LBMA

Alchemist

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In this issue

The LBMA has partnered with the Shanghai Gold Exchange to hold a Bullion Market one day Forum on 25 June, 2015. Details on registration, the speaker programme and hotel accommodation are available on the LBMA website.

London Precious Metal Prices: Raising the Benchmark

By Sakhila Mirza, LBMA General Counsel

Ruth Crowell observes the first auction of the new LBMA Gold Price on 20 March 2015

A 10-month journey

Over the last 10 months, the London bullion market has been subject to sweeping changes with regards to administration and ownership of precious metal benchmark prices for gold, silver and the PGMs.

The three fixing companies who had historically administered these prices are now dissolved and responsibility for the prices has transferred into the hands of independent administrators. The LBMA has also seen its role evolve during the last 10 months and it now owns all four prices.

The journey really began at the beginning of May 2014, when the LBMA only had responsibility for the Gold Forward Offered Rate (GOFO), as well as for the gold and silver forward curves in a joint partnership arrangement with the London Metal Exchange (LME). But by March 2015, both data sets had been discontinued, but the LBMA was not left empty handed, and instead had gained ownership of the four precious metals spot benchmarks. Two, gold and silver, became regulated on 1 April by the Financial Conduct Authority (FCA), along with six other price benchmarks. It certainly has been quite a journey for both the market and the LBMA over the last 10 months. In that time the LBMA has had to:

- launch two RFPs (Requests For Proposals Processes), two market seminars, numerous market surveys, and independent analysis to help understand the best proposal for the silver and gold prices;
- establish a new subsidiary (Precious Metals Prices Limited) under the LBMA, in order to own the intellectual property for all four precious metals benchmarks;
- respond to benchmark consultations launched by the regulators, which included the benchmark consultation under the Fair Effective Markets Review and then the Financial Conduct Authority's (FCA) consultation on the benchmark rules; and
- finally, act as facilitator between the market and the administrators during the implementation processes for all four metals.

Oh, and let me make a quick reference to my (and all lawyers') favourite topic – drafting numerous legal agreements!

All this, against the backdrop of the 'business as usual' agenda.

> *"Following the market consultation, made up of an RFP process, surveys and seminars, a market consensus emerged, with CME and Thompson Reuters (TR) selected to operate the LBMA Silver Price."*

From Fixing Companies to Independent Administrators

The LBMA historically has had nothing to do with the administration of the four precious metals daily spot prices. The silver and gold prices, for 100 years (give or take), and the platinum and palladium prices, for about 25 years, have been set by the respective Fixing Companies, all of which have now been wound down. The administration and calculation of the prices have been handed over to independent administrators as follows:

- LBMA Silver Price – CME and Thompson Reuters
- LBMA Platinum and Palladium Price - LME
- LBMA Gold Price – Ice Benchmark Administration (IBA)

The intellectual property all resides with the LBMA, in order to minimise any future market disruption.

Market Requirements and What Changed?

The Silver Fixing Company announced in May 2014, that with Deutsche standing down as a Fixing Member, it could no longer continue in its present form and it made the decision to wind down with effect from 15 August. The LBMA stepped in to work with the market to find and implement a solution to ensure that London and the global market had a silver price mechanism. All in three months! With the clock ticking, the LBMA launched a market consultation asking the market what it wanted. The consensus from the market concluded that it required:

- an independent administrator;
- an electronic auction-based platform;
- expansive participation; and
- an IOSCO Compliant solution.

Following the Silver Price Consultation, made up of RFP, surveys and seminars, a market consensus emerged, with CME and Thompson Reuters (TR) selected to operate the LBMA Silver Price. This left only five weeks for CME/TR to implement the solution within a very tight deadline. On 15 August, 2014, the LBMA invited the press to its offices for the official launch of the LBMA Silver Price. The press were given the opportunity to discuss how the auction process worked and to actually see it live. At 12.00pm, everyone became fixated to the TV screen, which showed the first-ever electronic auction for the first of the four precious metals. It all became clear what the auction process involved.

"Participants enter bids and offers, and where equilibrium is found between the bids and offers, within a specified tolerance, the price is said to have been found."

For the press and others seeing this on the screens for the first time it all made sense. More importantly, on this date, market disruption was avoided. London was able to retain its position within the precious metals markets, for continuing to provide a reference point for the global silver markets.

Following suit, the PGMs moved onto an electronic platform on 1 December 2014, and gold moved to an electronic platform more recently on 20 March 2015, but unlike for silver, these moves were not constrained by a fixed deadline, so the transition was less frantic, but not without their own challenges.

All three systems allow any market participant to join the auction platform, subject to their satisfying the participant's criteria set by the administrators and also the credit requirements. All three systems can be viewed by anyone anywhere in the world, with the auction platform available for view from various service providers. The independent administrators have monitoring and surveillance capabilities, reviewing the activities in the auction platform on a routine basis, all helping to increase transparency and raising the bar.

Regulation

On 1 April 2015, the LBMA Silver Price and the LBMA Gold Price both became regulated benchmarks; therefore, the administrators responsible for these benchmarks will need to be regulated and comply with the FCA rules and regulations on benchmarks. This does not however mean that the participants in these auctions will need to be regulated. The participants to these benchmarks are not considered to be submitters and therefore are not directly subject to the rules and regulations of the FCA as far as benchmark regulations go. However, they have to comply with the requirements that the administrators have put in place.

Nonetheless, benchmark regulation has provided many challenges, a lot of which have been addressed, but some still remain an issue. To date, the FCA has said that any LBMA price provided in additional currencies will be deemed to be a separate benchmark and will therefore be a regulated benchmark. This would mean that the administrators would have to take responsibility for oversight over the foreign exchange rate being used. The administrators continue to work with the FCA to see if a suitable solution can be found.

However, the regulations don't stop just at the UK level. The European Union is currently consulting on a draft regulation on benchmarks and, at the moment, it appears that the EU rules will capture all benchmarks which would include PGMs. The level of detail and what that means for how the existing regulations in the UK will change remains unclear. The LBMA will continue monitoring the developments and continue to report and update our members.

What's Next?

The role of the LBMA certainly expanded over the last year. In addition to the most important work of the LBMA on the Good Delivery List, and regularly holding industry forums, the Association today has helped to make the London bullion market less fragmented and to make it easier for the outsider to understand who does what. Nevertheless, much still needs to be done, but certainly enough momentum has been achieved. We at the LBMA will continue to work with the market, regulators and governmental bodies around the world to make sure London continues to lead within the precious metals industry and continues to provide for a truly global marketplace.

Sakhila Mirza, LBMA General Counsel
In her role as General Counsel of the London Bullion Market Association, Sakhila is responsible for all the legal and regulatory aspects of the work of the Association. She is the primary contact for regulators and governmental bodies, and travels extensively, presenting on developments in the bullion market. She has taken the lead in responding to government consultations on various financial and industry regulations, which has included responding to the Bank of England, Financial Conduct Authority and HM Treasury's joint consultation on Fair Effective Markets Review. In addition, she has taken on responsibility for the Association's work on supply chain due diligence, especially with regard to Responsible Gold Guidance and represents the Association at industry and multi-stakeholder regulatory forums. More recently, she has been proactively involved in the transition of the London precious metal prices onto electronic platforms, leading all the legal and regulatory discussions.

She brings with her a wealth of experience having previously worked in the energy and commodities industry where she dealt with compliance, legal and regulatory matters. She read law at the London School of Economics and went on to qualify as a solicitor.

The Sovereign – Setting the Gold Standard

By Victoria Newman, PR Communications Manager, The Royal Mint

Royal Mint Sovereign, obverse and reverse

Victoria Newman reviews the history of the Sovereign, the flagship gold coin of The Royal Mint, and one of the world's most famous gold coins with a rich and varied history that dates back for more than 500 years.

Dr Kevin Clancy, Director of the Royal Mint Museum, stated: "The gold Sovereign was first introduced in 1489 when Henry VII instructed the Mint to produce 'a new money of gold', which would be the largest coin England had ever seen, both in size and value, making in the process a strong statement about his reign. This coin was named a Sovereign and carried an enthroned portrait of the king in coronation robes on its obverse, whilst the reverse depicted the Royal Arms, crowned and superimposed on a magnificent double rose to symbolise the union of York and Lancaster. Large and handsome, the coin was clearly intended to augment the dignity of the king and to propagate a political message of stability and prestige, rather than to fulfil any pressing practical role in circulation. The Sovereign was struck in turn by each of the Tudor monarchs, the observe continuing to feature the reigning king or queen, before its issue came to an end under the rule of James I."

1489 Sovereign depicting Henry VII

The French Revolutionary Wars (1792-1802) and the Napoleonic Wars (1803-1815) led to financial instability and economic difficulties in Britain. In an attempt to restabilise the county's currency, the British Government took the decision to adopt the gold standard.

As a result of this Great Coinage of 1816, the value of Britain's currency became tied to the value of gold and a new circulating gold coin with a value of 20 shillings was introduced – the Sovereign.

Almost half the weight and diameter of the original Sovereign, the new gold coin of 1817 more than matched its predecessor in the beauty of its design. The Italian engraver Benedetto Pistrucci was given the task of designing the reverse image for this new 19th-century Sovereign and created his own classical depiction of St George and the dragon to take pride of place on the coin. Whilst this now iconic design continues to be struck on Sovereigns today, its initial outing actually lasted for only eight years before it was replaced by more conventional heraldic designs in 1825.

1817 Sovereign depicting St George and the dragon

Following a series of shields and Royal Arms designs, Pistrucci's St George and the dragon was selected to be struck on the Sovereign once

What are Proof coins?

They are the highest quality coin produced by The Royal Mint and are ideal for collectors wishing to own coins with the highest levels of craftsmanship and design detail.

The dies used to strike Proof coins are all hand-finished to ensure that all imperfections are removed before they are used to strike a coin. Proof blanks are of a higher quality than Brilliant Uncirculated and Bullion blanks, and each Proof blank is placed into a coin press by hand. Proof coins will be struck up to six times, at a lower speed and with less pressure than other finishes to ensure a smoother, sharper finish and to preserve the finer details of the design.

The dies are cleaned with air between the production of each coin to ensure that no marks or imperfections are caused during striking, and each Proof coin is removed from the press by hand and checked for imperfections after being struck. As a result of the extra care and attention, no more than 50 Proof coins can be struck per hour, whereas Bullion coins are produced at a rate of around 3,000 coins per hour. The Proof dies are regularly reworked and repolished to maintain a blemish-free finish when striking, and each die may only strike a few hundred coins before it has to be repolished.

It is not the quality of the finish alone that makes Proof coins so appealing to collectors and gift buyers. Often struck with low mintages, Proof coins are also rarer than other coins.

more in 1871 alongside the young head of Queen Victoria, until 1887. That year, to coincide with the Queen's Golden Jubilee, new designs were chosen to appear on circulating coins, but only St George was sanctioned by the Chancellor of the Exchequer to grace the Sovereign.

This principal gold coin of the United Kingdom went on to become recognised as currency across the globe and, at the turn of the century, more than 100 million gold Sovereigns were estimated to be in general circulation in the United Kingdom alone.

However, at the outbreak of the First World War in 1914, Britain needed tangible assets to help finance the war effort and the Sovereign became a luxury that it could no longer afford, leading to appeals to the patriotism of British citizens to give up their Sovereigns for their country rather than hoarding them in their homes.

A First World War poster from 1914

To supplement the coinage, the Treasury began to issue paper bank notes for these amounts, which came to be known as 'Bradburys', because they carried the signature of the then Secretary to the Treasury John Bradbury.

The first bank notes were issued on 7 August 1914, only three days after war was declared, in denominations of ten shillings and one pound, the equivalent in note form of the Half-Sovereign and Sovereign respectively, and continued to be produced until 1928, when the Bank of England took over responsibility for issuing the one pound and ten shilling notes.

The Royal Mint continued to strike Sovereigns on a decreasing scale until the summer of 1917, but these iconic gold coins are said to have largely disappeared from circulation in London by June 1915.

Despite the Sovereign's disappearance from circulation, the personal desire of many individuals to own a gold coin did not waiver and, in 1957, The Royal Mint recommenced striking the coin to a bullion standard to meet growing demand.

In a change of fortunes, the Sovereign has progressed from acting almost entirely as a circulating coin to one that continues to offer great appeal to gold bullion coin purchasers because of its reputation for integrity and assay accuracy – accuracy of fineness and also accuracy of weight and diameter.

> *"The Sovereign continues to bear the legendary St George and the dragon design created by Italian engraver Benedetto Pistrucci in 1817 on its reverse."*

It is also produced as a Proof quality collectable coin, whose annual 'release' is much anticipated by numismatic enthusiasts the world over, and it has come to play a key role as a golden gift for special occasions and anniversaries.

The Sovereign continues to bear the legendary St George and the dragon design created by Italian engraver Benedetto Pistrucci in 1817 on its reverse. When the minting of Sovereigns resumed in 1957, there was no thought to replace the classic design, which has appeared on every bullion Sovereign of the current reign with the exception of just four special occasions. These rare changes took place in 1989 for the special commemorative coins celebrating the 500th anniversary of the original Tudor Sovereign, in 2002 for the Queen's Golden Jubilee year, again in 2005, and in 2012 for the Queen's Diamond Jubilee.

Whilst the 22 carat gold Sovereign has seen some major changes occur in its country of origin in the century since the First World War, it has managed to remain fundamentally unaltered in its design and composition, and remains the most accurately specified coin in the bullion world, with its weight of 7.98805 grammes and purity guaranteed to five decimal places by the Coin Act of 1971.

Today, the quality of the Sovereign is tested using the most modern assay techniques and independently verified each year in one of the oldest known quality assurance processes, the Trial of the Pyx.

This is an independent judicial ceremony that dates back to the 13th century and takes place annually at the Hall of the Worshipful Company of Goldsmiths in London. Throughout the year, coins are randomly selected from batches of certain denominations struck during that year, sealed in bags containing 50 coins each and locked away in the Pyx chests for testing at the Trial (see overleaf for more details).

What are Brilliant Uncirculated coins?

Brilliant Uncirculated coins are a higher standard than circulating and Bullion coins, without the extra finishing and detail provided on Proof coins, and offer a good level of design detail but with lower definition than Proof coins. They are intended as an entry-level collectable coin or as the perfect affordable gift for someone looking to mark a special year.

Like Proof coins, the dies used to strike Brilliant Uncirculated coins are polished and finished by hand. Unlike Proof blanks, Brilliant Uncirculated blanks are machine-fed and only struck twice, so they are produced at a much quicker rate than Proof coins –around 100 coins per hour.

What are Bullion coins?

Bullion coins have a similar standard of finish to circulating coins. They are generally bought for their intrinsic qualities. The production of Bullion coins places an emphasis on efficiency of production and reducing cost.

The finish on Bullion coins is not specifically intended to highlight the detail and artistry of the coin's design, or the craftsmanship and skill of its minting. However, Royal Mint Bullion coins are renowned for their distinctive and beautifully rendered designs, and the beauty of the Sovereign in particular continues to capture the eye of the beholder in a Bullion finish

Victoria Newman, PR and Communications Manager, Royal Mint
Victoria Newman has worked as a PR and Communications Manager for The Royal Mint since December 2013. She is responsible for marketing the company's commemorative coins, medals and bullion products, in addition to running the press office function. Victoria has over ten years public relations experience working for clients in the public sector, energy, utilities and IT industries.

Trial of the Pyx

Sovereigns are inspected at the Trial of the Pyx

The Trial was first recorded publicly in 1282 and is today presided over by the Queen's Remembrancer or their deputy, who are amongst the highest legal representatives in the country, assisted by an independent jury of Liverymen of the Goldsmiths' Company.

During the ceremony, jury members are presented with Pyx boxes (Pyx being the Roman word for chest). The coins are selected from a random selection provided by The Royal Mint and are placed in copper bowls. The remainder are placed in wooden bowls and are then weighed for accuracy. The Trial is then adjourned until May to allow time for trial coins to be tested by Goldsmiths Assay Laboratory and the National Measurement Office.

They are tested against Trial Plates held by the UK National Measurement Office, and an independent jury, which includes senior financiers from the financial world accompanied by assayers from the Worshipful Company of Goldsmiths, confirms that the coins are within the statutory limits for metallic composition, weight and size.

> *"Modern legislation does not mention penalties for an adverse verdict by the Pyx jury, yet there have been stiff punishments for failure in the past."*

Whilst modern methods such as XRF (X-Ray Fluorescence) are often used in assaying, it is still only the centuries old methods such as cupellation (the fire assaying of gold) that are accurate enough in the testing of metals and therefore remain credible for checking the accuracy of the coins of the realm for the Trial of the Pyx verdict.

Modern legislation does not mention penalties for an adverse verdict by the Pyx jury, yet there have been stiff punishments for failure in the past. The Master of the Mint (today a role held by the Chancellor of the Exchequer) went to prison for six weeks in 1318 and even Sir Isaac Newton was at loggerheads with the jury during his time as Master of the Mint when the integrity of his coin samples was questioned.

Whilst the Trial is steeped in ancient traditions and attended by officers with some of the oldest job titles in the land, the Trial of the Pyx is as relevant today as it has always been. It continues to play an extremely important role in endorsing The Royal Mint's reputation for reliability and integrity, and guaranteeing the enduring excellence of the Sovereign.

Responsible Players in a Responsible Industry

By Dr Wilfried H. Hörner, Co–Chief Executive Officer, Argor-Heraeus SA

Production process of cast bars

The industry's commitment

In recent years, the precious metals sector has seen a considerable increase in standards and regulations aimed at creating and reinforcing conditions to ensure greater social responsibility by companies throughout the chain. National and supranational organisations have devoted major resources to guarantee the traceability of metals, the respect of human rights and the environment, and the prevention of practices such as money laundering and other violations.

The LBMA has developed the Responsible Gold Guidance (RGG), which is based on the Due Diligence Guidance for Responsible Supply Chain of Minerals published by the OECD in 2011. This is mandatory for Good Delivery refiners that want to be accredited by the London Bullion Market. Other key bodies operating in the precious metals chain, such as the World Gold Council and the Responsible Jewellery Council, are taking similar steps.

This has created a growing number of rules and requirements for large, well-organised companies as well as for small-scale operators. The industry initiatives referred to above support both large and small players with tools and instruments to help them achieve compliance (see the boxes below for details).

Thanks to this collective effort, also sustained by a commitment to harmonise standards, today's precious metals industry is even more responsible than it was just a few years ago.

Measuring gold thickness during the production process

This important development would have been impossible without the contribution of industry operators. For several years, Argor-Heraeus has been co-operating with the organisations that set standards in the precious metals field. On a regular basis, our directors and compliance team take part in international meetings, conferences, visits and workshops. The contribution of our expertise helps improve the definition of guidelines, requisites and inspection protocols that form the building blocks of a precious metals industry that is more sustainable along the entire chain. Such effort must refer to all operators, including especially those that present greater potential risk due to their size or the geopolitical context in which they operate. Our commitment to working in a more responsible industry involves a significant allocation of resources: we have calculated that Argor-Heraeus invests almost 600 man days per year just checking the reliability of our partners. Although this demands a major effort, we are convinced that as a major player with a long tradition in the industry, it is our duty to offer know-how and resources that assist the industry to move towards a model that merges cost-effectiveness with responsibility.

The Company as a Citizen

Our commitment to responsibility does not end with our contribution to the industry or chain. For many years, Argor-Heraeus has firmly believed that a company must be aware of its role as a 'citizen' in the socio-economic context in which it operates. We strongly believe that being a 'good citizen' is a fundamental condition for long-term success. Our management devotes considerable resources to imposing strict internal procedures that monitor and reduce the overall impact of our activities, often going beyond legal and regulatory requirements. We also make similar efforts to ensure that all of our employees develop an approach based on sustainability and ethical behaviour. This is guaranteed by a Code of Conduct, internal compliance policies, numerous certifications, as well as many hours of employee training courses.

The roof of Argor-Heraeus's headquarters in Mendrisio, one of the region's largest photovoltaic plants

Well aware of our Company's role in society, many of our initiatives are not linked exclusively to our core business. For example, we have installed one of the region's largest photovoltaic plants on the roof of our Swiss headquarters, as well as creating a mobility programme (which received the '2013 Mobility' award from the City of Mendrisio) to encourage our employees to use public transportation or to car-share, and last but not least, we co-operate with the University of Applied Sciences and Arts of Southern Switzerland (SUPSI) by awarding a prize to the student with the year's best diploma.

For the past five years, we have published our Sustainability Report (on www.argor.com), providing a tool for internal control and a stimulus for continuous improvement of our environmental, social and economic commitment.

Dr Wilfried H. Hörner, Co–Chief Executive Officer, Argor-Heraeus SA

Dr Wilfried H. Hörner completed his doctoral thesis in Chemistry in 1979 at the Julius Echter University of Würzburg in Chemistry, specialising in the sector of environmental protection (waste gas desulfurisation). Subsequently he was appointed as Head of Research and Development Precious Metal Refining and Products of W. C. Heraeus GmbH, Germany, until 1983. He then became Vice President & Technical Director to Heraeus Ltd. Hong Kong until 1987, before being appointed as Sales Manager World (Chemicals & Refining) of W. C. Heraeus GmbH, Germany. In 1988 he moved to Argor-Heraeus SA, Switzerland as Technical Director a position held until 1999, before becoming Associate & Director of Argor-Heraeus SA with responsibility for marketing and technical management. Since 2013 he has held the position of co–CEO of Argor-Heraeus SA.

He has actively cooperated for many years in a number of internal and external responsible sourcing initiatives and forums and is a member of the Standard Committee and Member of the Board of Directors of the Responsible Jewellery Council.

LBMA Best Practice Toolkit – Co-operating for better traceability

The LBMA has recently issued the 'LBMA Best Practice Toolkit', designed to make it easier for refiners to manage due diligence procedures for their value chain, in conformity with the standards required by the LBMA Responsible Gold Guidance (RGG), for gold coming from mines as well as from scrap and other sources.

The toolkit, comprising a set of questionnaires, checklists and evaluation sheets, was conceived to help not only refiners, but other industry players as well, with the clear goal of creating greater security and consistency in due diligence procedures. For example, a mine or bank that wants to process its gold at an LBMA Good Delivery refiner can use the questionnaire to prepare all of the documentation required for the internal evaluation of the customer and/or the transaction. Likewise, other operators in the value chain that want to carry out a due diligence procedure – regardless of their size and experience – can also use the toolkit. The toolkit can also help auditors interpret the LBMA RGG and evaluate the refiner's proper application of diligence obligations with respect to these standards.

The toolkit, created in collaboration with the LBMA by Argor-Heraeus, PAMP and Metalor, Switzerland's three largest refiners, is a good example of how co-operation among specialists can serve as a stimulus for developing a more responsible precious metals industry. Starting in August 2013, these three companies worked together for more than a year, providing their extensive know-how in due diligence to develop a unique toolkit that helps provide guidance and assistance to the entire industry.

The toolkit is available on the LMBA website: http://www.lbma.org.uk/responsible-gold

A tangible effort to help artisanal and small-scale mines enter international markets

Artisanal and small-scale mines are one of the most delicate links in the precious metals value chain, because they are small mines that sometimes operate without authorisation and/or without adequate machinery and technology. They are found primarily in developing nations, where a great number of people depend on them directly or indirectly. The most critical aspect of their operation is the protection of workers and the environment.

Moreover, these mines are often excluded from the official precious metals market, which for years has been imposing increasingly strict standards, rules and procedures. Mines that are unable to comply with these standards are barred from the official market, with all of the potential consequences that may result.

Therefore, in recent years, a series of initiatives have been launched to help artisanal and small-scale mines comply with standards for the traceability of materials and for work/environmental conditions, so that they may satisfy requirements for selling mined metals on official markets. These initiatives include the Swiss Better Gold Initiative, the Max Havelaar 'Fair Trade Gold' initiative and the 'Fairmined Standard v. 2.0' initiative of the Association for Responsible Mining (recently recognised as a valid standard for the RJC Chain-of-Custody certification).

Argor-Heraeus actively promotes these initiatives: for example, it is one of the main supporters of the Swiss Better Gold Initiative, a founding member of the Swiss Better Gold Association, and participates in the launch of analogous projects both in Switzerland and internationally. Recently, such initiatives have started to deliver the first results. For instance, the Peruvian mine Sotrami is now producing certified gold and is able to sell it internationally with the support of these initiatives, with another mine from the same country, Macdesa, about to become certified.

Review of the LBMA Assaying and Refining Conference

By Stewart Murray, LBMA Good Delivery Consultant

The LBMA Assaying and Refining Conference was held at the Millennium Hotel in Grosvenor Square in London's Mayfair from 8 to 11 March 2015. This, the sixth event in the series, which has been held in London every two years since 2005, is reviewed by the LBMA's Good Delivery Consultant, Stewart Murray, who also chairs the LBMA Referees group, which is primarily responsible for the development of the Conference programme.

1. Background and History

Although referred to as the Sixth Assaying and Refining Conference, the previous events in the series were known as 'Seminars'. During its review of the 2013 event, the Organising Committee felt that the term 'Conference' was justified by the greatly increased scope of the programme, the diverse and increasing participation, and the optional events on the final day.

The origin of the conference was the LBMA's Assaying Seminar, which took place in Armourers Hall in June 2005, in the wake of the introduction of Proactive Monitoring the previous year. Apart from a number of invited speakers, participation at that first event was limited to representatives of Good Delivery refiners and LBMA members. The aim was to facilitate the maintenance and, where appropriate, the improvement in the accuracy and precision of assaying and analytical techniques used in the precious metals industry. But perhaps of equal importance was the opportunity that the seminar provided for technical experts from around the world to meet and exchange ideas.

From 2007 onwards, the term 'Refining' was added to the event name, reflecting the fact that part of the programme was devoted to issues such as bar production and quality.

It is notable that two of the LBMA's most important developments in the technical area in recent years (the production of gold and silver reference materials and the Proficiency Testing scheme for gold assayers) both stemmed from discussions at the seminars.

2. Organising Committee

The LBMA is very pleased to acknowledge the work of the Organising Committee, which comprises representatives of the referees group:
Argor Heraeus – Alessandro Ruffoni
Metalor – Jonathan Jodry
PAMP – Umberto Magro
Rand Refinery – Madeleine Theron
Tanaka – Hitoshi Kosai

In addition, Mike Hinds of the Royal Canadian Mint, who also chairs the Reference Materials Steering Committee.

3. Attendance

As was the case for the last two events, the number of registered delegates in 2015, at 184, reached a new record. This is more than double the attendance of the early events in the series. Although the delegate list continues to be dominated by representatives of Good Delivery refiners, the LBMA has opened up participation in recent years and it was notable that a much wider range of organisations was represented at this year's event. The number was swelled this year by refiners that are seeking accreditation and by representatives of equipment manufacturers, a number of which also had a booth in the exhibitor area. In addition, for the first time, a significant number of central banks and related institutions were represented, no doubt reflecting the interest of the official sector in ensuring the quality of its gold reserves, in terms of both the precious metal content and the physical quality of the bars being held.

4. Programme and Presentations

The first day commenced, as in all previous events, with a welcome from the Chief Executive and an update on LBMA technical activities. The rest of the day was devoted to assaying and analytical techniques. On the second day, the morning sessions focused on bar integrity and in the afternoon, the final two sessions of the conference addressed practical issues and dealing with uncertainty. Each day ended with a short panel session, which allowed questions from the floor to be discussed.

All the presentations can be downloaded as PDFs from the LBMA website, so the descriptions in the table to the right are limited to a series of 'tweets' describing their contributions.

5. Optional Events

On the morning of Wednesday, 11 March, four optional extras were on offer. These included three visits (to the laboratories of the Inspectorate International in Witham, the London Assay Office and the Royal Institution – the historical home of science in London) and a workshop on X-ray fluorescence spectroscopy led by Mike Hinds. The LBMA is most grateful to all of them for extending their hospitality to our delegates and, in the case of Mike Hinds, for the huge amount of preparation that went into his workshop. It was most gratifying that the workshop and the visits to the Assay Office and Witham were completely sold out.

6. Networking

From the first event back in 2005, it has always been clear that participants find the networking opportunities at the LBMA seminars to be particularly valuable. There is simply no other event that offers the chance for precious metals assayers and analysts to meet their peers from other companies and countries. From the welcome reception on the Sunday evening until the informal lunches following the optional events on the Wednesday, there was a constant exchange of business cards and ideas. With hindsight, given the numbers that were staying over until the Wednesday, it might have been a good idea to organise some kind of informal get-together in a local hostelry for those who wanted even more.

7. Sponsors and Exhibitors

The LBMA would also like to offer a word of thanks to the sponsors and exhibitors. The Monday and Tuesday lunches were sponsored by IKOI and the conference dinner on the Monday was sponsored jointly by the LBMA's five referees (listed above).

The exhibitors' stands from the following companies were located in the area used for the coffee breaks.

- Agilent
- Alex Stewart International
- Allocated Bullion Solutions Pte Ltd

- Ametek – Spectro Analytical Instruments UK Ltd
- Fischer Instrumentation

8. Feedback

As usual after an LBMA event, delegates were invited to provide feedback, via an online poll, on the programme, the speakers, the venue and the networking opportunities. A slightly disappointing number of 38 replies were received and the various detailed comments and suggestions will be reviewed by the Conference Committee (anonymously of course).

The feedback can be summarised as follows:

- Just over half the respondents thought the conference to be 'excellent' overall: the remainder considered it to have been 'good'.
- In terms of value for money, opinions were more divided. A small minority (16%) thought that this was only 'adequate'. Just over half of the respondents thought it was 'good' and a quarter thought it 'excellent'. But at least no one ticked 'poor'!
- Looking ahead to the next conference, there was a balance between those who felt that it was time to choose a different location and those who felt that London still has much to offer.

9. Next Event

The next Assaying and Refining Conference will take place in March 2017. In her closing remarks, the LBMA Chief Executive, Ruth Crowell, noted that UK locations other than London could be considered as long as they had good flight connections and facilities.

The Conference Committee will shortly be meeting to discuss many aspects of the next conference. Suggestions from *Alchemist* readers are always welcome and should be addressed to ruth.crowell@LBMA.org.uk.

Presentation	Description
Session 1: Introduction	
The LBMA Good Delivery System – Recent and Future Developments by Stewart Murray, LBMA Good Delivery Consultant	Recent history (and geography) of Good Delivery List accreditations and refined production. Development of the Rules on applications and bar quality.
LBMA Reference Materials – AuRM3 and Beyond by Mike Hinds, Royal Canadian Mint	AuRM3 timeline: specifications, manufacture, homogeneity checks, multi-lab analysis and certification. Request for feedback on the next RM.
LBMA Proficiency Testing Scheme by Jonathan Jodry, Metalor Technologies SA	PT fundamentals and value. Sample manufacture for PTS 2015. Review of results for Good Delivery refiners and others. Comparison with earlier schemes.
Session 2: Assaying	
Fire Assay Round Robin Organised by the Japan Mint by Satomi Tabuchi, Japan Mint	Importance of fire assay for the 10 Japanese Good Delivery gold refiners. Parameters and results for the 2014 Round Robin exercise using LBMA samples.
Some Observations on the Use of Fire Assay for Gold by Dippal Manchanda, Birmingham Assay Office	Understanding fire assay technically. Optimum silver and copper additions. Balance accuracy. Modified formula if samples contain pgms.
Use of XRF for Hallmarking at the London Assay Office by Chris Walne, London Assay Office	Items tested. Effect of parameters on precision (beam size, counting time, positioning). Different counters. Standards and uncertainties.
Session 3: Analytical Methods	
Analysis of Gold 995-999.9‰ Using MP-AES by Jean-Pascal Bourgeois, University of Applied Sciences, Fribourg	Use of microwave plasma atomic emission spectroscopy for analysis of 995+ gold. Detection limits and improved linearity versus ICP OES.
Analysis of Gold 995-999.9‰ Using Spark-OES by Madeleine Theron, Rand Refinery	Benefits (reliability, detection limits, precision, speed) and limitations of spark OES analysis in comparison with other methods.
Analysis of Gold 995-999.9‰ Containing Large Amounts of Copper by Daniela Manara, PAMP	Influence of varying amounts of copper in Good Delivery gold alloys on the accuracy of determination of fineness by fire assay.
Session 4: Reference Materials and Other Analytical Methods	
Comparative Study of Silver Bullion Analysis by Robert Lawrence, Johnson Matthey Canada	Benefits and limitations of fire assay versus automatic titration for the analysis of silver raw materials from mine and scrap sources.
Manufacture of LBMA Reference Materials by Krastsvetmet by Elizbar Aliev and Irina Khobyakova, Krastsvetmet	Detailed procedures followed during the manufacture, homogeneity testing, analysis and certification of the AuRM3 reference material.
LPPM Reference Materials for Platinum and Palladium by Hiroshi Sawai, Tanaka Kikinzoku	Update on the production of Pt and Pd reference materials for the LPPM (target concentrations, manufacture, homogeneity check and analysis).
Session 5: Bar Integrity Chairman Stewart Murray	
Analyses of the Chemical and Structural Integrity of Gold Bullion Bars by Eddy Current Probes, by Quentin Bochud and Daniel Sutter, Metalor and Helmut-Fischer	Possible applications of phase-sensitive eddy current equipment for investigating and highlighting problems in gold bullion products.
Examination of Gold & Silver Bars and Coins by Resonant Ultrasound Spectroscopy by George Rhodes,	Description of resonant ultrasound spectroscopy and its possible applications to the testing of suspect gold and silver bars and coins.
Different Approaches to the Use of Ultrasonics in London Vaults by Neil Harby, LBMA Good Delivery Officer	Principles and practical considerations in the use of ultrasonic testing equipment for investigating suspect bars in the London vaults.
How the Battle against Counterfeiting in the Coin Industry has driven Innovation by David Janczewski, Royal Mint	Historic battles with coin counterfeiters. Current overt and covert security features. Innovative new security in the 2017 pound coins.
Study of Elemental Fingerprinting of Gold Doré using Glow Discharge – Mass Spectrometry by Mike Hinds, Royal Canadian Mint	Requirements for the possible use of marker elements to fingerprint gold bullion and their detection using glow discharge mass spectrometry.
The Visual Guide to What Is and Isn't Acceptable in London by Stewart Murray, LBMA Good Delivery Consultant	Evolution of the Good Delivery rules on bar quality. Contents of the 2008 pdf Guide. Purpose and publication of the forthcoming website-based Guide.
Session 6: Practical Issues	
Precious Metal Logistics and the Value Chain by Tony Evanson, Brink's	Challenges in moving precious metals from mine, by land or air - via Customs - to refinery or fabricating plant and the ultimate customer.
Acidless Separation Technology for Refining Gold by Federico Padrono Martini, IKOI	Principles of the technique and practical procedures. Positioning versus other technologies. Suitability for various raw materials.
Assaying and Analysis Choices in Practice by Dirk Hofmans, Umicore	Analysis and comparison of information provided by Good Delivery labs on the use of direct versus indirect methods for gold proficiency testing.
Session 7: Dealing with Uncertainty	
The Smallest Things Can Often Create the Biggest Problems – Why Sampling Matters by Kevin Tucker, Inspectorate International	The challenge and financial importance of ideal sampling of precious metals containing materials ranging from ores to end of life materials.
Fire Assay Splitting Limits by Jon Forrest, Royal Canadian Mint	Reasons for and implications of the trend towards lower splitting limits. Use of umpires. Calculation of appropriate splitting limits.
Uncertainty and Fineness Marking of Bars by Alessandro Ruffoni, Argor-Heraeus	Requirements for the production, assaying and quality control systems to ensure the

LBMA Proficiency Testing Scheme

By Jonathan J. Jodry, Head of Laboratories, Metalor Technologies SA

The results of the fourth edition of the LBMA gold (>995‰) proficiency testing have been released. This paper, presented at the LBMA 2015 Assaying and Refining Conference in London on 9 March, details how samples are prepared, what results were obtained and what can be learned from the exercise.

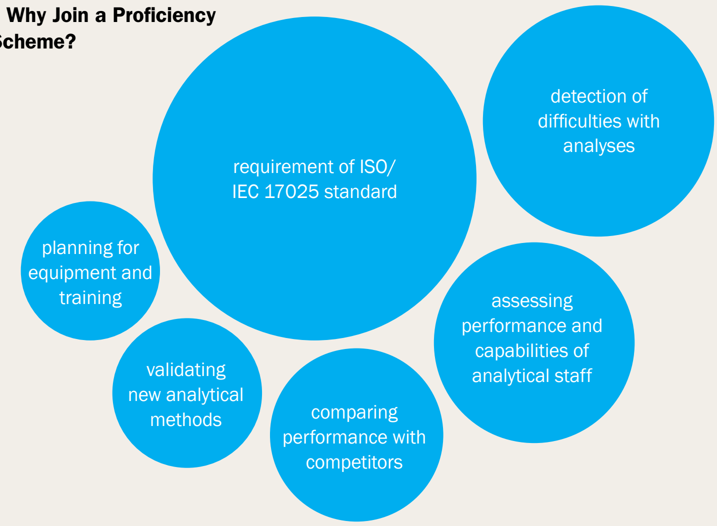
I. Introduction

In the precious metal industry, laboratory staff are extremely important people. If they don't do their job properly, there is a huge risk for the company, which can take the form of lost metal, compliance problems or reputation issues. There are many tools allowing laboratories – and management – to control the quality of analyses performed, and one of those is proficiency testing (also called round robin). In 2012, the LBMA launched its own annual Proficiency Testing (PT) scheme, and the results of the fourth scheme were released just a couple of weeks ago.

Why join a Proficiency Testing scheme?

There are many reasons to join a proficiency testing scheme (see chart 1). For laboratories, the most frequently cited reason is that such participation is a requirement of ISO 17025, as this accreditation requires all laboratories to perform inter-laboratory testing on their accredited methods.

Chart 1: Why Join a Proficiency Testing Scheme?



There are, however, other attractive reasons.

- Issues on analyses can potentially be detected. While most laboratories believe they provide the best analyses in the market, it is not always the case. Pinpointing specific problems can be complex; proficiency testing can provide such information, especially when a scheme is joined for several years in a row.
- Assessment of the performance and capability of the analytical staff can be performed. This is crucial not only for the lab manager, but for the management of the company: both enjoy the assurance that the analytical job is performed properly. A PT organised by a third-party organisation is usually trustful.
- Comparison of a laboratory's performance with a large number of competitors can be done only through participation in such a scheme.
- Validation of new analytical methods is often complex. Over the last four years, we have seen many laboratories starting to rely heavily on spectroscopic methods, while fire assay was the reference method in 2012. It is likely that some spectroscopic methods were validated in-house with the use of the LBMA PT.
- Equipment change and training can be justified. Obtaining budget for buying a new ICP-OES is not always easy nowadays, but PT results can help justify such an investment.

There are several proficiency testing schemes for precious metals organised outside the LBMA:

- The major one is a scheme organised by ASTM (the American standard organisation), which organises four PTs every year with a carat-gold sample ranging typically from 200 to 950‰.
- The International Association of Assay Offices (IAAO) has a set of proficiency testings on jewellery-grade gold, silver, platinum and palladium, which are unfortunately not open to the public for the time being.
- Other proficiency testing schemes are organised in Spain by FELAB, and by companies and associations focusing on geographically limited areas.

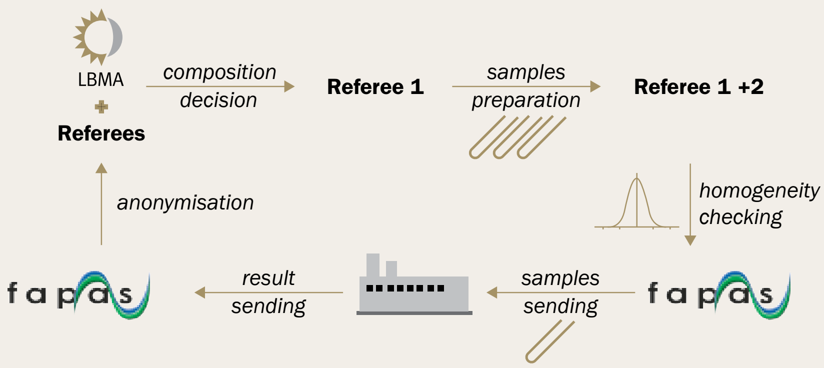
However, only the LBMA is proposing proficiency testing for high-purity gold of 995‰ and higher.

II. Sample Composition and Preparation

The LBMA wants to ensure that a significant variety of compositions is proposed for the proficiency testings, covering purity of between 995 and 999.9‰, and corresponding to 'real-life' materials. This means that binary samples containing only gold and silver as an impurity are not attractive, and nor are materials with exotic elements. The idea is rather to have samples that could correspond to what is obtained at a refinery. Importantly, all samples are specifically prepared for the proficiency testing, which is a requirement to get an appropriate homogeneity.

The procedure starts with the LBMA and the referees deciding on a specific composition (see chart 2). One referee will prepare the samples, analyse them and provide data on homogeneity to the LBMA. In parallel, a second referee will

Chart 2: Preparation of Samples



independently test the homogeneity. This double verification is very important: samples that are not rigorously homogeneous would be of no use for the scheme. Samples are then sent to FAPAS, which in turn sends the samples to the laboratories. Once the samples have been analysed, the results are sent back to FAPAS, which will anonymise them and forward them to the LBMA and the referees.

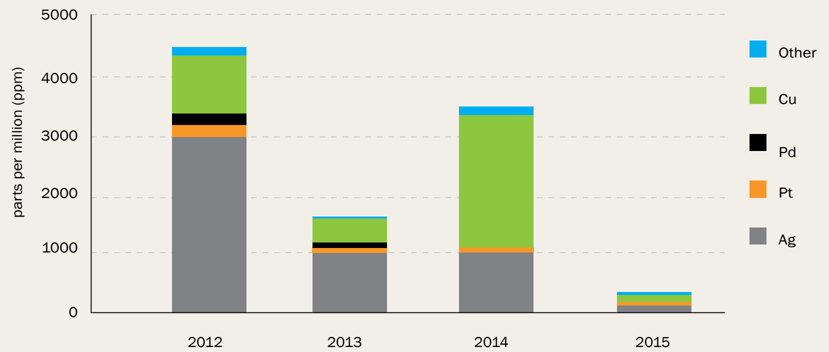
Again, note that neither the LBMA nor the referees know which result was provided by any given company, so the PT is really a tool to control each laboratory's own ability. While the LBMA cannot monitor each refiner's performance, PT gives information on how the market is doing and indicates, sometimes, that the results are not as precise as we all would like them to be.

Chart 3 shows the composition of the four samples analysed between 2012 and 2015, with the bars representing the amount of impurities (in ppm, part per million). In 2012, we had a 995.4‰ sample, with mostly silver and some copper as impurities. The following year, the sample contained fewer impurities. In 2014, we focused on a slightly unusual 997‰ sample with more copper than silver – something we see more and more in the market. And this year, we had a sample with a very low impurity level, above 999.5‰. Apart from the main elements – silver, platinum, palladium and copper – we have always had a couple of extra elements, and the list is open to change in the future.

The central data obtained from any proficiency testing is the Z-score (should you remember only one piece of information for your result, it should be that number). It is defined from two factors: the target value, which is the average of all valid results given by laboratories; and the acceptable standard deviation, fixed at 0.049‰. This value was calculated from assays performed for the LBMA over 10 years and fixes the precision we want to achieve. Since the target value is an average of averages, rather than a number defined by the referees, the PT scheme is valid only if you have a large number of laboratories participating, typically more than 30.

- Laboratories want to achieve a Z-score of between -2 and 2: 85-95% of laboratories reached that important goal.
- A Z-score of between 2 and 3 (and between -2 and -3) is a little tricky. It means that it is not possible to say whether the laboratory has a bias or not: the result is borderline. Laboratories within those zones should consider the result as a warning and carefully check whether there is a potential problem. Most importantly, they should join the next proficiency testing either to corroborate this bias or to confirm that there was no error.
- Z-scores above 3 and below -3 are seriously concerning and mean that from the statistical point of view, the laboratory is outside the range it should be in. Until last year, we always had one lab outside the range; this year, we had two.

Chart 3: Composition of PT Samples 2012-2015

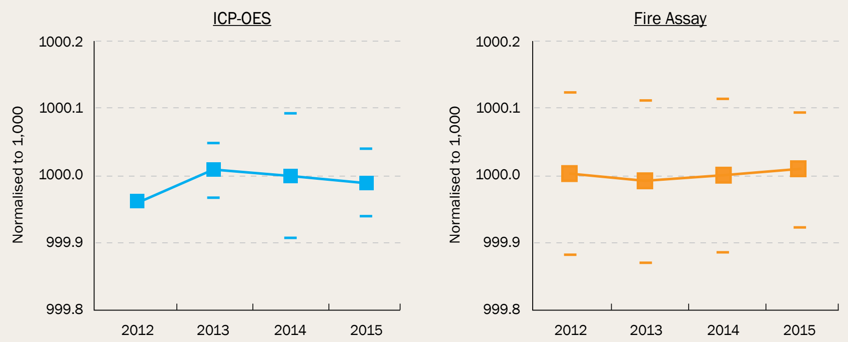


III. Participation and Results

Participation was stable for the first three years, with about 40 labs joining, while this year we have seen a sharp increase, with 49 Good Delivery laboratories as well as 10 non-Good Delivery companies participating. This is the first time the LBMA has opened the scheme to non-Good Delivery companies, which could be supervisors, assay offices or silver Good Delivery companies interested in assessing their gold analytical abilities.

The results have been processed independently – 49 results from the Good Delivery labs and 10 other results – since we wanted to check whether any bias was observable between the two groups.

Chart 4: PT Accuracy and Precision 2012-2015 (results normalised to 1,000)



IV. Analytical Method

Historically, the method of choice was fire assay (cupellation). Since 2012, when all but six labs were using fire assay, we have seen more and more results obtained by spectroscopic analyses. The most common method is ICP-OES, but this year, we have seen some results by SPARK-OES and ARC-OES, as well as by atomic absorption spectroscopy (the latter was only used however to determine a single impurity).

> *“The use of SPARK-OES was both surprising and exciting. SPARK ablation is a fantastic technique, because it is extremely stable.”*

Spectroscopic methods that we have not seen yet are MP-AES, using a plasma generated by a microwave, and ICP-MS, whose usage has been developed by several companies but to the best of our knowledge has never been applied to qualify high-purity gold at PT.

The use of SPARK-OES was both surprising and exciting. SPARK ablation is a fantastic technique, because it is extremely stable. You can calibrate an instrument once and then just use setting-up samples (SUS) to correct the drift over several years. The problem is that, normally, you cannot analyse wires, because the instrument opening is too large. One of the labs came up with this original idea of transforming the wire to a flat surface and got a very precise result.

V. Accuracy and Precision

The main difference between spectroscopic analysis and fire assay is their respective precision, while accuracy is usually similar (see chart 4). The results from 2012-15 are normalised to 1,000 (the target value). All values are very close to 1,000, with no significant difference between ICP-OES and fire assay (the 2012 ICP-OES result is biased by the very small number of labs using that instrument).

Spectroscopic analysis is extremely powerful when samples contain a low amount of impurities. In 2014, with 3,000 ppm of impurities, the precisions of ICP-OES and fire assay were more or less identical. However, when we go to material with a higher purity, we see a significant difference between fire assay and spectroscopic analysis, with ICP-OES being much more precise.

Interestingly, we do not observe a significant variation between accredited and non-accredited laboratories using fire assay.

ICP-OES is an extremely powerful method for the determination of each specific impurity. In 2014, we measured a little over 1,000 ppm for silver, with a standard deviation of 39 ppm (4%). For copper, the standard deviation was about 5%. In 2015, the results were also interesting, with every single impurity – silver at about 2,000 ppm, and platinum, palladium and zinc at about 10 ppm – having a standard deviation of about 10%.

VI. 2015 Results

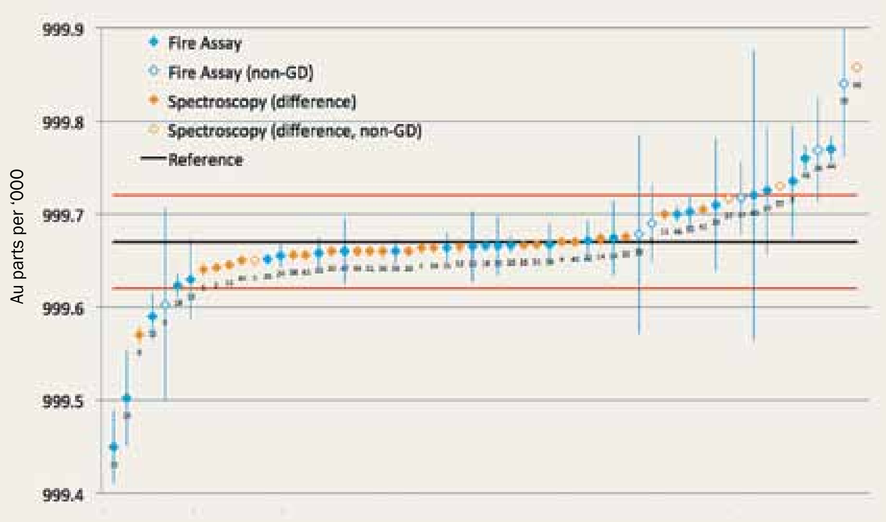
Chart 5 shows all the results from accredited and non-accredited laboratories, as well as the LBMA accepted deviation (as illustrated by the red lines). During an application, 999.5‰ gold has to be provided to the LBMA with an accuracy of 50 ppm, which means that every result above or below this level would have been classified as a failure. Two labs not on the Good Delivery List announced a far too high purity for the sample (above 999.8‰). At the same time, other accredited laboratories delivered results that were extremely far from the expected value. Any laboratory with an abnormal result really needs to take action and to seek advice to fix the issue. It could mean that a systematic bias is taking place at the company, which could potentially lead to a large loss of money.

In terms of method used, spectroscopic analysis, with one exception, was much better than fire assay in terms of accuracy. Specifically for gold above 999.5‰, spectroscopic methods are usually much more robust. The 2015 PT was a high-purity sample, and it thus does not mean a similar effect will be observed next year.

"Any laboratory with an abnormal result really needs to take action and to seek advice to fix the issue."

A recurrent problem with this is that laboratories tend to overestimate the precision of their method. For each lab, the standard deviation is represented by vertical lines which should cross the target value. This however is not the case for most laboratories. A possible reason could be that the highest and lowest replicas are removed from the list of results, which often does not change the average, but does seriously diminish the uncertainty and gives a false sense of safety.

Chart 5: 2015 PT Results



VII. Conclusion

It was great to have so many participants this year, including 10 non-Good Delivery laboratories. The more participants we have, the more statistics we can produce. In the past, it was not easy to compare fire assay with spectroscopic results, simply because there were not enough ICP-OES analyses.

Slightly concerning, we still have relatively poor results from several ISO 17025 accredited laboratories, as well as from non-Good Delivery laboratories. We hope that the labs concerned will promptly resolve their problems.

In terms of the future of LBMA proficiency testing, we can expect the scheme to continue for a long time, with compositions of between 995 and 999.5‰ being provided.

We are hoping to see more and more improvement on the spectroscopic methods side, especially in the range of 995‰ gold, where those methods can sometimes be challenging. We also wish to see an increased participation of non-Good Delivery laboratories. To be fair, for those laboratories, it was the opportunity to join the scheme: they are likely to perform better in the following years, perhaps by selecting who should do the analyses and how many replicas should be performed.

Newer methods are available, including MP-AES and ICP-MS; we have not seen results provided by such instruments during previous PTs, but this could change rapidly.

An obvious extension of the LBMA proficiency testing would be on silver. The LBMA might decide to start such scheme in the future, which would be very beneficial for companies on the silver Good Delivery list.

Jonathan J. Jodry got his PhD at the University of Geneva in 2000 in organic and supramolecular chemistry; he then spent 8 years in Japan, first as a JSPS post-doctoral fellow at the Tokyo Institute of Technology, and subsequently as a senior researcher at Central Glass, a Japanese company that specialises in fluorine chemistry. Returning to Switzerland in 2009, he joined Metalor Technologies as the trace analysis laboratory manager, and later became Head of laboratories. Collaborating with the company's other laboratories in America and Asia, he represents Metalor Technologies as a referee at both the LBMA and the LPPM, is an expert for several ISO and CEN standardisation technical committees, and is an officer and board member of the newly founded Europe Chapter of the IPMI.




LBMA Annual Party 2015

By Aelred Connelly, Public Relations Officer, LBMA

The LBMA's Annual Party was held this year at the All Stars Bowling Lane on Thursday, 26 February. The theme of the party was 1950s – Rock and Roll. More than 200 Members and Associates attended the event. The main source of entertainment for the evening was a ten-pin bowling competition in which more than 20 teams competed for the prestigious title of 'LBMA Bowling Champions, 2015'. In a closely contested final, CME won in a hard-fought final against G4S. The photo (see photo above second from the left) shows the winning team with their medals, which were awarded to them by Ruth Crowell, Chief Executive of the LBMA. Congratulations should also be extended to Scott Stillitoe (Prebon Premex) for achieving the highest score on the night with 101. Further entertainment included Wii games and karaoke. Despite some lamentable singing, great fun was had by all.

Three prizes were awarded for the best dressed attendees. The winners (see photo below 3rd from the left) are shown in the photo holding their prize of a bottle of champagne. Pictured left to right are Claire Rosser (Brady), and Emma Dickerson and Emma Croft (both from Barclays). Congratulations to all three for making the effort to dress in authentic fashion.

The party provides an opportunity for staff of Members and Associates to network and socialise in a relaxed and informal atmosphere. The feedback from those who attended was very positive and a thoroughly enjoyable evening was had by all.




Neil Newitt: Another World…

By Dr Michelle Blagg, Research Associate at the Institute of Contemporary British History (ICBH)

Neil Newitt (far left) representing Sharps Pixley at the Gold Fixing in 1972

As part of her 'Voices Project' capturing, contextualising and explaining the London bullion market, Michele Blagg interviews Neil Newitt, one of the original signatories of the memorandum incorporating the founding of the LBMA in 1987.

A second career began for Neil in February 1968 when he joined Kleinwort Benson, having first joined the Royal Navy at 16, serving 11 years working his way through the ranks from Writer, Leading Writer and then Petty Officer Writer, before qualifying as an Officer. Married with three small children, he wanted to spend more time at home. Unfortunately, he would wait another 30 years before his plan worked out. During his time working in the bullion markets, he spent years on aeroplanes, away much more than if he had stayed in the Navy, where he was guaranteed a monthly salary and a job until he was 40, before retiring with a good pension. It was a gamble to turn his back on this security and an annual salary of £1,200.

The first bank to offer Neil a position was Lloyds, offering a disappointing salary of £800. However, a contact in the wardroom mess said "I know somebody who works in the City", Neil recalls. "This Colonel somebody or other, a real blimpy type, kept nagging and nagging me, because he knew I wanted to leave and he said 'Why don't you try and go to this bank?', which was Kleinwort Benson,"[1] which offered him a job with a salary of £1,200.

The role was very basic in the Documentary Credits Department, which Neil referred to as "not the world's most exciting job". Then, in March 1968,[2] as chaos broke out in the gold market, his manager said: "You are only a trainee, you aren't doing anything important here, so we are going to second you to a subsidiary company we have. They are under a great deal of pressure and we have agreed to lend you to them for a month or so." Not quite sure what to expect, he turned up the next Monday at the offices of Sharps Pixley:

"I didn't know who they were, but I found out they were one of the members of the London gold market, the Fixing, and I was introduced to the Managing Director, Stewart Pixley, the great, great grandson of the founder of the company … There were tons of gold bars coming in from New York – around 1,000 tons in that week alone. The only way that they could ship it was to send it from the US Federal Reserve in New York in huge US Air Force planes that went to Stansted Airport, and Brinks would collect it and deliver it to the Bank of England, where the five bullion dealers would buy it from the Gold Pool."

Brinks would then take the gold from the Bank of England and deliver it into the huge bullion vault in Finsbury Square operated by Sharps Pixley. Neil remembers his horror and how miffed he felt when he was given a pair of overalls and a pair of thick canvas gloves, and was told he would have to weigh all this gold. It was a huge job! "This isn't what my new career led me to believe would happen," he thought. As the flow of gold abated, he moved across to the main office, temporarily acting as Office Manager and covering for an ill colleague. On his return, Neil hoped to resume his "lovely posh" merchant banking career at Kleinwort Benson, but when he tried to move back, Stewart Pixley said: "No, we don't want you to go back. We would like you to stay but not as a porter. How would you like to come into the dealing room?" It sounded interesting, so Neil stayed for the next 14 years.

Dealing rooms then were nothing like nowadays. Neil described his working environment as "very basic. The only outside means of communication were telephones and telex – no computers, no fancy gadgetry at all. You just picked up the phone or people from all over the world would telex, and you would make a price and off you would go."

> *"no computers, no fancy gadgetry at all. You just picked up the phone or people from all over the world would telex, and you would make a price and off you would go."*

Things began to change after the 1974 US Government liberalised[3] the holding of gold. Since 1933, American citizens had been prohibited from owning gold. This move opened up a whole new trading area. Witnessing the opening of the market and the advance in technology, Neil noted that:

"The Commodity Exchange started offering contracts and Reuters came up with this

1 Kleinwort Benson acquired Sharps Pixley in 1966, which increased the range of services the bank could offer clients, as it decided to link gold bullion to foreign exchange trading.

2 In 1961, the Central Banks Gold Pool, operated by the Bank of England, was formed to stabilise the price of gold at around $35 an ounce. In January/February 1968, there was speculative fever that the US would abandon the Gold Pool and suspend convertibility of the dollar into gold. Rising gold demand, falling US gold reserves and losses from the Gold Pool reaching $400 million on Thursday 14 March persuaded the Bank of England to close the London Gold Market the next day, which remained closed for two weeks. When the market reopened on the 1 April 1968 to revised instructions from the Bank of England, the gold dealers announced that the London gold price would from now on be quoted in US dollars and that they would waive commission charges on gold purchases, while imposing a charge of a quarter of a percent on gold sales (for further detail, see: Rae Weston, Gold, A World Survey [1983], pp.14-15).

3 Between 1933 and 1974, it was illegal for US citizens to own gold in the form of gold bullion, without special licence. On 1 January 1975, these restrictions were lifted and gold could be freely held in the US without any licensing or restrictions imposed.

fantastic technology. It was a bit like a calculating machine with buttons that you pressed and at the end there was a rectangle with three orange neon circular bulbs, and we thought this was fantastic! All you had were three of these things, each showing a different digit. To make it even more difficult, it only showed the last three digits of whatever it was … you had to know that you had put it on the gold button and not the silver button, or the cocoa, or whatever. We thought this was a great advantage, so it helped a little bit."

The dealing room at Sharps Pixley had two of the Reuters machines. Another thing that Neil pointed out, which he thought most modern dealers would find incredulous, was that at the end of the day, he would send a telex to his customers in Hong Kong, offering them a sale price for 9999 kilo bars, and another to Dubai offering a sale price for 995 tola bars, which they liked, and the price would be good until they got back in the next morning. There were no other markets open to his customers through the night and he would find out if he had sold 100-kilo bars in Hong Kong or so many 10-tola bars in Dubai. The dealers would then think about their position, because they had sold the gold and may not have had it in their book yet, so they would have to decide whether they covered it, or left it. Neil observed that at that point in time it worked, but it wouldn't now because "positions change from minute to minute and you have got to be completely on the ball".

The dealing room at Sharps Pixley circa 1982

Dubai was an emerging market for Sharps Pixley, although the market had long been synonymous with the unofficial export of gold and silver to the Indian subcontinent. On one visit, Neil recalled the huge dhows that went cracking out of the small creek across the sea and, with the right bribes, would by-pass the Indian Customs. The profit margins made the risk of being caught worthwhile. This soon changed as markets became more international. In 1974, following the legalisation of gold imports in Hong Kong,[4] Neil and his family were posted overseas to Hong Kong, where he was asked to establish an office for Sharps Pixley. He learnt the language and was soon quoting gold and silver in Cantonese. It was a difficult language to learn and he fondly remembered how he "loved that the Hong Kong Chinese were absolutely wonderful and quite often I would be the only gweilo (foreign devil) at dinner with the local gold dealers at the restaurant. The one thing that I learnt for sure was never ask what you are eating, just eat it – much better if you don't know."

"Tempers flared and people would throw phones and kick things. The market eventually calmed down. Then not long after, Neil received an offer to join Goldman Sachs."

Contact between the Hong Kong and London offices took place daily, because most transactions carried out were loco London, which the office would process. Occasionally, one of the London team would go out to Hong Kong for meetings. The posting lasted for three years. Neil headed back to the London dealing room via an adventurous trip on the Trans-Siberian Railway,[5] just in time to witness the market get crazier and crazier as the price of gold rose sharply from December 1979. Speaking of this eventful period, Neil described how:

"At the end of December, gold was around $400 or thereabouts, the 21 January 1980 saw a memorable Fixing of $850, two days later the pm Fixing was $650 and we were quoting $10 dealing spreads. Silver was being finagled by the Hunt brothers.[6] Silver on the 21 or 22 January fixed at $50 … It was quite unbelievable. I think by March gold had settled back down to around $450. Things began to cool off."

Before the age of computers, during this period, it was a very tense and stressful time in the dealing room trying to keep positions updated. Neil described the experience as "flying by the seat of our pants! You really didn't know what was going on, except every time you got a phone call, you probably had a problem."

Tempers flared and people would throw phones and kick things. The market eventually calmed down. Then not long after, Neil received an offer to join Goldman Sachs.

In the early 1980s, the American banks began getting really interested in having a presence in London. Neil received numerous calls from friends at J. Aron,[7] asking him to go and talk to them. He resisted, but eventually Dennis Susskind, a partner at Goldman Sachs and well known in the market, called him up and said: "Look, just come and have a talk with me." So Neil said "OK". He had to rush off to the local travel agents and book a business class ticket to New York for the Thursday overnight flight (this was long before on-line internet booking was available). His wife was concerned about the cost of the ticket, but he reassured her that it would be reimbursed. It was all hush hush. Taking a day's leave, Neil headed off to New York from Heathrow after work on Thursday evening. Landing on the Friday morning, he headed straight to the office, where he had the "toughest day" of his life. They really put him through the mill before he got the evening flight back to London. The following Wednesday, he received a call offering him a job. He shared with me that "there was a pay rise. The salary was very modest at Sharps Pixley and slightly less modest at Goldman Sachs. The days of big salaries were not around then." Having accepted the post, Neil asked that nothing be done until he was able to talk to his boss at the time, Jack Spall. Unfortunately, Jack beat him to it and the following day buzzed down and asked Neil to go

4 For many years, Hong Kong was a closed gold market, while its citizens could trade among themselves in tael bars, the British authorities banned direct gold imports into the colony. In 1974, free imports were again permitted (for further detail, see: Tim Green, *The New World of Gold* [1982], 145-154).

5 Neil made the journey with his son back to the UK via the Trans-Siberian Railway. At that time, you couldn't go from Hong Kong to Beijing, so they flew to Japan, took a ship from Yokohama to Vladivostok and then on to Nakhodka, where they took a train up to Khabarovsk, which then went all the way across Siberia, taking about eight days to cover 10,000 miles. The cost was about £200.

6 Nelson Bunker Hunt and his brother William had for some time been attempting to corner the market in silver. In 1979, the price jumped from $6 per troy ounce up to a record high of $48.70 per ounce. In January 1980, exchange rules regarding leverage changed, placing heavy restrictions on the purchase of commodities on margin. The Hunt brothers had borrowed heavily to finance their purchases and as the price began to fall, they were unable to meet their obligations, causing a panic in the markets (for further details, see: Stephen Fay, *The Great Silver Bubble* (1982).)

7 Goldman Sachs acquired J. Aron & Company in November 1981. J. Aron, a commodities trading firm, was merged with the Fixed Income division at Goldman Sachs and formed the Fixed Income, Currencies and Commodities division.

and have a word with him. Jack had received a phone call letting him know that the move was afoot. Things were smoothed out. Neil found it hard to leave Sharps Pixley behind, but off he went to what he describes as "another world".

Amazed by the quality, the intellectual capacity and the things that Goldman Sachs did, Neil was very impressed with his new working environment. His initial doubts about whether he could cope with the new working regime soon abated, as he split his time between sales and his forte, communicating with customers. Personalising relationships was the key to success during this time before the internet and email. Neil would pick up the phone and know his customers voices, which went down very well. As he pointed out, "a central bank can deal with any of 20 people, why should it deal with you? Because he knows you, you have been out for a meal and you are pretty good friends, and you know his family – that kind of relationship building."

Neil was one of four signatories on the original memorandum incorporating the founding of the London Bullion Market Association, signed on 27 November 1987. As the American banks – Goldman Sachs, J. P. Morgan, Citibank and others – had a greater presence and share of business in the London market, opening new offices, competition became fierce. The American banks were very competitive and were a serious threat to the dominant members of the Fixing, in which of course they were excluded from taking part. The main five Fixing brokers had good relationships with each other, socialising and communicating. Neil explained that having worked for one side and then the other, he was part of the team tasked to find a mutually satisfactory solution to the situation, so that old and new could work together. Despite some of the objections faced from a number of diehards – "Who needs these bloody foreigners?" and "It's our market!" – during meetings at the Bank of England, then the ultimate regulator of the bullion market, the solution reached was the foundation of the London Bullion Market Association, which brought the American banks under its aegis. Neil's recollection of events was that: "It was a satisfactory resolution ... Things didn't really change to start with. Various members from both sides came into the Committees ... There were some who, anxious to get in on the management, felt excluded by the stuffy old gold market members, [but on the whole] the dealers and traders and the other members got on well together."

> *"Amazed by the quality, the intellectual capacity and the things that Goldman Sachs did, Neil was very impressed with his new working environment. His initial doubts about whether he could cope with the new working regime soon abated"*

Neil's time working in the London market was one of the most interesting periods in its recent history – 1968 and 1980 were seismic! He participated in the Gold Fixing, dealt with many central banks and governments, lived in and travelled all over the world to many weird and wonderful places, and experienced some bizarre travel arrangements and hair-raising plane journeys. Neil retired in 1999, aged 60, but continued to travel. For a time, he set up and headed a Land Rover Charity driving across Europe delivering humanitarian aid to Bosnia-Herzegovina. As for his wife, who had had enough of never seeing him, he assured me that "she still quite likes me even now that I have been retired for 14 years!"

The photograph shows (left to right), Stewart Pixley, Neil Newitt, Walter Annenberg (US Ambassador to the UK from 1969) and Sir Cyril Kleinwort, analysing the Sharps Pixley coin collection.

In the 1970s, Sharps Pixley did a good trade in gold coins. Part of the UK gold reserves were in gold sovereigns, with coins coming in canvas bags containing 1,000 coins, made up of new and old coins. They were an unbelievable treasure trove and when the bags arrived in the dealing office, they would sort through them to pull all the numismatic coins out and replace them with ordinary sovereigns. The coins could be Victorians, right from the beginning of Victoria's reign, the Diamond Jubilee and the end of her reign, when she was depicted as a widow with veiled head. The Edwards were all the same, but in those days of colonial empire, sovereigns were minted in Pretoria, Ottawa, Delhi and Sydney (these were much rarer than the other sovereigns). Over the years, staff at Sharps Pixley compiled a collection containing every sovereign ever minted.

My thanks go to Neil for kindly agreeing to the release of the transcription of the recording made at the LBMA office on 13 May, 2014 for the Voices Project upon which this article has been based.

Dr Michele Blagg (BA, MA, PhD) is a visiting Research Associate at the Institute of Contemporary British History (ICBH) at King's College London. Michele is a Research Consultant for the LBMA, currently engaged on the oral history project 'Voices of the London Bullion Market'. As part of a collaborative doctoral award granted by the Arts and Humanities Research Council, she was based at the Rothschild Archive. Her doctoral research focused on the Royal Mint Refinery, operated by N M Rothschild & Sons between 1852 and 1968, and how it adapted to the changed London gold market.

Her areas of interest are in financial and business history with special regard for the actors and networks located in the London market.

She teaches on the MA in Contemporary British History and assists with the Witness Seminar Programme. She sits on the Business Archives Council Executive and is involved in the annual 'Meet the Archivists' workshop held in the City that aims to explore ways in which research students can identify and use business records in a variety of different research fields.

LBMA Certified Reference Materials

As part of our promotion of quality and good practice in the refining and trade of gold and silver, the LBMA produces and sells Gold and Silver Certified Reference Materials (CRMs). CRMs are available to any laboratories that would like to calibrate their analytical equipment using LBMA standards.

There are currently three gold CRMs and two silver CRMs available. AuRM1 and AuRM2 (available as a set only) are intended to be used for the validation of analytical methods for trace metallic impurities in gold, such as Spark optical emission spectrometry. AuRM3 is intended to be used for the validation of instrumental methods for determining the concentration of trace metallic impurities in gold, such as X-ray fluorescence and optical emission spectrometry, using spark or inductively coupled plasma. AgRM1 and AgRM2 are intended to be used for the validation of analytical methods for trace metallic impurities in silver, such as spark optical emission spectrometry. They can also be used in the calibration of analytical instruments.

The table below lists the elements for which certified values have been established with expanded uncertainty.

Please refer to the Good Delivery section of the LBMA website for further details or email gdl@lbma.org.uk.

Certified Elemental Concentrations (mg/kg)

Reference Material	Ag	Al	As	Au	Bi	Ca	Cd	Cr	Cu	Fe	In	Ir	Mg	Mn	Ni	Pb	Pd	Pt	Rh	Sb	Se	Si	Sn	Te	Ti	Zn
LBMA AuRM1	20.0	9.6	14.5	x	30.4	9.6		9.4	13.5	10.6			30.1	9.7	9.8	9.8	9.7	10.3	7.3	35.7	11.8	9.4	9.7	40.7	10.5	10.3
LBMA AuRM2	99.6	28.3	47.1	x	9.7	28.0		27.7	31.6	30.1			9.9	28.2	29.2	28.9	29.2	30.2	39.6	11.3	37.4	28.0	29.4	12.0	31.6	31.4
LBMA AuRM3	4456			x					317	21.0	15.4	6.3			13.4	23.6	25.8	25.4					12.2		7.8	12.6
LBMA AgRM1	x	7.9	19.0	6.1	7.3		8.0	62.9	30.2	22.4			13.9	8.9	66.1	37.5	5.2	5.5	13.4	4.5	23.0	10.0	49.2	4.7		26.9
LBMA AgRM2	x	61.8	5.5	26.2	40.8		23.5	8.8	110.5	15.7			49.3	16.1	10.6	5.6	23.1	20.9	4.6	23.6	8.6	54.6	4.5	38.1		5.2

DIARY OF EVENTS 2015

MAY

06
The Silver Institute
World Silver Survey Audiocast
New York
www.silverinstitute.org

11-12
MEI Precious Metals 2015
Falmouth, UK
www.min-eng.com

18-22
LPPM Platinum Week 2015
London, UK
www.lppm.com

20
Global Mining Finance – Precious & Base Metals Conference
London, UK
www.global-mining

25-27
Asia Mining Congress 2015
Singapore
www.terrapinn.com

26-28
Mines and Money
Beijing, China
www.minesandmoney.com/beijing/

JUN

01-02
Peru Mining Summit
Lima, Peru
www.latinmarkets.org

13-16
39th Annual International Precious Metals Institute Conference
San Antonio, Texas
www.ipmi.org

25
LBMA Bullion Market Forum
Mandarin Oriental Hotel,
Shanghai, China
www.lbma.org.uk

26-28
Gold 2015 World Conference
Cardiff, Wales
http://sites.cardiff.ac.uk

JUL

03
LBMA AGM
Glaziers Hall, London, UK
www.lbma.org.uk

AUG

03-05
Diggers & Dealers Forum 2015
Kalgoorlie, Australia
www.diggersndealers.com.au/

21-23
12th India International Gold Convention
Grand Hyatt, Goa, India
www.goldconvention.in

23-26
2015 Conference of Metallurgists
Toronto, Ontario
Web.cim.org/com2015/

SEP

16-18
China International Silver Conference 2015
Shanghai, China

16-18
Precious Metals Summit
Park Hyatt Beaver Creek,
Colorado, USA
www.precioussummit.com/

20-23
Denver Gold Forum 2015
Hyatt Regency, Denver,
Colorado, USA
www.denvergoldforum.org

OCT

12-16
LME Week 2015
www.lme.com

18-20
LBMA/LPPM Precious Metals Conference 2015
Vienna, Austria
www.lbma.org.uk

NOV

03-04
2015 Precious Metals Summit
Park Hayatt, Zurich, Switzerland
www.precioussummit.com

Regulation Update

By Sakhila Mirza, LBMA General Counsel

Responsible Gold Guidance (RGG)

Refiner audit reports

It has been three years since the LBMA launched its Responsible Gold Guidance (RGG). Both the refiners and auditors have worked hard during this time to understand the requirements and to ensure the LBMA RGG has been implemented successfully. The LBMA RGG extends the OECD Gold Supplement for Refiners and builds on existing Anti-Money Laundering and Know Your Customer management systems and auditing practices. It also makes what is a voluntary system (the OECD Guidance) mandatory for all LBMA Good Delivery gold refiners wishing to be accredited for the London Bullion Market. As per the RGG, all refiners have three months from the end of their financial year to submit the independent audit report to the LBMA. For most refiners, this deadline for the 2014 production is March 2015. The LBMA is continuing to receive audit reports. We are hoping that by the next edition of the *Alchemist*, we can report that the majority of the Good Delivery refiners have successfully passed.

Fair Effective Markets Review

The Fair and Effective Markets Review was set up by the Chancellor and the Governor of the Bank of England on 12 June, 2014. It is a joint review chaired by the Bank of England's Deputy Governor for Markets and Banking, Nemat (Minouche) Shafik, with Martin Wheatley (Chief Executive Officer, FCA) and Charles Roxburgh (Director General, Financial Services, HM Treasury) as co-chairs. The full consultation document, entitled 'How fair and effective are the fixed income, foreign exchange and commodities markets?' examines what needs to be done to reinforce confidence in the fairness and effectiveness of the Fixed Income, Currency and Commodities (FICC) markets. The precious metals markets are referred to a number of times throughout the Review. The LBMA response is available on the Bank of England website for public review (http://www.bankofengland.co.uk/markets/Documents/femr/lbma.pdf

In summary, the LBMA indicated that there was no need for further regulation but supported the need for further transparency through post-trade reporting. The LBMA also took the opportunity to describe the characteristics of the precious metals markets and the controls that exist to help the market to operate against a fair and effective framework. The Review will be able to take the existing framework into consideration before coming out with its proposals later this summer. The LBMA has welcomed the opportunity to provide further support and advice on the precious metals markets and to work closely with the Review to help implement its agenda. This all ties in very closely with the LBMA strategy which is featured in the Editorial on page 26.

Other regulatory news…

Basel III: The LBMA is working with the World Gold Council and has launched a survey for its member banks to complete. The survey is focused on getting actual data from the banks in order to defend the position that by imposing a fixed Required Funding Ration of 85%, it would have a significant impact on the banks. Gold is a unique commodity and its specific attributes should be taken into account.

Financial Conduct Authority (FCA): Benchmark Consultation: The LBMA submitted a response to the EU on the FCA Consultation Paper (CP) on Benchmarks. The CP was focused on amending the existing FCA rules that were written for LIBOR by extending the scope to include seven additional benchmarks, which include the LBMA Silver Price and the LBMA Gold Price. The CP drew a distinction between benchmarks that had submitters and therefore needed to be regulated directly, and those benchmarks that had non-submitters and therefore did not need to be regulated. The LBMA in its reply asked for further clarity on the proposal under the CP.

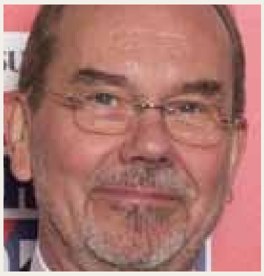
OECD Forum on Responsible Mineral Supply Chains, 4-6 May, 2015

LBMA members, particularly banks and refiners, are encouraged to attend this event in Paris. Please contact the LBMA for further details at regulatory.affairs@lbma.org.uk

EU Update

The LBMA Executive received an invitation from the secretariat of the Committee in International Trade of the European Parliament (INTA) to take part in the special technical briefing with external experts on practical aspects of due diligence and responsible sourcing of minerals, in January 2015. The LBMA was given the opportunity to explain the detail of its RGG and to share our experience of implementation. It was explained that refiners have an incentive to implement and comply with the LBMA's programme, because otherwise they would be removed from the Good Delivery List. The LBMA is of the view that industry programmes should be recognised by the European regulators, under their regulation on conflict minerals. If the European Union proposed another audit independent of what the LBMA has in place, it would undermine the credibility of the industry programme.

Obituary - Tony Baird



It is with deep regret to report the passing of Tony Baird on Sunday 12th April, 2015. Tony was the founder and Chairman of Baird & Co, a stalwart of the London bullion market who regularly attended industry events including those organised by the LBMA. He will be sadly missed. Tony Dobra, Executive Director of Baird & Co, recalls his life.

Antony Stephen Baird was born in 1942 at the family ancestral home in Lanarkshire in Scotland. Shortly after the war the family moved to London. After leaving school, Tony set off to see the world with just his guitar for company. Having reached Perth, Australia, he settled down and took up ocean yacht racing, taking part in many famous events including the Sydney to Hobart race. On returning to London, he took up motor racing, competing in ultra-light weight Berkeley sports cars.

Tony began bartering coins at school but it was not until 1967, and the launch of the South African krugerrand, that he took up coin dealing as a full time occupation. By the mid 70s Tony had established a permanent office in Stratford and would often drive to Switzerland in his E-Type Jaguar to collect thousands of gold coins. In 1982 VAT was applied to gold coins and the subsequent collapse of the UK gold coin market encouraged Tony to diversify in to other gold products, particularly jewellery manufacturing and more recently producing small gold bars. He was instrumental in designing Baird & Co's new refinery and factory premises in Beckton, which opened in 2008.

Tony leaves his wife Lorena and two sons Alex and Carlos. A very small private funeral has been arranged although a party will be held on 10 September, 2015 to celebrate his life and LBMA Members are welcome to attend.

Obituary - Madhusudan Daga

By Stewart Murray, LBMA Good Delivery Consultant

Daga-ji on home ground at the Zaveri Bazaar, Mumbai in 1994

26 December 1926 – 2 April 2015

The passing away of Madhusudan Daga – Daga-ji as he was affectionately known in the Indian bullion market – at the age of 88, is a very sad loss for all who knew and loved him. The Indian market now has to say farewell to its most knowledgeable and engaging observer.

In his long life, Madhusudan Daga played many parts and even for his friends in the bullion market, some of his previous roles may come as a surprise. Many are aware that he was honoured by the Indian government as a freedom fighter after independence in 1947. His contribution to the struggle (including the blowing up of railway lines) led to him being jailed by the British authorities and there was a delicious irony that the new Indian government subsequently awarded him a lifetime freedom pass on the Indian railway system. He went on to make great use of this pass during his career as a journalist and perhaps even more so as he developed into the Indian bullion market's most respected analyst, commentator and advocate.

What is much less known is that in his youth he went through a 'playboy' phase – when he produced a Bollywood film (with a well-known actor as its star), when he was a racehorse owner and, most surprising of all to those who knew him only in his mature years, when he was a whiskey drinker!

All this changed when he met his guru whose picture, surrounded by dried flowers, was the first thing that you would see on entering the small but welcoming apartment just behind Worli Seaface in Mumbai where Daga-ji lived until the end of his life. This meeting was clearly a transformative experience for him which ultimately led to his becoming the towering presence in the development of the Indian precious metal markets in the second half of the 20th century. Henceforth, he was a devout, teetotal, strict vegetarian whose career as a journalist flourished in parallel with his growing interest in, and understanding of, the gold market in India.

During his purely journalistic career, he interviewed some very famous people, including Rajiv Gandhi. But gradually his interest focused more and more on gold and he began to develop a most amazing network of contacts throughout the country. Long before LinkedIn or Facebook (Mr Daga acquired his first computer when he was in his 80s), his little black book contained the names and addresses of many hundreds of people who were involved in every aspect of the market: ministers, bureaucrats, central bankers, bullion dealers and commercial bankers, jewellery manufacturers and retailers, other journalists covering the sector and, finally, the one group about which he was somewhat coy, the smugglers who ensured a continuing supply of gold bullion to the Indian market during the period of Gold Control.

Gold Control was introduced by the Indian government in 1963 in an attempt to minimise ownership of gold by the population and to prevent foreign exchange being used for imports of new gold. However, the main impact was to force the local price to a very high premium compared with the international market, the main beneficiaries of which were the smugglers. Together with his friend Shantilal Sonawala, Daga-ji became the main advocate for the abandonment of Gold Control and their efforts bore fruit in 1990 when the act was repealed.

From an international perspective, the name Madhusudan Daga meant virtually nothing until he was listed as one of the contributors to the 1986 edition of the annual Gold Survey, which had been published by Consolidated Gold Fields since 1969. But as Tim Green (who as a consultant had been mainly responsible for the research on gold for the Survey since its outset) notes, Mr Daga's information on India had always represented a key element in understanding the development of the market there.

My own first experience of Mr Daga (I never addressed him as anything else) was in 1987 in Gold Fields' elegant St James's Square offices, where at the time I was employed as a so-called copper expert. In common with many of my colleagues, I wondered who this rather wizened, elderly Oriental visitor was. But it was only several years later, after I had had the privilege of setting up Gold Fields Mineral Services and started to visit India on a regular basis, that I began to understand what made him so special. On the one hand, his investigative journalist's nose led to him uncovering amazing facts about, for instance, the use of gold in the manufacture of *jari* and the large quantities of silver that were sold in *gutkha* (chewing tobacco). His journalistic scoops included the pledging of gold by the Reserve Bank of India during the currency crisis in the early 1990s and he reported on the round tripping of gold before many in the trade even knew about it. On the other hand, travelling the length and breadth of India with him, in an attempt to understand how this fascinating market was developing, I not only met many of those listed in the little black book but I also got to appreciate him for his humanity. For most of his life, Mr Daga was a diabetic – a condition which he controlled by means of either long walks or the consumption of dried chapattis (without a supply of which he never travelled). But he took this affliction literally in his stride and never complained. Apart from all of the above, my abiding memories of Daga-ji were his loyalty, kindness, sense of humour and determination that not only he but everyone else should do the right thing.

His like will not be seen again.

Tim Green writes:

I first met Madhusudan Daga at the Bombay Bullion Association in the early 1970s, which I was attending in the first years of the Consolidated Gold Fields annual survey (now the GFMS survey). His challenging questions, both to me and the Association, established him as a dedicated reporter.

Since I was a reporter too, we had much in common in seeking out the secrets of India's gold trade. From that first meeting, he tended to park himself in my room at the Taj Mahal Hotel, constantly on the phone seeking prices and trends. Over the next 25 years, whenever I arrived in Bombay, usually from Dubai, he was waiting at the aircraft ramp to bustle me through customs with his press card, thence to the gold traders in the city.

In the evenings, we walked by the sea along Worli Seaface still talking gold. Once we met an acquaintance of his: rather than pleasantries about the sea breeze giving respite from the heat, we fell immediately into a discussion on gold. "Every Indian woman, rich or poor, must have gold for security," explained our fellow walker, "and as it is a social privilege, the sale of family ornaments is a blot on the map."

Madhusudan Daga led a simple life in a flat near the sea and was looked after by two women whom he had rescued from a refuge at the end of his street. He was a great friend who will be missed by many.

LBMA News

By Ruth Crowell, Chief Executive, LBMA

MEMBERSHIP

Standard Chartered Bank was reclassified as a spot and options Market Maker on 9 February and Toronto Dominion Bank was reclassified as a forward Market Maker on 19 March. This brings the total number of LBMA Market Makers to 15. The full list of Market Makers on the LBMA website shows the products (spot, forwards and options) provided by each company.

On 20 January, Coeur Mining Inc. was admitted as an Associate and on 12 March, Metals Focus Ltd was also admitted as an Associate. On 27 January, Glencore International AG was admitted as an Ordinary Member and Britannia Refined Metals Ltd resigned as an Ordinary Member following a merger between Xstrata Plc and Glencore Plc. On 12 March, VTB OJSC was admitted as an Ordinary Member (formerly an Associate). These changes brought the membership to 146 companies, comprising 77 Members (of which 15 are Market Makers) and 69 Associates.

GOOD DELIVERY LIST

On 5 January, the silver refinery of Hunan Yuteng Nonferrous Metals Co., Ltd and Yanggu Xiangguang Copper Co., Ltd were both admitted to the Silver Good Delivery List. There are currently 73 refiners on the Gold Good Delivery List and 83 on the Silver Good Delivery List.

COMMITTEES

Management Committee
The Committee worked with the Executive, the Regulatory Affairs Committee and the Market Makers group to ensure that the new LBMA Gold Price was successfully implemented as planned on 20 March. ICE Benchmark Administration (IBA) provides the auction platform, methodology as well as overall independent administration of the transparent electronic auction process. The LBMA's new subsidiary PMPL holds the Intellectual Property (IP) rights for the new price. There are seven direct participants who currently contribute to the LBMA Gold Price: Barclays Bank, Goldman Sachs International, HSBC Bank USA NA, JP Morgan, Societe Generale, The Bank of Nova Scotia – ScotiaMocatta and UBS. Members of the market are encouraged to contact IBA in order to become direct participants (iba@theice.com).

As well as assisting the Regulatory Affairs Committee with important work on precious metal benchmark prices, the other main priority for the Committee is the long-term strategy and structure of the Association (see the editorial on page 26). This is in view of the fact that the market needs more support given the changing regulatory and infrastructure landscape. The Committee is therefore considering the future structure, governance and organisation of the LBMA to ensure that it continues to meet the requirements of its members in an ever changing financial environment.

The Committee is also involved in reviewing the work of the SubCommittees below.

Regulatory Affairs Committee
The attention of the Committee in recent months has been focused on developments with precious metals benchmark prices, particularly in preparation for the launch of the LBMA Gold Price on 20 March. This work is reviewed in a feature article by Sakhila Mirza on page 3.

The LBMA's role in providing market infrastructure has recently increased from the Good Delivery accreditation to encompass benchmarks. Going forward, it will have broader scope of work to contend with as regulatory requirements increase. These regulations include US Dodd-Frank, MIFID and MIFIR, as well as the potential regulation resulting from the Fair Effective Markets Review (FEMR). FEMR focuses not only on benchmarks, but on the entire structure and conduct of the London precious metals market. For further information, please read the Regulation Update on page 22.

Physical Committee
Since the publication of the last edition of the Alchemist, two new refiners have been added to the silver list. There are currently two active applications – one for gold and one for silver – and four applications are expected – one for gold and three for silver.

The GDL website has now been modified to accept GDL Refiner kilobar information. The website will be updated as further information becomes available. It is envisaged that packaging information will also be included.

The latest round of proficiency testing was completed and the report was circulated to all participants. For the first time, the Proficiency Testing scheme was extended to include Supervisors and Assay Offices. A presentation was delivered by Jonathan Jodry at the recent LBMA A&R Conference and a transcription of his presentation is reproduced on page 14.

The latest round of Pro-Active Monitoring has commenced (Round 28) and the 11 refiners involved have been informed.

Visual Guide II is now at an advanced stage and is due for completion by June 2015. An update to this effect was also presented by Stewart Murray at the LBMA A&R Conference.

Raj Kumar and Neal Johnson have both resigned from the Committee and the LBMA would like to take the opportunity to thank them for all their hard work and sterling contributions to the work of the Committee.

Membership Committee
The Committee continues to review a growing number of Membership applications, which demonstrates the growing relevancy and diversity of the Association. Two new mining companies have joined the ranks of the Association. The LBMA welcomes other producers to join and have a voice in the London market. Another demonstration of the diverse reach of the Association is the recent interest expressed by some central banks.

In order to strengthen the voice of the refiner in the Association, the Committee has also agreed to allow Good Delivery refiners to apply for Ordinary Membership, not only Associateship. This means more refiners would have the opportunity to vote as well as stand for the Management Committee. Any refiners, producers or central banks who may be interested in doing so are invited to contact Sunny Field at sunny.field@lbma.org.uk. Further refiner, producer and central bank membership would be a welcome development and would further extend the breadth and strength of the LBMA.

Finally, there has also been an increase in the number of Market Makers in recent months. There is now a total of 15 Market Makers, with the prospect of further additions later in the year.

Public Affairs Committee
The Committee is actively preparing the speaker programme and arrangements for this year's LBMA Bullion Forum, which will be held in Shanghai on 25 June. This event focuses on the growth of the precious metals market in China and Asia generally. Please refer to the LBMA website for further updates.

The other main focus for the Committee is preparing another high-quality programme of speakers for this year's LBMA/LPPM Conference on 18-20 October in Vienna. Speaker highlights include Keynote Speakers Lord Gus O'Donnell, Strategic Advisor to Toronto-Dominion-Bank, and John Authers, Senior Investment columnist at The Financial Times. In order to ensure this year's event is not compromised by overcrowding, there will be a cap on the maximum number of possible delegates. Registration for the event will open in June and will be on a first come, first served basis.

The PAC is delighted to welcome Jonathan Butler of Mitsubishi as its newest member. This position became available following the departure of Tom Kendall and Anne Dennison. The LBMA is grateful to both for all their hard work over the years.

Other LBMA Events
The Annual Party took place on 26 February at All Star Lanes and was very well received by all those who attended. Photos and a summary of this 'Members' only' event can be found on page 17. Congratulations to the team from CME Group who won the bowling tournament.

The LBMA held its sixth Assaying & Refining Conference at the Millennium Hotel on 9-10 March. It proved a great success, with the highest level of attendance and presentations to date. A review of the conference can be found on page 12 and a presentation from Jonathan Jodry from Metalor Technologies is reproduced on page 14.

Finance Committee
Given the ongoing strategic review, the Committee is currently re-evaluating its short-term and long-term funding to ensure stability for the Association. As part of this, it was identified that Good Delivery annual maintenance fees had not been increased in over 10 years. During the past decade, the LBMA's Good Delivery work has significantly increased. Notable additions include Pro-active Monitoring, Proficiency Testing, Certified Reference Materials and, of course, the LBMA's Regulatory work, including REACH and Responsible Gold.

With an ever increasing workload, the costs associated with maintaining the Good Delivery List has dramatically increased. However, this has not been reflected in the Maintenance Fees in the last 10 years. The high volume of work required the LBMA to reach into its reserves in 2014 in order to address all of the challenges faced, resulting in a significant imbalance. The Committee therefore approved an increase to the Good Delivery List annual maintenance fees. From 2015, the fees are as follows: Gold or Silver (1 metal) – £8,000; Gold and Silver (2 metals) – £12,000. The increase in fees will now cover the GDL costs and, going forward, the LBMA will ensure that these are reviewed on a regular basis in order to offset any future dramatic increases in costs.

The annual external audit took place recently and it was pleasing to see that the accounts and processes received a clean bill of health, with no significant issues identified. The auditors were pleased to note that new controls identified in last year's audit had been successfully implemented.

Annual General Meeting
The Annual General Meeting of the LBMA will take place in Glaziers Hall, 9 Montague Close, London Bridge, on Friday 3 July at 16:30. This is an ideal opportunity for any interested staff in Member and Associate companies to hear about what the LBMA has been doing and to meet representatives of other member companies. This year, it will be the turn of the five Market Making member representatives to be elected (or re-elected). In line with the usual procedures the documentation including nomination forms for the Management Committee election will be circulated to the LBMA contact in each Member company in advance of the meeting. The AGM will be followed by refreshments at 17:30 in the River Room, Glaziers Hall.

LBMA Staff
The LBMA is delighted to announce a number of changes to the Executive team.

Neil Harby joined the Executive as Good Delivery List Officer in February and provides strategic support to the Chief Executive in the management and development of the Association's Good Delivery System. Prior to joining the LBMA, Neil worked at the Rand Refinery for more than 17 years as Executive Head, Technical Assurance. During that time, he managed a multidisciplinary team of scientists, engineers and ancillary staff that included the following disciplines: Mass Metrology, QA/QC, Metallurgical Services, Evaluation Services, Analytical Services and Metals Assurance.

Varsha Peiris has been appointed as the Good delivery List Co-ordinator. Varsha had previously been the LBMA's Office Manager.

Jamie Maskall has also joined recently in the Executive's newest position, Marketing & Communications Lead. This new senior role reflects the increased exposure and workload of the Association. He will be responsible for developing the marketing and communications strategy for the Association. Prior to joining the LBMA, he worked for Thinkbox, a not-for-profit marketing body for commercial TV in the UK. He also has over 10 years' experience within the advertising industry, including positions at Leo Burnett and Young & Rubicam, and brings a dynamic and new skill set to the Association.

Finally, the LBMA warmly welcomes Jamilah Leigh as Office Administrator. Jamilah's responsibilities include office management, processing membership applications and general administrative tasks to support the entire Executive team.

Market Moves

Rory McVeigh rejoins Commerzbank
Rory McVeigh has rejoined Commerzbank AG in London in the Precious Metals Sales team as a Specialist. He is returning as part of its new Global Sales Team with his expertise in PGMs and experience of more than 15 years in the market with Marc Rich Ltd, Mitsubishi Corporation, Commerzbank Luxembourg and BASF Metals Ltd in both trading and sales.

Mai Troung joins Commerzbank
Mai Truong has also joined the Precious Metals Sales team as a Specialist, in an internal move at Commerzbank in London after helping to establish Commerzbank Commodities as one of the best structured products providers in Europe. She joined Commerzbank in 2008 after working for four years at Deutsche Bank across different asset classes (credit, interest rates and structured commodities). She has also worked with a wide range of clients, from financial institutions, private banks and high net worth individuals to corporate, and will bring her knowledge and experience into the team to develop new products and solutions for the Precious Metals customers.

Richard Punt retires from JBR Recovery Ltd
Richard Punt, Operations Director at JBR Recovery Ltd, the UK's leading Good Delivery silver refiner, refining silver from waste and recycled materials, retired on 10 April 2015 after more than 35 years' service. He joined John Betts Refiners, which was then part of W Cannings plc, in 1979 as works project engineer, working his way from Technical Director to Operations Director, with responsibility for the West Bromwich-based refinery. **Keith Davies,** currently Operations Manager, has replaced Richard as the new Operations Director with effect from April.

Keval Sangani joins Toronto-Dominion Bank
Keval Sangani joined the Toronto-Dominion Bank Global Metals desk in London at the beginning of March in a Sales and Marketing role and will focus on the strategic growth and ongoing support of its client base in the EMEA region. He brings with him a high level of client-facing experience and product knowledge from his time at Deutsche Bank AG and latterly with Credit Suisse International.

A New LBMA – Strategy, Kilobars and International Engagement

Editorial Comment by Ruth Crowell, Chief Executive, LBMA

The LBMA has gone from strength to strength in the last year, but the evolution is not over. I look forward to addressing you in a year from now from a transformed organisation – one that not only provides the services that the international market needs but that also provides leadership for its future direction. As we have said on multiple platforms in the last year, we are developing the structure and governance of the LBMA to fit the needs of a changing market. The market has seen our work on benchmarks, but this is only a small part of the work of the LBMA. There has been an exponential expansion in the scope of the work of the Executive, and this started back in 2010.

A year in office and I'm happy to say that we now have the senior leadership team in house to professionally tackle the expanded scope of work. Neil Harby – Good Delivery Officer, Sakhila Mirza – General Counsel, Sunny Field – Operations Director and Jamie Maskall – Marketing and Communications Lead, have all joined in the last 10 months. In that short time, they have made an enormous impact. The injection of more senior leadership has fundamentally invigorated the organisation. For many years, the sheer volume of work has kept the Executive in a reactive, as opposed to, a proactive mode. Adding senior executives gives the Board the capacity to focus on the strategy and future vision of the LBMA. The new Executive can run the day-to-day business and the Board can focus on determining what the market needs from the LBMA going forward.

So let's talk about what's on the agenda for discussion at the New LBMA, or what I like to call 'LBMA International', copyright pending. We have already started work on consistent engagement in international markets, including the kilobars market, and more recognition for refiners and miners. We have continued our regulatory work via a new version of Responsible Gold as well as preparation for UK, EU and international regulation, in particular Basel III. As part of our recently launched Strategic Review, we will also consider a whole range of options for the benefit of the bullion market. This Review is being conducted through close consultation with the Membership and the global market, and will also incorporate the findings of the UK Fair & Effective Market Review, scheduled to be released in June.

As part of our enhanced engagement with international markets, we have recently launched registration for our Bullion Market Forum in Shanghai, 24- 25 June, which is being held in partnership with the Shanghai Gold Exchange. We are also delighted to be holding our third LPPM/LBMA Members' Reception in New York during Platinum Week. In August at the India International Gold Convention, we will be speaking and looking to engage in dialogue on international and local market issues. We have also recently launched a series of webinars to raise awareness of the major issues facing the market. These new events all complement the annual LBMA/LPPM Conference, which this year will take place in Vienna in October.

Turning to Good Delivery work, our involvement in the kilobar market was agreed last year when we announced that we would be assisting LBMA custodians by collating the kilobar drawings and pictures for Good Delivery gold refiners. So far we have received the kilobar specifications for half of the refiners on the Good Delivery List. This information will be kept up to date and will be available for LBMA custodians and their vaults in London and abroad. We are looking to further developing our kilobar work on this to assist our Members trading worldwide.

The discussion of kilobars is also one of the first items on the agenda for our new Refiners Forum. This advisory group is being set up in order to give refiners more of a voice and opportunity for dialogue with the LBMA. This will not disrupt or detract from the work of the LBMA Referees but will focus on general issues facing refiners. The Refiners Forum will give other refiners an opportunity to get involved in the work of the LBMA. We will also be looking to this advisory group to give feedback on the direction of the LBMA via its Strategic Review.

The changes to benchmarks over the last 10 months have been a challenge that we as a market have successfully met. The evolution of the role of the LBMA started back in 2010. This was with our efforts in Responsible Gold, where we did more than just tick the regulatory box required by the Dodd-Frank Conflict Minerals legislation. We created a long-term solution that set a high standard for the market. The LBMA's RGG programme enabled the market to smoothly face the Dodd-Frank regulation when it came into effect in 2014. Had we not broken the back of this, last year could have been even more disruptive when the rules came into place. Our Responsible Gold leadership and adoption of the OECD's voluntary standards have meant that as an industry we are now in a stronger position than the European tin, tantalum and tungsten markets. Gold as well as these other three minerals are also in scope of the forthcoming European Conflict Minerals legislation. These industries now have to revise their programmes to meet the OECD International standards, which the EU is planning to adopt. The gold industry has fully implemented our programme for refiners, based on the OECD Guidance and is regarded as a leader in this field.

With the benchmarks, we also showed leadership by taking ownership of the prices following detailed consultation with market participants and regulators. Not only did we manage to ensure that daily precious metal spot prices continued to be available to London and the international market, but we also ensured that the market had a voice via the LBMA. Our ownership of the intellectual prices means that the LBMA can react on behalf of the market if there are issues that need to be addressed. It also means that the London market was able to retain ownership of the family silver, i.e. the benchmark prices it had created over the past 100 years.

My vision for the New LBMA is that we continue to show leadership and long-term vision. We have launched our Strategic Review, with the assistance of EY, in order to achieve this. Part of the guiding principles for this work is to achieve more for the market than simple compliance. Let's use this opportunity to give the market some of the additional services it actually wants. Enhancement of services will not only strengthen the infrastructure but grow the business of its members and customers.

While its structure, services and governance will continue to evolve to serve the market, the fundamental role of the LBMA will not change. And that role is to ensure that the London Bullion market continues to serve the needs of its members and their customers in what is truly a global business. I invite you to engage with the LBMA during this Strategic Review and to help us to build a New LBMA.

The Alchemist is published quarterly by the LBMA. If you would like to contribute an article to the Alchemist or if you require further information please contact Aelred Connelly, London Bullion Market Association, 1-2 Royal Exchange Buildings, Royal Exchange, London EC3V 3LF
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facing facts

William Tankard, Research Director, Precious Metals Mining and Janette Tourney, Research Analyst, Thomson Reuters GFMS.

Producer Hedging: Two Swallows Do Not a Summer Make…

Following the news in mid-2014 that Polyus Gold International had entered into a substantial new hedge position in order to protect revenue during the early stages of its Natalka project, there was a certain amount of speculation that this could herald a return to large-scale gold producer hedging. The Polyus hedge position was significantly larger than any other individual hedge of recent years, covering 88 tonnes (2.83 Moz) of production, and in part employed barrier options, which have not been a component of the producer hedge book since the mid-2000s. This activity represented a marked departure from trend, after several consecutive years of small-scale hedge activity comprising only forward sales and vanilla options.

As a consequence, the last nine months have seen debate within the industry regarding whether or not the Polyus hedge was to be the first manifestation of a more widespread shift towards large-scale hedging by the major gold producers. However, with 2014 now behind us, the wider impact of the Polyus hedge on the global hedge book is more apparent, as are the broader industry trends surrounding producer hedging.

The remainder of 2014 was, for the most part, characterised by further small-scale hedging of a similar magnitude to the activity that has comprised the hedge book over the last few years. In some cases, producers expanded pre-existing hedge positions or chose to extend ongoing forward sales programmes. Some small-scale new hedging was undertaken by development-stage gold companies as a condition of obtaining project finance. The only exception to this 'business-as-usual' hedging activity was the announcement by Fresnillo that they had entered into options contracts covering 47 tonnes (1.52 Moz) of production during the fourth quarter. This covers output from the remaining 44% minority interest in the Penmont Joint Venture, acquired by Fresnillo from Newmont in October 2014.

The combined outcome of the Polyus and Fresnillo hedges, together with the uptick in the number of small-scale hedges announced during the fourth quarter, was that 2014 saw a return to net hedging, amounting to 103 tonnes (3.31 Moz). This was only the second year since 1999 that we have recorded net producer hedging – hence the market speculation that this represents a fundamental shift in sentiment towards hedging of gold production.

However, it is important to view the result of 2014 within a broader historic context; the absolute size of the global producer hedge book is a small fraction of what it was during the late 1990s and early 2000s. Although the hedge book doubled in size last year, from its historic low of 91 tonnes (2.93 Moz) at end-2013 to 195 tonnes (6.26 Moz) at end-2014, the size at the end of 2014 was only 6% of the hedge book volume at its peak in 1999. Last year's swing to net hedging is therefore not necessarily of much significance when viewed in relation to market events over the past 15 years.

Furthermore, as a proportion of the gold industry, the number of producers with active hedge positions remains relatively small. At the end of 2014, the global producer hedge book consisted of only 42 companies, and although this number has seen slow but steady growth in recent years, many of the new additions to the hedge book have been Australian-based miners taking the opportunity to enter into Australian dollar-denominated hedge contracts at a time when the Aussie gold price has had a boost, courtesy of US dollar strength.

Turning to the factors that may drive a return to large-scale producer hedging, it is also helpful to look to historic events. The last period of widespread hedging by gold producers, during the late 1990s, was followed by a spectacular gold bull run, with painful and long-lasting repercussions for a number of the most prominent hedged gold miners. Neither the miners nor their investors have forgotten this episode, and sentiment therefore remains broadly opposed to hedging, notwithstanding the fact that, after two consecutive years of a sharply falling gold price, the bull run is undeniably over.

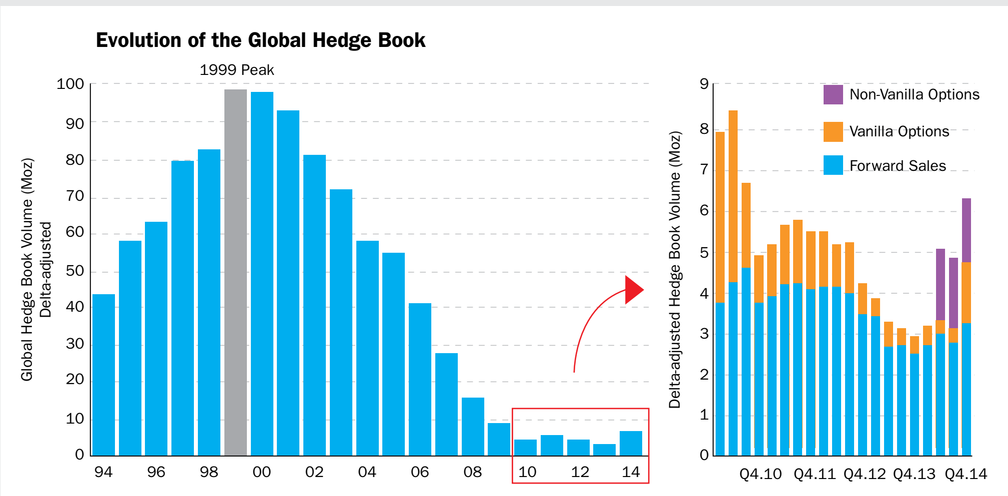
Given that the hedge book at the end of 2014 remained relatively modest in size, the magnitude of the deliveries scheduled over the period from 2015 to 2019 is correspondingly small. Consequently, these could be outweighed by a modestly increasing volume of hedging by smaller producers or, alternatively, by only one or two new hedges of the scale seen from Polyus or Fresnillo last year. On the basis of this current scenario, we expect to see net hedging prevail over the next few years, in a continuation of the trend seen in 2014. However, in our opinion, this still does not represent a return to the frenetic hedging activity of the 1990s; rather, we are looking at activity on a smaller scale, with a much more limited capacity to impact on global gold supply-demand dynamics.

William Tankard, Research Director, Precious Metals Mining, Thomson Reuters GFMS

Having joined GFMS Ltd as a Metals Analyst in 2005 to cover the mining sector, William was brought across to Thomson Reuters in GFMS' 2011 acquisition and holds the role of Research Director – Precious Metals Mining, within Thomson Reuters' Commodity Research & Forecasts division. He has accountability for the mining team's research output of global production, mining costs and producer hedging research across the precious metals.

Janette Tourney, Research Analyst, Thomson Reuters GFMS

Janette joined Thomson Reuters GFMS in January 2013 as an Analyst within the Mine Economics team with a research remit across the precious metals mining products, specifically Mine Economics, as well as our annual Survey and forecast reports. She previously spent two years as a Mining Analyst at Vicarage Capital and holds a PhD in Geochemistry from the University of Edinburgh.



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