up. Emeralds that were treated were no longer completely shunned in the USA, the Fred Ward effect waning and a better understanding of treatments taking hold. As long as treatments were proving to be legitimately disclosed, stable or removable goods were selling. Tanzanite demand was down and its market was weaker although higher prices were being paid for rough. Stuart went on to give other price trends with the thought of other probable colour substitutions taking place in the markets akin to Rubellite and Spinel replacing rubies.

In the 1930's it was practically unknown for the general public to be aware of gem treatments. Nowadays with heating, heating combined with other treatments, oiling dyes and now far more technically applied coatings and “blended products”, the markets were beginning to lose track of the core definition of a gemstone. “Rubies” that were 60% glass were more like “combined products”. Where did treatment stop and new products begin?

In summing up, Stuart said we were now seeing coated pink diamond melée, coated beryl, coated quartz, coated topaz etc..... There was no such thing as an industry wide treatment disclosure system: it was wholly inconsistent where it appeared and there was no authority policing the rules.

One could only face the music and dance.....and so the conference did with the end of the first day's business over it was time to invite all the guests to the evening ceilidh.

Sunday 1st May 2011

Sundays as always were divided into morning lectures with workshops in the afternoon. The morning saw the second of Dr Karl Schmetzer's talk's on Alexandrite. This talk was entitled "**Alexandrite – a special stone for experts, enthusiasts & connoisseurs**" and was an education on the chrysoberyl's twinning habits, the alexandrite's optical effects and their relationships with the twinning effect that produce "trillings". The crystallographic diagrams and photographs throughout the lecture were excellent with examples of (rare) single crystals, single "V" contact twins and the common cyclic twins which produced the tabular "hexagonal-appearing" forms. The majority of the material is found in a phlogopite mica matrix. The red to green colour change (and pleochrism) for which Alexandrite is noted was noted to be (from experiments with slices) variable in strength depending along which optic axis it was viewed and the main colour causing trace elements were found to be Vanadium, Chromium and Iron with some Titanium. The photographs of examples in immersion under crossed polars showing colour zoning with the colour change were classics. The most common inclusion in the Russian Alexandrites are mica. Needle like inclusions are found in Alexandrite from Sri Lanka.

Continuing, Dr Schmetzer went on to give information on the plotting of Alexandrite's colour change effect using the CIELAB colour space. Of the Alexandrite material that changed to red under incandescent light, not all had chromium as part of its composition. It was by careful plotting of colourimetric parameters that one could differentiate between colour change effects and discover that three main parameters were at play :- concentration and the situation of colour causing trace elements in the crystal lattice, the orientation of the table facet of a cut stone relative to the crystal axes and the thickness of the specimen, which affect the path length of the light passing through the stone. The colour change effect could not be said to be solely due to chromium in the composition. Colourimetry could be used as an aid to resolving the country of origin of colour change material. This was an information packed lecture well presented and it would be unfair not to close this paragraph without reference to Dr Schmetzer's book which has to be the best one on this singular gemstone, "Russian Alexandrites".

David Callaghan :- "**What a wonderful world**".



As David himself would probably put it, "If this person needs no introduction then why am I wasting my breath here...." 'What a wonderful world' comprised a collection of "slides" with the natural world as its theme. The artistry of jewellers, taking from nature what they had seen, had turned precious stones into gems with a panache that stood the test of time. The audience were treated to examples of birds, butterflies, wasps, damselflies forming hearts, flowers, dandelion clocks, etc, all manufactured from gemstones cut to suit or from utilising their natural shape.

A grebe had the body formed from an opal, a blister pearl formed the cap of a goddess, a swan.....no, not white....black, in 18ct gold the black effect produced by finishing the jewel in silver and oxidising it, and a double "Essex" crystal carved to depict not just the face of a bulldog but the rear of its head. The talk was delivered with David's astute analysis of how natural stone colours, their shapes and the

designers' insight had brought some pieces into being. And as always the talk was made all the more enjoyable, (after some heavier subjects) by his legendary witty delivery.

It was fitting that this talk on the past masters of creativity was followed by the presentation of prizes awarded to some future artisans of jewellery manufacture and to those who had excelled in the gemmological exams.

The remainder of the day was taken up by the eight workshops held by Alan Hodgkinson on Specific gravity, Dominic Mok on Jade, Lorne Stather on Diamond Grading, Barbara Leal on valuing Coloured Gemstones and Brian Jackson on optical phenomena. The students who had won the prizes had a display of their work and the day ended with a very convivial evening meal in Perth.



The remaining visitors of conference group were taken to see the mineral section of the National Scottish Museum on Monday morning.

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