LBMA

Alchemist

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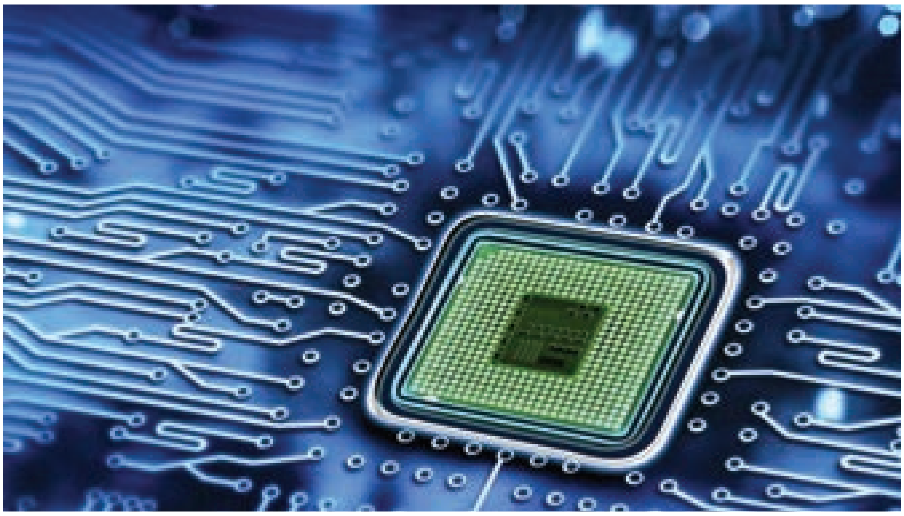
In this issue

"O Richard! O my king! Thou art by all forgot, Through the wide world I sadly sing lamenting thy drear lot" The coins, from the Austrian Mint collection, depict the legend behind the capture of Richard the Lionheart near Vienna. Re-produced here with the kind permission of the Austrian Mint.
See page 5 for the full story.

TD Securities

Gold and the Blockchain

By Charlie Morris, Editor of Atlas Pulse and CEO of CCData.CC



Bitcoin, the digital or 'crypto' currency launched in 2009, was designed to mimic gold in the digital age. There are deliberate similarities between them, such as scarcity, and the term used to describe the creation of new bitcoins is 'mining'. Whilst the bitcoin network is still growing, the turbulence has been extreme and its future relevance remains uncertain – at least as a store of value.

Gold has seen off this computerised impersonator for the time being, and whilst that is unlikely to change anytime soon, the gold market has much to learn from the software that drives bitcoin, known as the blockchain.

Gold is bulky and LBMA members agree that it is best left in the vaults in a provenance network. For many years, this social technology has allowed the wholesale gold market to thrive. Dealers on opposite sides of the planet can be sure that their gold is genuine, despite never having seen it. Until 2003, the retail market was left behind and investors were limited to buying coins with dealing spreads of over 5%. There was no cost-effective way for the general public to invest in gold.

Then the exchange-traded fund (ETF) was launched, which allowed smaller transactions to become viable, thus opening up the market to a much wider audience. For the first time, gold could be traded as if it were a share. With online dealing commissions of $10 or less, the efficient transaction size fell below $1,000 for the first time.

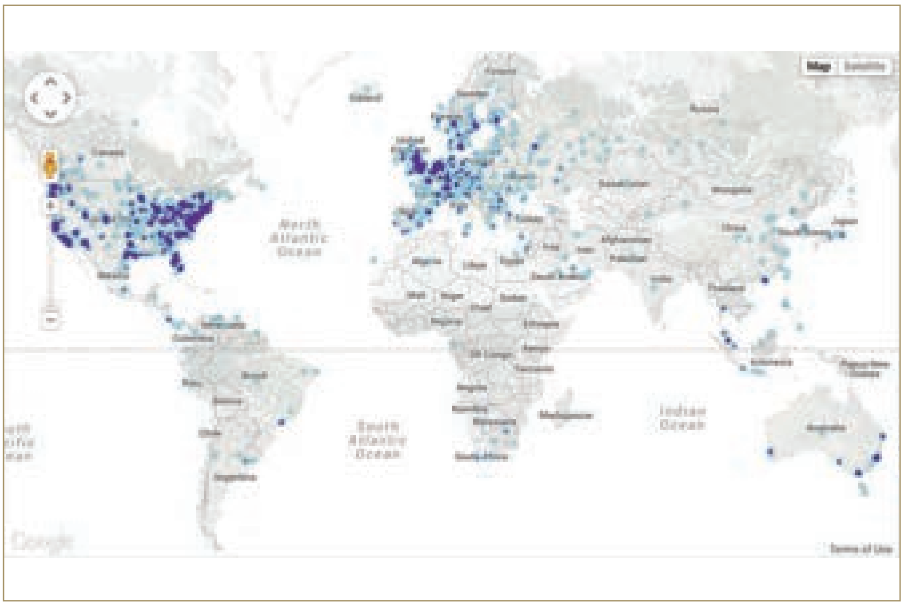
Whilst bitcoin has failed to surpass gold as the backstop of the financial system, the blockchain shows great potential. This technology enables transactions to be highly secure, whilst dealing costs virtually disappear. By settling gold transactions over a blockchain, the efficient transaction size could fall to less than a dollar, with dealing costs just a fraction of a cent. For the first time in history, gold could be swapped for a cup of coffee.

Gold on the blockchain

There are a few technical terms that are worth understanding. A public blockchain is a decentralised database that is open to all. For bitcoin, there are more than 6,000 identical copies (nodes) running around the world simultaneously in 84 different countries. To switch the network off, every single copy would have to be destroyed. That's not an easy task.

When a bitcoin transaction takes place, it is recorded and verified by the 'miners'. These miners use vast amounts of computing power to operate the network. The more power they use, the more secure the network becomes. All transactions and ownership records are published on the blockchain and can't be deleted. The miners ensure that each transaction is valid (you can't cut and paste a bitcoin) and, for their efforts, are rewarded with new bitcoins and some transaction fees.

Chart 1 shows the average number of bitcoin transactions each day. The network continues to grow, but the rate has slowed as its role as a currency has, so far, failed to deliver.



Location of bitcoin nodes. Bitcoin nodes are copies of the database. There are more than 6,000 copies around the world. To shut the network down, every single copy would have to be exterminated. That's no easy task.

Anyone with a super-computer can become a miner, and it is a highly competitive process since the miners are competing for value. Remarkably, the network functions with tens of thousands of actors but without any management or supervision whatsoever – perhaps that scares parts of the establishment.

Swapping bitcoin for gold

Several bullion dealers have integrated bitcoin onto their platforms. Companies such as Bitgild, Vaultoro and Bitgold accept payment for gold in bitcoin. Vaultoro excepted, these companies are online gold platforms that accept payment in bitcoin in addition to fiat currencies. Vaultoro, on the other hand, only accepts bitcoin.

"I tested Bitgold to see how it worked. I sent 0.1 bitcoin ($25) and the transaction was picked up by its system immediately, and I became the proud owner of 0.614 g of gold that was stored in Dubai. The whole process took three minutes, which included opening the account."

For most of these platforms, the bulk of the business continues to be done in fiat currencies, and bitcoin has had only a modest impact on sales. To their credit, they have been hugely successful in reducing the dealing costs for small transactions. To their detriment, they are 'centralised' business models as the gold is non-transferrable to third parties once you have purchased it. It is simply your gold, held in their custody.

Buying gold with bitcoin

I tested Bitgold to see how it worked. I sent 0.1 bitcoin ($25) and the transaction was picked up by its system immediately, and I became the proud owner of 0.614 g of gold that was stored in Dubai. The whole process took three minutes, which included opening the account. Not only is that quick, but cheap. I paid just 0.5% above the spot price, which is very competitive, especially given the small size of the trade. Bitgold, like the other platforms, works extremely well.

Bullion Bitcoin

Before any of these gold-for-bitcoin businesses came to fruition, Adam Cleary, an ex-hedge fund manager, founded Bullion Bitcoin. It was 2013 and bitcoin was just beginning to capture the public's imagination. He was ahead of his time and created an electronic token, known as Bits of Bullion (BoB), that was backed by physical gold. He wanted to allow the world to own gold electronically and be able to transfer it thereafter in a 'decentralised' manner.

Adam Cleary, CEO of Bullion Bitcoin – an early adopter of blockchain technology for the gold market.

In this system, the BoB were held in a customised bitcoin wallet, known as a SparkBit, which allowed the gold to be transferred to other wallet holders. The proof of ownership, whilst anonymous, was permanently recorded and could be tracked using bitcoin's blockchain.

I tested the system in late 2014. Once again, I invested 0.1 bitcoin into BoB that immediately showed up in my SparkBit wallet. I was in direct control of my gold and the proof that I owned it was a matter of public record on the blockchain. Above all, I could send my gold anywhere I liked and this is what it means to be decentralised.

The system was a good idea, just too complex to take over the world. Despite being the first to directly create an electronic token linking bitcoin to gold, Cleary's vision was ahead of its time. The user complexity meant that BoB failed to gain traction in the market.

Cleary hasn't given up and believes that the concept would succeed if it were a standardised and collaborative effort by the gold industry. The system would need to be run on a not-for-profit basis and embrace the best features that blockchain technology has to offer – the key objective being that gold would be digitally and freely transferable.

Autilla

There are even more ambitious plans afoot for the wholesale market. The seasoned commodity broker, Mike Greenacre, is the CEO of Autilla. Having already built an exchange for the OTC wholesale gold market, he's developing plans to build a membership-based 'distributed ledger' using a new version of bitcoin known as G-Bit.

In order to do this, the bitcoin code will be adapted to create a new digital 'currency' that would be entirely separate from bitcoin. It would have different design features to meet the specific requirements. Like Cleary's BoB, the G-Bit is expected to have zero value and just act as a secure reference that represents the ownership of gold. The system would be underwritten by 'digitised' physical gold held in a network of vaults.

Unlike crypto currencies, where the blockchains are open for all to see, access to the G-Bit blockchain (accessed via a node) would be restricted to market participants such as refiners, custodians and dealers. The G-Bit blockchain would therefore remain private, but open to all verified users – professional or retail. Autilla will initially focus on the professional end of the market, but will allow partners to embrace retail customers thereafter.

Investors would also be able to trade gold over Autilla's exchange, which provides real-time matching, netting and settlement for the wholesale market. The gold would then be held in a bar provenance network, enabling future transactions to be fast, reliable and secure.

Greenacre describes the process as 'cryptographically generated smart contracts'. He feels that the digital network should be restricted to market participants for security and compliance reasons. The brokers would create and redeem G-Bits in a similar way to how the ETF-authorised participants issue shares. The G-Bits would then be freely transferable within the network. If this plan came to fruition, it would be a giant leap forward for the gold market.

The Real Asset Co

UK fintech is an exciting space and its home is on Level 39 of One Canada Square, Canary Wharf. There are numerous young companies aiming to shake up the world of finance. One such resident is The Real Asset Co, an online gold and silver platform founded in 2010. It has 3,500 registered users and wants to grow its business using blockchain technology and a token called Goldbloc.

The Real Asset Co's plan is similar to Autilla's G-Bit, except that it is aimed at the retail market. Both companies want to use private blockchains, so that they control the network and create digital tokens that effectively become electronic bearer certificates.

"The system was a good idea, just too complex to take over the world. Despite being the first to directly create an electronic token linking bitcoin to gold, Cleary's vision was ahead of its time."

The CEO, Jan Skoyles, has been to 10 Downing Street to advise the British government on blockchains and has represented the UK on trade missions. The response has been positive, and Chancellor George Osborne is fully behind the fintech movement and wants

Britain to take the lead. It is quite clear that Britain has talent, but one of the structural challenges has been regulation.

Jan Skoyles, CEO of The Real Asset Co. If you can't find her on Level 39, that's because she's probably at Number 10.

Regulation

Presumably, the regulators would be relatively comfortable with businesses that operate within a closed loop since they would have a clear audit trail. However, it would be unsurprising if they were somewhat hesitant about retail investors 'emailing' gold around in cyberspace.

The UK's FCA has approached this subject in a positive manner and has created 'Project Innovate' to assist fintech start-ups with regulatory matters. Its brief is to encourage innovation and promote competition within financial services. In order to do this, it must listen to the industry, understand the issues and provide guidelines – it seems to be working.

However, if a business wants its digital gold tokens to be freely transferrable, the regulators might view that as money transfer, which would require a banking licence. That would be onerous, but there may be a technological solution to the problem. Blockchains already track transactions between wallets, it's just that we don't know whose wallet it is. If they could be verifiably identified, perhaps digital cybergold would get the green light.

A digital gold market

The vision is to create digital gold transactions. The result would reduce costs and make gold more accessible to all. The 2.5 billion unbanked people who live in developing countries could consider storing their gold on their phone. The rich could swagger around town with a fortune in their pocket. The Internet would have a borderless means of value transfer with no central counterparty. Finally, we would be able to buy a cup of coffee and pay with gold. That's not a ridiculous idea and, no doubt, many people would embrace this as a means of living through a banking crisis – just ask the Greeks. All of these applications, and more, would be enabled by gold-on-the-blockchain. Like the arrival of the ETF, digital gold would lead to additional demand.

Losing your phone would not necessarily mean losing your gold as security settings are changeable. Naturally, the gold isn't inside your phone. All you need to recover ownership is a copy of your security keys. Using smart contracts, you could opt for two or more trusted parties to authorise a transfer, meaning that you would just lose your phone and not your gold. You could even separate your holdings into savings that are locked down with high security, whilst the more modest holdings of 'readies' could be spent rather like cash in your wallet – for that cup of coffee.

Improving the data

A further added benefit of transacting over the blockchain is the resulting data. Currently, the market keenly awaits the GFMS quarterly release, which gives us a sense of geographic and sector demand trends. The blockchain, whilst keeping individual investors' details confidential, would be able to generate econometrics in real time. Analysts and journalists may even stop guessing why the gold price just moved.

Better data and transparency will benefit the gold market. The more we collectively know, the more faith we have. Gold ownership is much more likely to grow if there are fewer privileged participants.

Dragging the world's ancient and timeless asset into the digital age won't happen overnight, but this is non-negotiable if gold is to fulfil its potential in the 21st century. The objectives are to reduce transaction costs, create a provenance network for both wholesale and retail, and embrace digital technology.

This ambitious plan is more likely to work with firms in collaboration than in competition. A single platform would lead to a deeper market where transactions could be hundreds of tonnes or just a fraction of a gram. This combination of cutting-edge technology, combined with the timeless store of value, will herald a new chapter within economic history.

Charlie Morris is the editor of *Atlas Pulse*, a newsletter focusing on gold, disruptive technology and blockchains. He is also the CEO and founder of CCData.CC, a start-up that will provide econometrics for blockchain applications.

Prior to April 2015, he spent 17 years at HSBC Global Asset Management as the Head of Absolute Return, managing a multi-asset fund range. He is a familiar face in the financial media, with more than 200 appearances on CNBC. In 2012, he addressed the London Bullion Metals Association at its annual conference in Hong Kong about the three criteria to determine a gold bull market. In late 2012, that model signalled a bear market – something that still stands.

Prior to a career in fund management, Charlie was an officer in the Grenadier Guards. He recently completed the Camino de Santiago, a 500-mile walk across Spain.

The Legend of King Richard "the Lionheart" and the origins of the Austrian Mint (continued from the front page)

The song on the front cover is the song with which, as legend has it, the faithful minstrel Blondel found his imprisoned master King Richard "the Lionheart" in 1192. Through music, he unwittingly played a hand in the foundation of the Austrian Mint. Having made a truce with Saladin at the end of the Third Crusade, King Richard I "the Lionheart" headed home to England from the Holy Land by sea. When bad weather forced him to travel overland from Italy, he was later captured near Vienna by Duke Leopold VI of Austria, whom Richard had previously insulted by dragging the Austrian standard through the dirt after the siege of Acre, and haughtily rejecting the Duke's demands for a share of the booty.

When the Duke heard that Richard had been seen on Austrian lands, he ordered his capture. In Vienna Richard drew attention to himself by settling his bill at a local tavern with large quantities of Levantine money, and was promptly arrested and imprisoned in the castle of Dürnstein on the banks of the Danube.

The legend goes that Richard's loyal minstrel Blondel searched for his master from castle to castle by singing a song known only to him and the King. After a year of imprisonment in Dürnstein, Blondel eventually located Richard when the King was heard singing the song back to his minstrel. His release was secured in 1194, though not until Duke Leopold had been paid a ransom of some 15 tons of silver. The Duke used his part of the ransom to modernise the fortifications of Vienna, Enns and Hainburg, and found the city of Wiener Neustadt. It also funded the creation of the Vienna Mint in 1194, where the remaining silver was struck into coins. The tale of Blondel and Richard "the Lionheart" is one of Europe's most abiding legends, but the rest, as they say, is history.

Let it Flow Down the Long Grey Line: The 2014 West Point (U.S. Military Academy) Class Ring Memorial Melt

By Elizabeth Ferry, Professor and Chair, Department of Anthropology, Brandeis University

The 29 donated rings in the crucible

In a light-industrial district of Warwick, Rhode Island stands a long, low concrete building. It is much like the surrounding buildings, with shipping bays, offices with windows, numerous vents and a large chimney, but with a more spruced-up presentation than its neighbours (with actual spruces!) and a sign in front discreetly announcing its business: Pease & Curren Refiners.

Pease & Curren has served jewellery makers, pawn shops and dental laboratories since 1916. It receives jewellery, plate and scrap from its clients and refines these to extract gold, silver, platinum and palladium.

On 24 February 2014, Pease & Curren provided its refining service in a different context, by hosting the 14th Annual United States Military Academy at West Point Class Ring Memorial Melt. Each year since 2000, West Point graduates and the families of deceased graduates have donated their gold class rings to be melted down and joined with a gold sample from which future class rings will be forged. So far, 356 rings had been donated. Because shavings from the ingots of each Ring Melt ceremony are included when forging the new rings each year, each new class gets gold from all the preceding years of the ring melt. The industrial process of turning solid gold into liquid and back again is a central part of the ceremony.

It is especially notable that this new tradition has been created by USMA graduates, since the custom of class rings, widespread among colleges and high schools in the United States, started at the USMA in 1835. The ring is typically worn on the right hand, with the insignia facing towards the wearer until graduation and then facing outward afterwards. West Point graduates often wear their ring on the left hand in keeping with the idea that the left ring finger is connected to the heart.

Saluting the rings

About 50 people were in attendance, with several groups dominating: cadets from the class of 2015 (whose rings will contain the gold being melted today), members of the class of 1965 (the class from 50 years before are particularly encouraged to make donations) and family members of the ring donors. Lying flat on a table in front of the United States national flag were framed biographies of each of the 29 donors, with the donor's ring placed at the top left-hand corner. In the centre of the table stood a grey crucible about 10 inches high, looking like a cross between an industrial object, tombstone and reliquary.

> *"Each time a ring was placed, someone gave a short address that brought together themes of body, time, kinship and gender bound up in this ritual of gold, fire and human lives."*

After a welcome from Kimberly Michalik, the president of Pease & Curren, the first part of the ceremony began. The cadets took turns reading the biographies of the 29 ring donors (all but three are deceased and the rings were donated by the families). If no family member was present, a designated classmate or other academy graduate placed the ring in the crucible. He (it is usually a he) saluted the ring and then returned to his seat in silence. When a female family member – a widow or daughter – placed the ring, she would kiss it before putting it in the crucible. Though I didn't know anyone there, the ceremony felt solemn and weighted with respect.

Each time a ring was placed, someone gave a short address that brought together themes of body, time, kinship and gender bound up in this ritual of gold, fire and human lives. Here are some of the things people said as the rings were placed.

"I believe the ring was his most precious possession. It is that that is going to pass on his legacy."

"Karl wore that ring day and night."

"My husband and his friends used to talk about whether to wear their rings into battle, because if they died, the ring might be lost. They all decided to wear the rings into battle."

"As I look at these young faces, I think that even though it is difficult to relinquish something we saw on his hand, we are pleased to pay it forward, to pass his ring on down and let it flow down the long grey line [the continuum of cadets and graduates of the U.S. Military Academy at West Point]."

After the reading of the biographies and the placing of the rings, the class president gave a final speech before the melt.

He said: "How do we feel about today? Everyone has been looking at the Jostens catalogue [the company that makes the class rings] and it's easy to get caught up in the different jewels, gems and diamonds – how can you have the flashiest ring in the room? But it's so much more than a piece of jewellery. It is a connection that honours the lives and the stories represented by this ring… By donating your rings, you are gripping hands with our class. We are humbled by your gift. We will never go our separate ways." The cadets brought the crucible to the floor of the refinery and everyone took photos as the crucible was placed in the forge, which is heated to 1,260 degrees Celsius.

As we waited, I talked with two widows about their decision to donate their husbands' rings. Had their husbands known about the ring donation programme? They had not, but both wives were certain they would approve. What about the gemstone in the ring, which donors are asked to remove before donation? One planned to put it in a setting for a pendant; the other liked that idea.

The gold is then poured into an ingot mold and cooled in water. It weighs about 23 ounces. Once cooled, it is officially handed over to the representative from Jostens. He will drive it to the Jostens factory and add it to the sample from which the next rings are forged. And so on down the long grey line.

> *"As we waited, I talked with two widows about their decision to donate their husbands' rings. Had their husbands known about the ring donation programme? They had not, but both wives were certain they would approve."*

It may seem odd that the graduates, or their families, would donate such a highly personal emblem of achievement to be melted down and mixed in with all the other donated rings. Not only will the donor or his or her family never see the ring again, but it will bear no physical trace of its former life as the mark of graduation from the United States Military Academy, a great honour and important milestone in personal and family history. That's not to mention that, notwithstanding the recent fall in gold prices, a gold ring is still far more expensive in 2015 than it was in 2000 when the tradition began (the cumulative average London PM Fix for 2000 was $279.11). Why would donors or their families want to give away this important and valuable keepsake so that strangers could wear it on their fingers and pass it down their family lines?

The Jostens representative holding the ingot with the cadets

The quotations above suggest the answer to this question. The class rings represent the connection to something bigger and more important than the individual person's history or that of their biological family tree. And is not a connection that is forged lightly, but through the hard work of completing the demanding academic and physical training of West Point, and serving as an officer in the United States Army. The ring itself is seen as a part of the wearer's body, particularly the hand and heart (both of which signify emotional and physical connection), and as a substitute for the wearer's whole body. Like the body, which breaks down after death and mixes into the earth, water and air, the donated ring is broken down into its elemental form and mixed back into the collective source. This, I believe, is what made the moment in the Ring Melt ceremony when the ring is placed in the crucible so moving, even for those of us who did not know its wearer.

Gold never goes away, and thus it is a fitting material to express at once the anguish of personal loss, and the comfort and higher purpose of social continuity.

Elizabeth Ferry is Professor of Anthropology at Brandeis University in Waltham, MA, USA. She is the author of Not Ours Alone: Patrimony, Value, and Collectivity in Contemporary Mexico (Columbia University Press, 2005) and Minerals, Collecting, and Value across the U.S.-Mexican Border (Indiana University Press, 2013). In addition to publishing in numerous academic journals, she has also written for the magazine Mineralogical Record and the blog for the Committee on the Anthropology of Science, Technology, and Computing (www.blog.castac.org).

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http://www.peaseandcurren.com/2010/03/the-history-of-the-west-point-class-ring-melt/ (accessed on March 2, 2014).
Photographs by Anthony DiNoto with the West Point Association of Graduates.
Thanks to Alec Spivack for telling me about the West Point Class Ring Melt.

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Acidless Separation: New Technology for Refining Gold and Silver

By Giovanni Faoro, Chief Executive Officer, IKOI Srl

The Acidless Separation® (ALS) project originates from a collaboration between IKOI Srl and Ekaterinburg Non-Ferrous Metals Processing Plant (EZ-OCM). The need for a 'green' process for precious metal refiners gave the two companies the idea of developing and patenting a new refining process and a new plant, starting from the process that had been used for many years at EZ-OCM. Over the past two years, IKOI has developed the process and the plant, and now the technology is ready to be used by refiners all over the world.

Background of the refining processes

Refiners currently use several refining processes to refine gold and silver, and in particular to separate these two precious metals. All these processes for separating gold and silver use acids or hazardous chemicals.

The most well-known 'crude' process is Metal Chlorination (Miller process), which is applied to a vast range of alloys and is used by many companies. The Miller process has many disadvantages; for example, it requires many structural and regulatory changes to ensure safety, and this entails the need for a major investment to cover the operating costs for the disposal of hazardous materials. The Miller process also entails high operating costs for the treatment of silver chloride. Another disadvantage is the slow recovery of precious metals from the sludge produced by the process.

IKOI Sr and Ekaterinburg Non-Ferrous Metals Processing Plant Engineers during the development of the prototype

A second option is to proceed directly with the Electrolysis procedure, but this type of refining process is only advantageous if the input gold alloy contains at least 80% to 85% of gold, otherwise the direct electrolysis procedure can prove very time consuming.

If the gold alloy does not contain the right proportions of gold and silver, then more silver needs to be added to obtain the optimum composition of the gold alloy. Electrolysis, like the Miller process, also incurs high operating costs for the disposal of hazardous materials and involves long precious metal recovery times, in this case, not from the sludge but from the solutions and the anodes.

The final process that we wish to analyse is Dissolution-Precipitation, such as in the process with aqua regia, which has the same disadvantages as the Electrolysis process except that the significant investment in metals is not necessary for this process.

The main advantage of Acidless Separation® (ALS) over the processes discussed above is its 'green' philosophy. In fact, ALS requires no chemicals, for example acids, chlorine or other hazardous materials, and it has zero emissions. Another advantage of this technology is its universal application, as the ALS process removes the limitations imposed by the composition of the input alloy.

> *"In 2013, a meeting between IKOI and EZ-OCM gave rise to the idea of developing, patenting and marketing the ALS technology, starting from the technology that had already been in use in the EZ-OCM plants since the 1990s."*

The Acidless Separation® machine is also quick and easy to use. It is a fully automatic process and is based on three operations, resulting in a reduction in labour and production costs. This is due to lower energy consumption and also the fact that not only are the precious metal recovery times considerably shorter, but there is also a saving on the costs of managing hazardous materials, which are not required by the ALS process. This process is also safer for staff and the environment, as well as generating a high yield and a rapid return on investment.

History of the collaboration agreement

In 2013, a meeting between IKOI and EZ-OCM gave rise to the idea of developing, patenting and marketing the ALS technology, starting from the technology that had already been in use in the EZ-OCM plants since the 1990s.

This idea originated from the fact that all the refining methods adopted across the world require the use of hazardous materials. The difference and advantage of the new process over the more established processes is that the process is based on the different degrees of volatility of the materials and therefore requires no chemical additives such as acids or other hazardous materials. Instead the ALS process separates the metals through sublimation of the more volatile metals (e.g. silver, zinc, lead and selenium), and thus allows these metals to be separated from the alloy through distillation and captured in a water-cooled collector.

EZ-OCM has used equipment based on these physical principles since the early 1990s. In 2013, EZ-OCM found the collaborator suitable for developing this technology. IKOI is one of the industry leaders in terms of the research and development of innovative technologies for the heat treatment of precious metals. The collaboration agreement is based on the fact that EZ-OCM manages the raw materials for the tests and analyses the results of the tests, while IKOI undertakes the research and development, design and construction of plants, marketing, sales and after-sales service.

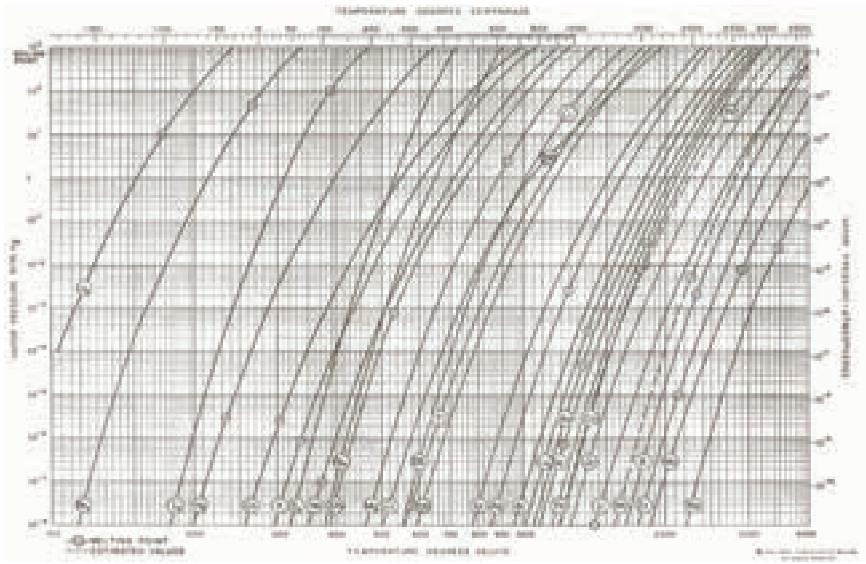
Research & development

Over the past two years, IKOI, with the collaboration of EZ-OCM, has designed and produced some ALS machines. The first step for IKOI was to study and analyse the correlation between the pressure and temperature necessary for the sublimation of the materials. Once IKOI had determined the temperatures and degrees of vacuum that were necessary for the machine, the company began to design the first prototype based in part on the machine already in use in the EZ-OCM plants.

A typical ALS plant consists of:

- A vacuum chamber with a maximum degree of vacuum of ~1x10^{-4} mbar;
- An overpressure of nitrogen or argon for the purging and rapid cooling of the hot parts;
- Two vacuum pumps, one two-stage rotary vane pump and one Roots pump;
- A touchscreen synoptic display equipped with software for managing and controlling all the parameters;
- An IGBT power generator;
- Two condensers (this technology is protected by a global patent): one for the more volatile materials and the other for silver, which is used to collect evaporated metals;
- One melting head.

Chart 1: Vapor pressure curves for the more common elements (cont.). After Honig (Ref. 5:14). (Courtesy RCA Laboratories)



The first series of tests was carried out at IKOI with a copper-silver alloy used for the similar vapour tension between copper and gold, as can be seen in Chart 1 above. Other tests were carried out with a three-component alloy using two condensers. This series of tests was carried out to check the movement of the crucible from the first condenser for the more volatile materials (such as zinc, lead and selenium) to the second condenser for the materials with an average degree of volatility (such as silver), while the less volatile materials (such as gold) remained inside the crucible.

When the Research and Development team at IKOI decided that the machine was ready to operate with a real gold alloy, IKOI sent the prototype to EZ-OCM, as stipulated in the collaboration agreement and, at this point, another series of tests began at its plants. These tests, which were followed by the Research and Development team at IKOI, identified the improvements to the machine that were necessary to make the operations performed at a refinery easier for the staff to undertake.

Results of the tests

We shall now explain the results of the first two series of tests. The first series of tests was carried out using one condenser only, while the second series of tests was carried out using two condensers.

The table below (see Table 1) shows the average initial composition of the gold alloys used for the two series of tests. After a few tests with the ALS technology, the results of the first series of tests (average values) only presented ~3% of silver in the block of gold that remained in the crucible, while the sublimated silver contained ~3% of gold.

The second series of tests using the ALS machine on a complex gold alloy gave surprising results:

- All the impurities (zinc, selenium and lead) in the first condenser were sublimated;
- The second condenser contained ~96.5% of silver and only ~2% of gold;
- The block that remained in the crucible had a purity of about 90% of gold, with ~5% of copper and another ~5% of silver.

Table 1: Composition of the two alloys of the first two series of tests

Alloy name	AuAgCu 60/30/10		Date	21/04/15
Meeting balance				
Median value of 25 trials	Weight g	Composition %		
		Au	Ag	Cu
Input raw material Au60/Ag30/Cu10	24,796.3	59.75	28.32	11.93
Block remained into the crucible (mainly Gold)	17,788.4	82.14	3.61	14.26
Material recovered from the condenser (mainly Silver)	6,980.6	2.91	91.10	5.99

Alloy name	AuAgZnSePbCu			Date	24/03/15		
Meeting balance							
Median value of 32 trials	Weight g	Composition %					
		Au	Ag	Zn	Se	Pb	Cu
Input raw material Au50/Ag35/Zn6/Se3/Pb3/Cu3	7,814.7	48.70	35.60	6.00	3.60	3.40	2.70
Block remained into the crucible (mainly Gold)	4,230.4	89.8	5.3	< 0,1	< 0,1	< 0,1	4.9
Material recovered from the condenser 1	1,084.6	0.05	13.55	40.6	23.2	23.7	0.03
Material recovered from the condenser 2 (mainly Silver)	2,424.1	0.23	99.7	< 0,1	< 0,1	< 0,1	0.07

Chart 2a: Correlation between time, pressure and temperature

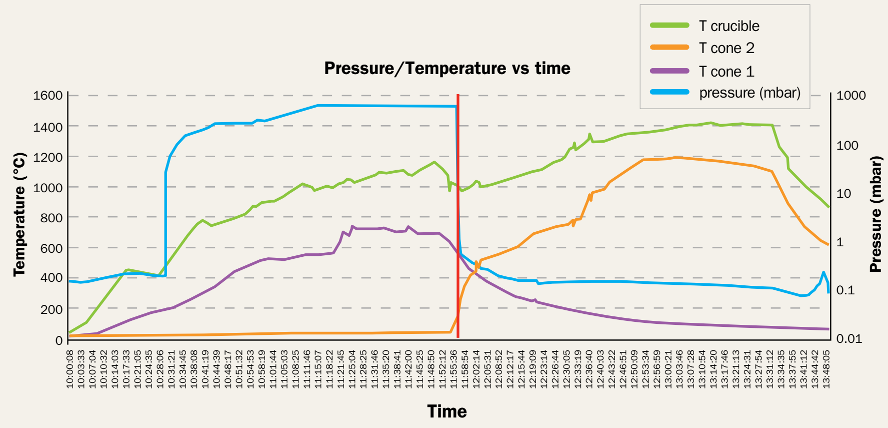


Chart 2b: Correlation between time and weight of the alloy in the crucible

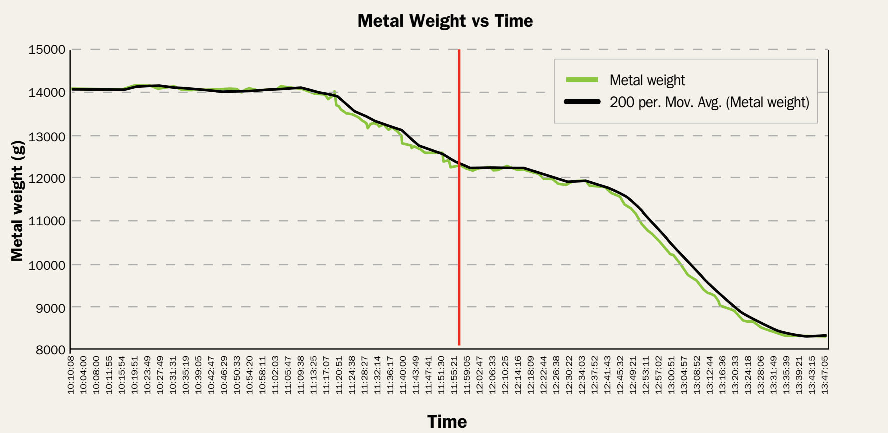
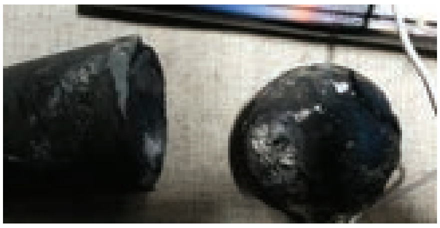


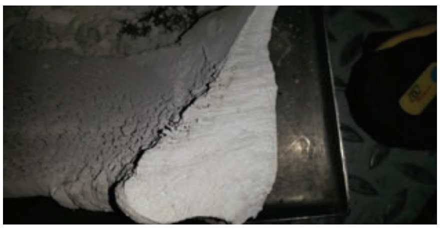
Chart 2 above is based on the second series of tests, the one with numerous impurities in the gold alloy. Chart 2a illustrates the correlation between time, the temperature of the crucible, the temperature of the diversion devices on the condenser units and the pressure inside the vacuum chamber. The condenser is changed at the height of the red line (see Chart 2 above) and, as the pressure decreases, the temperature of the first cluster diversion devices decreases and, at the same time, the second diversion device warms up as the temperature in the crucible increases. The zinc, selenium and lead are made to sublimate at a high pressure simply by increasing the temperature. After the transfer from the first to the second condenser, the pressure decreases in order to make the silver sublimate and to capture it in the second condenser.

Figure 4b shows the decrease in weight of the material inside the crucible, and the variation due to the sublimation of the silver is measured using a load cell. The transfer from the first to the second condenser is automatic and is set by the operator at the start of the process. This happens when the more volatile materials have sublimated completely and have been captured in the first condenser. The operator will know when this happens on the basis of the initial composition of the gold alloy and its initial weight.

Figure 5 shows some examples of gold alloy and the results obtained following the Acidless Separation® process. Figure 5a shows the billet of the six-component gold alloy that was input and treated during the second series of tests; figure 5b depicts the materials (zinc, selenium and lead) captured in the first condenser; figure 5c illustrates the silver which is captured in the second condenser (purity of about 98%) and figure 5d shows the block of gold and copper that remained inside the crucible.


5a


5b


5c


5d

Figure 5: Alloy dorè before Acidless Separation® treatment and results of the process

Marketing programme

For refineries interested in this process, some tests can be carried out using their own gold alloys. On the basis of the results obtained from the tests and the refiner's alloys, the ALS process and ALS plant can be designed and implemented with the right shape of condensers, the right power and some other special features suited to the refiner's alloys. By knowing the composition of the gold alloy and on the basis of the results of the tests, the specific OPEX values of each refiner can be calculated.

The Acidless Separation® process and plant are protected by a global patent.

Giovanni Faoro is currently CEO of the IKOI and GHT companies. He has worked on metallurgical heat treatment and melting of precious metals since 1979, and has over 36 years of experience regarding on technology of melting, crystallization and physical separation of pure and alloyed precious metals. He holds several patents in the field of melting, casting, metallurgy and physics relating to precious metals.

With regard to the projects in which he is involved he works closely with the University of Padua - Department of Metallurgy (DIMEG), the Italian National Research Council (CNR) and the Ekaterinburg Non-Ferrous Metals Research & Engineering Center LLC EZOCM. In 2013 he was appointed Prime Contractor and chief of the Industrial Project Plant for the construction of the Kazakhstan Government new Refinery at Astana.

He is currently the Head of the Flameless Tunnel® and Acidless Separation® project development teams.

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John Coley – 'From the Rock in the Ground to the Ring on Your Finger.'

Interview by Dr Michele Blagg, Research Consultant and Visiting Research Associate at the ICBH, King's College, London

As part of the LBMA's Voices Project Michele interviews John Coley as he reflects on his career in the bullion market. John was closely associated not only with the London Bullion Market for many years, but also the LBMA where he chaired the Public Affairs Committee and also edited the Newsletter, the forerunner of the Alchemist.

It was the late David Saunders, while he was a senior director at Sharps Pixley, who was responsible for John Coley joining the trading team as a clerk in 1970, where he eventually became a senior bullion dealer. David, a neighbour, mentioned that the company was looking for a young lad to come and make tea and learn the ropes.

David Saunders who helped John secure a junior position at Sharps Pixley in 1970

John explained that "this was in the days when the old boy network was just as good as a CV. I may never have been able to get the job in the first place. The old boy network is alright for some things, but I soon realised it puts pressure on the other person as well." There was a degree of pressure on both David and John, who felt that if he wasn't doing a good job or if he made any errors these would reflect on David.

When John was promoted to being a fully-fledged dealer, he remembered telling David: "I always said that you didn't have to be accurate or tidy as a clerk." David said:

"Yes but we couldn't exactly say, 'Well done. You have been so awful at being a clerk, we are going to promote you to a dealer', could we?" Although everyone chipped in with John's training, Les Edgar gave him the most advice, and once John proved himself capable, more responsibility came his way. John recalled "being left alone at lunchtime, because in those days lunch breaks were compulsory, and completing the first ever trade on my quote. I can still to this day feel that twisted gut feeling of 'Oh God, right, now what am I going to do? Breathe deeply.' I always remember that!"

John recalled that he remained a trainee dealer's clerk for six months, then worked in the back office for the next two years learning the ropes, before heading back to the dealing room as a proper dealer's clerk for a year. John and his fellow trainee, Mike Jennings, were both taught to run the book, waiting and biding their time before filling "dead men's shoes". People did leave though, and John and Mike must have shown sufficient initiative as they were bumped up to the position of dealers and ran the silver book together.

Reflecting on his time as a trader in the silver market of the mid-1970s, John described the trading desk as:

"Busy, but it was rather a different type of busy to 10 years ago, which was different to being busy today; however, there was enough to make you worry about it. The amount of money in the market wasn't the same. There were fewer people trading in those days, no brokers. There were mad days, there were always mad days, and you never knew when they were coming and that was the beauty of it, and that has always been the case. You can't let your guard down at any time. That burst of adrenalin must be there just below the surface for when it is needed, because if you don't react quicker than the last person, you are dead! So you need to be just bubbling under the surface."

The happy partnership continued until Mike left Sharps Pixley, which gave John full responsibility for the book. He gained more exposure and became senior silver trader as people retired or left. Neil Newitt went to Hong Kong, Graham Kendall left, and Alan Baker joined and took on the gold book. Nigel Munt came along and worked with Alan, then Ernie Watkins joined John on the silver book. John spoke of his rise through the ranks as:

"A natural progression. After that we had a lot of very good young traders come through, but there was this thick crust at the top of old guys who wouldn't get out of the way. There was Les, Nigel, Alan and myself. A number of people who had learnt the ropes at Sharps Pixley left and became very senior elsewhere in the market, because there was no prospect of getting rid of us old lot."

" The happy partnership continued until Mike left Sharps Pixley, which gave John full responsibility for the book. He gained more exposure and became senior silver trader as people retired or left. Neil Newitt went to Hong Kong, Graham Kendall left, and Alan Baker joined and took on the gold book. "

The Sharps Pixley Management team circa 1977, John is pictured second from the left.

The close knit team of the dealing room forged a strong bond. At busy times, the bullion desk would be really noisy and the atmosphere electrifying. People on the other trading desks would stand up out of interest to see what we were doing. During these busy periods, the team drew closer together.

"We wouldn't accept payment by cheque, but we would take a banker's draft. When the banker's draft was received, we would always phone the bank to confirm it. Unbeknown to us, as we rang the bank and Mocatta rang the bank, somebody answered from a hole in the road or something, and said 'Yes, we are the bank and that is ok', and they walked away with 1,000 krugerrands and of course they were false bank drafts."

John shared his experience of the trading room as being one of:

"Highly organised chaos. Within that organisation, you had certain people responsible for different products. You would all deal in those different products, but only under reference to the person running that particular book. If somebody wanted a gold price, you didn't put him on to the gold dealer, you referred to the gold dealer. If the gold dealer needed the silver price, he referred to the silver dealer. Equally with platinum, coins or whatever. You were all part of the team and all quoting everything, and if you were worth your money, you would know exactly where the others were with their position and what they were looking to do, and be totally aware, because it could very well be that if your market was manageable, you could really throw your weight behind busier colleagues. If the gold dealer wanted a gold price, he would just yell out 'Get me gold' and everybody jumped to the phones, or the Reuters machines in those days, and got the quotes. He was like the conductor and you were the orchestra."

Knowing what rival firms were doing and staying ahead of the competition was essential. John spoke of the friendly rivalry in the market: "You needed liquidity, you needed their pricing and they needed your pricing, so you had to keep good relations… It seems funny to talk about this in today's regulatory society. It was incredibly proper but friendly."

Annual cricket matches were one way of reinforcing this friendship, although one match in June 1983 particularly stands out in John's mind as eventful, but for all the wrong reasons. At the time, both Sharps Pixley and Mocatta and Goldsmid had coin rooms and would sell up to 1,000 krugerrands over the counter without any problem. John shared his memory of an incident where both firms were conned out of gold coin:

"We wouldn't accept payment by cheque, but we would take a banker's draft. When the banker's draft was received, we would always phone the bank to confirm it. Unbeknown to us, as we rang the bank and Mocatta rang the bank, somebody answered from a hole in the road or something, and said 'Yes, we are the bank and that is ok', and they walked away with 1,000 krugerrands and of course they were false bank drafts. Somehow we spotted the problem. My recollection was that it was a high street bank and we had to convince them that there was a problem. That all happened and blew up the same evening that we were both playing cricket. It was even mentioned in The Sun!"

Thankfully, the loss was not borne by either firm.

Mocatta and Sharps Pixley both had good reputations as family firms that took care of their people. Both managed to keep their respective owners at arm's length for a time. Mocatta had Hambros then Standard Chartered, which then became Scotia, while Sharps Pixley had Kleinwort Benson, which in the mid-1990s sold to Deutsche Bank. John noted that this was "the corporate way of doing things in those days – getting bigger and bigger". Trading systems became more sophisticated. John joked that it moved from "the back of a cigarette packet to fully online"; however, "dealers still liked their paper trails… everything was still recorded on paper and then input [by a clerk]… We claimed in the dealing room that we were too busy dealing to input as well." With information at their fingertips for stock control and credit control, daily reports were generated; it allowed dealers to accurately pinpoint their liquidity position.

John left the dealing room at Sharps Pixley in 1997. After a short stint at Mitsui, he took up a very unusual offer from Brinks. It didn't want him to drive a truck, but it did want someone who could talk to its customers and who knew the business. After some considerable negotiations with his new employers, John thought that "this might be rather interesting". He described his new role as:

"Absolutely fascinating. I don't know anybody else who has been in the market, who has been an active trader and then was suddenly able to see what everybody else was doing. I remember my first week there. There was a whole load of gold coming in, from a part of the world it came in from occasionally, and I remember thinking: 'It's you! I wondered what it looked like!' People would come along and talk to me knowing that I was no longer a threat to them. So for 27 years, I had been wondering who was doing what and, suddenly, not only did I find out what was going on, but they would talk openly about it and I couldn't tell anyone!"

"The rare insight John gained from working on a trading desk and for Brinks meant that he was able to tell his new employers what it was really like to be a dealer and, equally, he could tell the dealers what it was really like on the shipping side."

Because John knew the market, he would be in a position to anticipate when there might be a chance for arbitrage business between New York and London regarding silver. He often called his clients ahead of competitors and gained the extra business. The job was unique because it gave John a terrific insight into the market. There were a lot of people there who were dealing with the movements of metal, but they didn't understand why it was moving and what the traders were thinking. John could see both worlds and found that intellectually very interesting indeed.

The rare insight John gained from working on a trading desk and for Brinks meant that he was able to tell his new employers what it was really like to be a dealer and, equally, he could tell the dealers what it was really like on the shipping side:

"Fog does exist, strikes happen and planes are delayed. It's the real world! In the dealing room [the commodity] is just numbers but to other people it's real… From the rock in the ground to the ring on the finger, there is a big supply chain. It goes from commodity to financial product to commodity. At the start, it is only traded and physically moved once at each stage of the trade. It's in the middle that it is traded hundreds of times in this 'cloud'.

One of the early editions of the LBMA Newsletter which John edited. This was edition number 17, from June 1991, and was published to co-incide with the FT Gold Conference in Vienna.

Then it comes out the other side as a commodity again… Trading people should never lose sight of the fact that they are a small part of a big process."

"Looking back on his career, John shared that the most outstanding thing from his time working in the market was the camaraderie: "It's the people that one remembers."

During his time in the market, John was heavily involved with the LBMA. On one occasion, while sitting on the Public Affairs Committee, he made the mistake of pointing out that the newsletter could do with updating. Unable to make the next meeting, he later learnt when reading the minutes that he was now in charge of the newsletter, which was the forerunner of the Alchemist. John reflected on how much fun it was to produce the newsletter and how he "tried to make it a bit more user-friendly. It had cartoons, it had an editorial comment, written tongue in cheek by Gold Bug, which I called myself." He also organised the biennial dinners for 10 years. The one that stood out was at the Natural History Museum, with Sir Eddie George as guest speaker. John described the venue as "a wonderful place with smoke and a huge dinosaur and the grand steps. It was very impressive, a wonderful evening." Although having drawn up a seating plan for more than five hundred people, he had to rejig it and reorganise the top table when a senior banker turned up unexpectedly as everyone else was drinking champagne. It was a bit hairy! At the end of the evening, John didn't want to leave. Along with the owner of the catering company and his contact at the museum, he sat and polished off another bottle of champagne, not wanting to go straight home as he had lived and breathed the event for such a long time.

John was also part of the organising committee for the annual cricket and golf days hosted by the LBMA. He recalled how these events brought the market together and that "the market was close knit, in the right way. There was nothing that broke any confidentialities, but you all needed each other because you were all in the market together and you depended on each other's liquidity."

Looking back on his career, John shared that the most outstanding thing from his time working in the market was the camaraderie: "It's the people that one remembers."

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.

The LBMA Biennial Dinner at the Natural History Museum, June 1994, which John organised.

Gold Banking and Investment Culture in Turkey

By Erman Dönmez, Chief Executive Manager of IGR Global and Evren Yasar, Gold Banking Manager of the Istanbul Gold Refinery (IGR)

Gold has been used for centuries for jewellery purposes and as a savings vehicle. The features of gold that distinguish it from many other minerals are its ability to be converted into different forms due to its easy processing, its being one of the best conductors in nature, its use in many areas of industry due to lack of corrosion, its being an indispensable material in the making of jewellery and ornaments, and its store of value.

We believe that one of the most important reasons why gold is accepted as a store of value is that gold does not represent anyone's debt. Today, national currencies are a form of debt security for the countries in which they are printed. Therefore, with all transactions carried out in a particular currency, you are effectively taking on the risk of that country. Gold is not tied to any particular country, but is a store of value which is internationally accepted and which is almost completely independent from political risks. Therefore, gold is considered to be somewhat of a safe haven in either periods of crisis or political instability.

Gold is part of a centuries-old savings and investment culture in Turkey. Due to the financial system only recently developing in Turkey, and with low financial literacy and a lack of freely available information about other investment opportunities, people have tended to invest in gold. This is both easy to achieve and familiar to people who have turned to gold historically from generation to generation. Physical gold, seen as a traditional means of saving by households in Turkey, is typically kept under the mattress rather than held with banks.

Gold has an important place in Anatolian culture: it is used both in jewellery and as an investment tool. Until the liberalisation in the 1980s, gold prevailed for centuries as almost the sole store of value and investment opportunity. Since the 1980s, investors, despite having been introduced to other investment opportunities (such as foreign currency and other financial market instruments), have not removed gold from their investment portfolios.

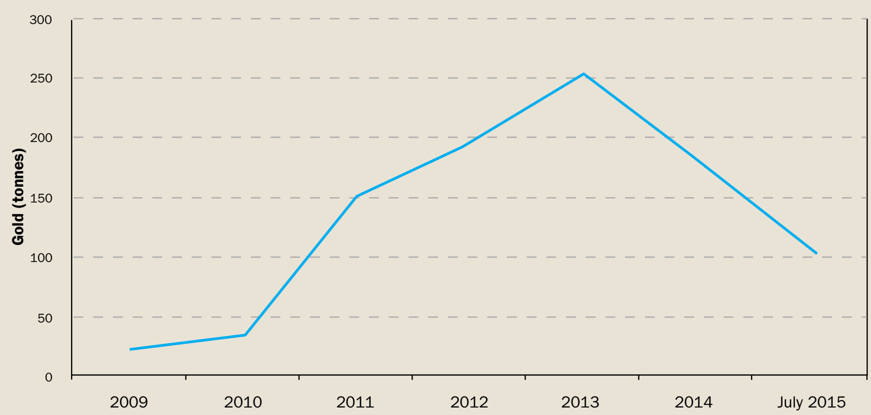
Traditionally, gold has been regarded in Turkey as a safe haven in periods of financial crisis. There are many reasons for this, including for example, local jewellers being trusted and respected, gold owners not having sufficient information regarding other investment opportunities and also the erosion of trust in the banks during the 1990s through to the beginning of the 2000s.

Turkish people have been accumulating gold for centuries, and this gold is generally stored in a safe location in their own homes, for example, in safety deposit boxes and in the form of jewellery from reputable jewellers. As a result of this form of storage, gold remains outside of the economy and therefore the value of gold held as savings cannot be easily calculated.

In 2008, the banks began to offer a new product to customers – gold accounts denominated in either 24 carat, 995/1000 or 1000/1000 purity. Interest in these gold accounts began to develop, particularly as the price of gold increased as a result of the global financial crisis. This resulted in a shift away from gold being held under the mattress to being held on deposit in banks.

From 2009 to 2013, there was a sharp increase in the amount of gold held on deposit in banks in Turkey. But having peaked at 253 tonnes by the end of 2013, within 12 months, deposits had fallen to 181.8 tonnes with a value of $US6.98 billion. And in the period December 2014 to January 2015 alone, there was a 50-tonne reduction, representing a decline from $US6.98 billion to $US4.75 billion.

Chart 1: Total Deposits of Gold Held in Turkish Bank Accounts (tonnes)



> *"Approximately 50 tonnes of physical gold has been collected since 2011. That amount is now inside the banking system."*

However, banks' gold accounts were not enough in themselves to bring 'under the mattress gold' within the formal-registered financial system. In 2011, under the leadership of the Istanbul Gold Refinery (IGR), a new project was launched in partnership with the banks. This project enabled people to bring their physical gold to the bank branches, where IGR experts would value the customer's or potential customer's physical gold in the bank branch and then transfer the equivalent value of pure gold direct into their gold account. The IGR started this project with one bank in 2011 and, since then, the project has been extended to 11 major banks, which are now involved in collecting scrap gold from the public.

Approximately 50 tonnes of physical gold has been collected since 2011. That amount is now inside the banking system.

Why is it so important for gold stored under mattresses to be contributed to the economy? There are several benefits; for example, it can:

- lead to an increase in savings rates
- contribute to the reduction in the foreign trade deficit
- increase liquidity in the economy
- ensure that the sector of the public who have not previously worked with the banks are included in the financial system
- allow the central bank to experience a significant increase in reserves.

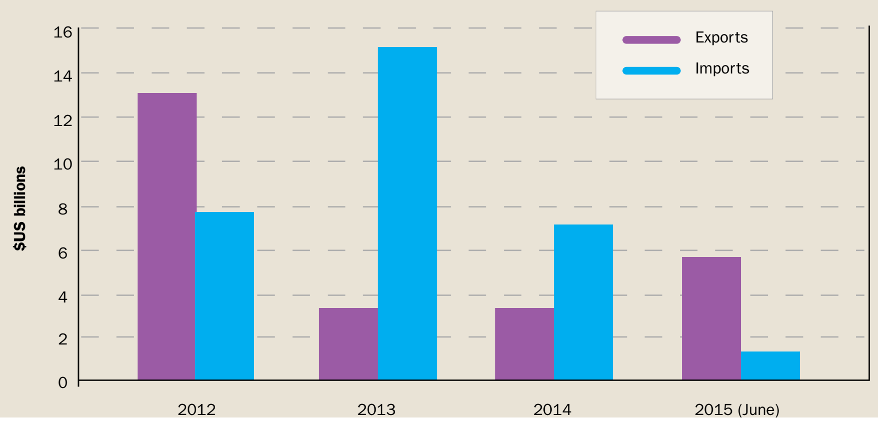
The low savings rate in Turkey is an issue that has become a chronic problem in recent years. One reason for the savings rate being so low in official reports is that a significant proportion of current savings are held outside the financial system.

The amount of gold estimated to be stored under mattresses

According to the study by the Turkish Central Bank published in October 2012, in 1984, the amount of gold remaining in our country (after allowing for import and export from production) was approximately 2,200 tonnes. Due to alternative investment tools such as foreign currency funds and savings deposits being very limited prior to 1984, savings were primarily held in the form of gold. In view of this historical stockpiling, it is considered that 5,000 tonnes is a reasonable estimate of the amount of gold currently being stored under mattresses. This is currently valued at approximately $US178 billion, which equates to approximately 22% of Turkey's gross domestic product and 40% of the total cash deposits held in banks.

One of the most important problems for our country for many years has been an increase in the foreign trade deficit. Depending on how much gold is brought out from under mattresses, Turkey could move from being a country that imports gold to an exporter of gold. If just 1,250 tonnes of gold, representing 25% of the estimated 5,000 tonnes of gold held under mattresses, is brought into the economy, this would represent an injection of approximately $US45 billion, a value which exceeds our total current trade deficit.

Chart 2: Exports and Imports of Gold in Turkey ($US billions)



The main role of the banks in the financial system is to serve as a bridge between the sectors with excess resources and those with insufficient resources. This role is important for the sustainable growth of the country's economy. In order to ensure sustainable growth, investments have to be sustainable. Therefore, the manufacturing sector, which cannot carry out investment owing to insufficient funds, has to rely on the banks for its funding requirements.

This real increase in resources will be a very important tool for sustainable growth. In line with our growth target, the increase in the amount of credit required is around 15%. Developing countries have relied on resources transferred to them from the USA and Europe, having developed a policy in the growth of the money supply following the 2008 financial crisis. However, in the near future, it is expected that this policy will no longer be achievable due to changing market conditions and developments in global markets. In this scenario, if saving volumes continue to decrease for a number of years, the resource requirements of Turkey will increase. The physical gold collection project will provide increased resources for the country. The project should enable any gold physically held outside the formal-registered economy to move into the economy. This means that the collection of physical gold is not a transfer of resources, but an actual increase in resources.

In line with the gold collection marketing strategies of the banks, it will be possible to reach a wider audience who have previously only invested in gold and who are not bank customers, and introduce them to the banking system.

This policy may open the door to more people who have previously had a limited relationship with banks to avail themselves of different banking products. As a result, individuals who have previously kept their savings outside of the financial system will be encouraged to participate in the system and, by doing so, make an important contribution to increasing financial literacy.

Evren Yasar is the Gold Banking Manager of the Istanbul Gold Refinery (IGR). He began his career in Istanbul at the Kuveyt Turk Bank and for the next eight years worked in retail and small business banking, product development and marketing departments, before joining the IGR. His main responsibilities include managing the scrap gold collecting project in partnership with the banking sector and a range of other projects and gold banking products, such as ATM gold and gram gold. He gained a Bachelor's degree in Economics and a Master's Degree in Banking from the University of Instanbul.

Erman Dönmez is the Chief Executive Manager of IGR Global (International Department of the Istanbul Gold Refinery Inc.). He began his career at the Istanbul Grand Bazaar working in his family's jewellery business. After completing his studies at University, he joined the Saat&Saat Group in 2004, an authorised distributor of watches and jewellery. In 2010 he joined the IGR and helped to set up the International Department which subsequently opened IGR branches in Germany, Spain and Dubai. He is responsible for managing a range of bullion trade related activities, the marketing of small bars and handling contracts with mining companies. He has a Bachelor of Arts in Business Administration.

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12 SIMPOSIUM INTERNACIONAL DEL ORO Y LA PLATA

INTERNATIONAL GOLD & SILVER SYMPOSIUM

LIMA, PERÚ 17 - 18 MAYO / MAY 2016

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Sociedad Nacional de MINERIA PETROLEO Y ENERGIA

PROMUEVE / PROMOTED BY:

BANCO CENTRAL DE RESERVA DEL PERÚ

PERÚ Ministerio de Energía y Minas

THE SILVERINSTITUTE

WORLD GOLD COUNCIL

Trains, Planes and Automobiles

By Aelred Connelly, LBMA Public Relations Officer

As well as regular meetings with members and market participants the LBMA Executive is undertaking an ever increasing number of regular meetings and trips abroad to speak at industry related events to spread the word about the work of the association as well as to forge ever closer working relationships with local bullion markets. By train, plane and automobile, over the past 12 months, the Executive team has travelled to industry related events and meetings in many places, including Peru, Singapore, Russia, Kazakhstan, USA, DRC, France, China and India.

In June, Ruth Crowell spoke at the 39th IPMI Conference in San Antonio and later that month the LBMA held a Bullion Market Forum in Shanghai in association with the Shanghai Gold Exchange. In August the Executive visited Delhi and Goa for a series of meetings with senior representatives of the regional bullion market. Grant Angwin delivered the Keynote Speech at the 12th India International Gold Convention in Goa. In September the Executive attended a series of industry events in New York during Platinum week and co-hosted with the LPPM a cocktail reception in New York on the 17 September. Everywhere the Executive team members go, they are reminded of the issues facing local markets and the truly global nature of the bullion market.

In addition to the on-going work of the Association in relation to Good Delivery, RGG and Precious Metals Prices, the attention of the Executive is increasingly focused on implementing the EY Strategy Review. The next step is to scope out the key deliverables and a timetable for implementation.

As well as spreading the word about the work of the association, the Executive is building bridges and developing initiatives with local bullion markets. You can read about one such recent initiative with the SGE on page 21.

2015 - LBMA Events and Executive Trips

The following is a summary of the key meetings and events attended by the LBMA Executive team during the course of the year.

21 January	**European Commission and European Parliament Meeting, Brussels** Discussed issues of mutual interest regarding Responsible Gold.
29-30 January	**Trip to India** Met with senior industry representatives including officials from the Reserve Bank of India and local industry representatives in both Mumbai and Delhi.
8-10 March	**6th LBMA Assay & Refining Conference, London** A review of this event appeared in edition 77 of the Alchemist (May 2015).
12-13 April	**DPMC Conference, Dubai**
17 April	**3rd Global Conflict Minerals Compliance and Supply Chain Due Diligence Conference Berlin** Delivered presentation on the LBMA's RGG programme.
4-6 May	**OECD Meeting in Paris to discuss Due Diligence and Responsible Gold Guidance** Met industry counterparts to discuss mutual due diligence related matters.
4-5 June	**Precious Metals and Rhenium Consortium Meeting, Milan.** Met with industry representatives.
14-16 June	**39th IPMI Conference, San Antonio, USA** Delivered presentation on the work of the LBMA.
17-18 June	**6th International Astana Mining & Metallurgy Congress 2015, Kazakhstan** Delivered presentation LBMA RGG initiatives. Also met with a number of senior industry representatives, government and central bank officials.
25 June	**LBMA Bullion Market Forum, Shanghai, China** Speeches delivered by Ruth, and the Chairman and Vice-Chairman of the LBMA.
16-19 August	**Trip to Delhi** Met with the Reserve Bank of India and the Indian Ministry of Finance, General Bureau of Indian Standards and a range of local industry representatives.
20-23 August	**12th India International Gold Convention, Goa** Delivered presentations at the event and conducted a series of meetings with senior industry representatives.
1 September	**Guandong Precious Metals Exchange** Visited the LBMA in London to discuss mutual co-operation in relation to Good Delivery issues.
9 September	**Russian State Assay Office and the Russian Association of Precious Metals Refineries** Visited the LBMA in London to discuss mutual co-operation in relation to Good Delivery issues.
11-19 September	**New York Platinum Week** Series of meetings with senior industry representatives and also attended a number of industry events.
23 September	**Workshop on Conflict Minerals at the European Parliament** The LBMA attended to discuss the implementation of the LBMA RGG.
18-20 October	**LBMA/LPPM Precious Metals Conference, Vienna, Austria** For the first time the entire LBMA team will be in attendance at this year's conference. We look forward to seeing you all in Vienna.

The LBMA has organised a series of webinars during 2015, designed especially for LBMA Members, in order to better inform them and communicate LBMA initiatives and projects in a consultative fashion.

The first webinar in the series took place on Monday, 27 April. It was hosted by Ruth Crowell, Chief Executive, and Sakhila Mirza, General Counsel, and introduced Members to the LBMA's strategic review of the bullion market. Further seminars have been held during the year, see details below. Recordings of the webinars are available in the Media Centre section of the LBMA's website. Additional webinars are planned over the coming months, watch out for further details on the LBMA's website.

27 April	**Strategy Review, FEMR and benchmark prices**
22 July	**Strategy, FEMR and LBMA Prices**
02 September	**Responsible Gold Guidance Version 6**
16 September	**US Regulations in the Precious Metals Market (hosted remotely from New York)**

Kilobar 9999 Standard

By Neil Harby, LBMA Good Delivery Officer

Following the joint meeting between the LBMA and the Shanghai Gold Exchange (SGE) at the recent LBMA Forum, which was held in Shanghai, the 9999 gold kilobar specification was issued (see table for details).

The kilobar standard focuses on the fineness of the gold and allows for the inclusion of all existing refiners' current production, including all SGE and LBMA accredited refiners. It also streamlines the information on Certificates of Analysis to focus on the critical information required. We would hope that this joint recognition of a single standard will greatly assist our mutual members trading in Shanghai and in other 9999 kilobar markets around the world. This type of initiative demonstrates the type of co-operation and, ultimately, mutual endorsement that we are striving to create between gold markets, and I hope that we can work together with markets around the world to broaden and strengthen standards.

The LBMA is now working with exchanges within India to produce a 9950 gold kilobar specification.

Specifications for a 1kg 9999 Gold Bar ('four nines kilobar') (as endorsed by the LBMA and SGE)
Weight: 1000g minimum
Dimensions: The kilobar should be rectangular. The dimensions should fall within the following ranges: Length: 80 – 120mm Width: 40 – 60mm Height: 7 – 14mm
Fineness: The minimum acceptable fineness is 999.9 parts per thousand fine gold.
Marks: Refiner's stamp or logo Serial number Weight (1kg or 1000g) Fineness (to four significant figures) Certificate of Analysis (COA) A Certificate of Analysis must accompany each kilobar on dispatch from the refiner and must include the following information: Refiner's stamp or logo Serial number Weight (1kg or 1000g) Fineness (to four significant figures) Approved signature
Notes: Serial numbers must be unique and non-reusable. Serial numbers must be referenced against inventory lists to provide traceability. Specifications are for cast bars.


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Regulation Update

By Sakhila Mirza, LBMA General Counsel

Responsible Gold Guidance (RGG)

It has been three years since the LBMA launched its Responsible Gold Guidance (RGG). Both the refiners and auditors have worked diligently during this time to understand the requirements and to ensure that the LBMA RGG has been implemented successfully.

Version 6 of the LBMA RGG was released in August 2015. It includes a requirement for country of origin disclosure (which will not be publicly reported), a reduced time-frame for site visits to higher-risk sources, as well as some corrections, alignments and clarifications. A webinar walking through the new version was held on 2 September 2015 and a recording of it is available on the LBMA's website.

In line with the guidelines, all refiners are granted a three-month window immediately following their financial year end to submit an independent audit report to the LBMA. We are pleased to report that all 73 Gold Refiners refiners have successfully passed their 2014 audit under the programme.

Other regulation news

Basel III: The LBMA, together with the WGC, have met with EBA twice this year. The most recent meeting took place on 9 September 2015, where the WGC, LBMA and a number of bullion banks met with the European Banking Authority (EBA). Back on 31 October 2014 the Basel Committee on Banking Supervision (BCBS) published its final report on the Net Stable Funding Ratio (NSFR) under Basel III. The report included a revised version of the required stable funding (RSF) factor for a number of assets, including gold. Gold's haircut had been increased from 50% in the 2010 proposal to 85%. At the meeting with EBA, those in attendance expressed their concerns on the impact that the 85% haircut would have on both liquidity and the cost of doing business, which would impact the end users, such as refiners (amongst others) significantly. Costs will be transferred to clients, making it very expensive to do business and market liquidity will fall as a result of firms seeking to reduce their gold holdings. EBA has requested further quantitative data on the impact that a 85% haircut would have. In particular EBA would like to receive more illustrative examples, supported by quantitative data, and provide any information on how accounting treatments may impact the NSFR. The EBA was very clear that, without the requested data they cannot consider recommending a re-assessment. In addition, there is a public hearing on the matter, which is scheduled for 15 October 2015.

European Financial Services Regulations: On 28 September 2015 the European Securities and Markets Authority (ESMA) published its financial technical standards on the Markets in Financial Instruments Directive (MiFID II) and the Markets Abuse Regulation. These technical standards will help stakeholders to understand how the legislation will apply in practise to market participants, market infrastructures and national supervisors. The new technical standards of the European financial markets by increasing their transparency, providing for fairer, safer and more efficient markets and also supporting stronger investor protection.

DIARY OF EVENTS 2015/16

OCT

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

22-25
Singapore Jewellery and Gem Fair
Sands Expo and Convention Centre
Singapore
www.singaporejewelleryandgemfair.com

26-27
The Precious Metals Investment Symposium
Four Seasons Hotel, Sydney, Australia
http://syposium.net.au/pm/

27-29
Saudi Mining & Minerals 2015 Symposium
Al-Faisaliah Hotel, Riyadh, Saudi Arabia
www.saudi-mining.com/conference

28-29
The Silver Institute: 2015 Silver Industrial Conference
Washington DC, USA
www.silverinstitute.org/

NOV

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

07
London Coin Fair
Holiday Inn, London
http://www.coinfairs.co.uk/london-coin-fair.aspx

25
9th Swiss Mining Institute Conference
Baur au Lac, Zurich
http://swissmininginstitute.ch

26
9th Swiss Mining Institute Conference
Mandarin Oriental Hotel, Geneva
swissmininginstitute.ch

28
Gold, Bears & Traders 2015
Queen Elizabeth II Conference Centre
Westminster, London
www.goldandbears.com/

30 – 04/12
Mines & Money London
Business Design Centre
London, UK
http://london.minesandmoney.com/

DEC

09-10
10th China Gold & Precious Metals Summit 2015
Shanghai, China
www.chinagoldsummit.com/

2016

JAN

24-27
Inside ETFs
Diplomat & Spa, Los Angeles, USA
http://www.etf.com/inside-etfs-conference/index.html

FEB

08-09
121 Mining Investment
Welgemeend, Cape Town, South Africa
www.weare121.com/121-events/

MAR

14-18
Mines and Money Hong Kong
Hong Kong Convention & Exhibition Centre
Hong Kong
http://asia.minesandmoney.com/

APR

13-15
Mining Investment Asia 2016
Marina Bay Sands, Singapore
www.mininginvestmentasia.com/

16
UK Investor Show 2016
Queen Elizabeth II Convention Centre
Westminster, London, UK
www.ukinvestorshow.com/

18-19
121 Mining Investment, London
155 Bishopsgate, London
www.weare121.com/121-events/

JUN

11-14
IPMI 40th Precious Metals Conference
JW Marriot, Pheonix, Arizona
http://www.ipmi.org/seminars/

LBMA News

By Ruth Crowell, Chief Executive, LBMA

MEMBERSHIP

On 20 August, UBS Switzerland AG was admitted as an Affiliate Member.

On 20 August, Vintage Bullion DMCC was admitted as an Associate Member.

On 24 July, the Perth Mint was admitted as an Ordinary Member, as was Limpid Markets Ltd on 20 August.

These changes brought the membership to 152 companies, comprising 85 Members (of which 14 are Market Makers) and 67 are Associates.

GOOD DELIVERY LIST

On 17 August, the silver refinery of Chenzhou City Jingui Silver Industry Co., Ltd was 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 welcomed its newest members to their first meeting in September: Mehdi Barkhordar, PAMP S.A.; Allan Michael Finn, Malca-Amit Commodities Ltd; Chris Thompson, Sumitomo Corp. Global Commodities Ltd; and Sid Tipples, JP Morgan Chase Bank N.A.

The main focus of the Committee is reviewing the Association's Governance as well as the new suite of financial services which the LBMA will offer the market starting in 2016. These services will start with market-led trade reporting, as is in line with the Fair & Effective Market Review. To support these new services, the Committee will need to update the LBMA's legal structure and governance. The Committee will be recruiting Non-Executive Directors to give further firepower as well as enhanced governance to the LBMA.

The Committee has also created a new User Group which will engage with the wider trading membership to review the proposals in detail and inform the implementation timetable of the financial services. David Gornall, formerly of Natixis and Jon Spall of G-Cubed Metals will assist in terms of Member and service provider engagement.

The Committee has also been involved in reviewing the work of the Subcommittees outlined below.

Regulatory Affairs Committee
The Committee continues to focus on the developments with European regulations, including NSFR. Please see the Regulation Update on page 23 for further details.

The Toronto-Dominion Bank was recently approved to participate in the LBMA Gold Price auction process, which is administered by ICE Benchmark Administration (IBA), taking the total number of price participants to eleven. Under new licencing arrangements introduced by IBA, the LBMA Gold Price will be displayed on the LBMA's website with a 30-minute delay with effect from the 1 October, 2015.

Physical Committee
Since the report in the last edition of the *Alchemist* there are currently two active applications – one for gold, which is currently well into stage two, and one for silver, which is currently also in stage two.

The latest round of Pro Active Monitoring (Round 28) is almost complete, with no reported issues. The next round (Round 29) has commenced.

Visual Guide II will be launched shortly. The Visual Guide is designed to assist GDL refiners and vault operators in London to ensure consistency when questions of quality arise and to maintain the smooth movement of physical gold through the London market.

A forum for refiners has been established and the inaugural meeting will be taking place at the Vienna Conference. The objective of the Forum is to provide an opportunity for refiners to discuss issues of mutual interest.

All silver Certified Reference Materials (CRMs) have now been sold. A decision will be made in due course as to whether more silver CRMs will be manufactured. There are still a number of gold CRMs available for purchase. Please contact gdl@lbma.org.uk for further information.

Following the joint meeting between the LBMA and the Shanghai Gold Exchange (SGE), and the recent LBMA Forum held in Shanghai, the 9999 gold kilobar specification was issued (see article on page 21 for further details).

Membership Committee
The Committee continues to review a growing number of Membership applications, which demonstrates the growing relevancy and diversity of the Association. Any refiners, producers or central banks that may be interested in applying for membership are invited to contact Ed Blight at: edward.blight @lbma.org.uk.

Public Affairs Committee
The other main focus for the Committee has been preparing for this year's LBMA/LPPM Conference in Vienna on 18-20 October. Highlights on a fascinating speaker programme include Keynote Speakers Lord Gus O'Donnell, Strategic Advisor to Toronto-Dominion Bank, and John Authers, Senior Investment columnist at *The Financial Times*. In addition, four central banks feature in the Official Sector Session, including the Bank of England, Banque de France, Deutsche Bundesbank and the Oesterreichische Nationalbank. Other sessions to look forward to include Investment, Producer Hedging, a session dedicated to PGMs and an illustrious Panel Session at the end of Day 2. The wrap-up this year will be performed by David Jollie of Mitsui and John Reade from Paulson Europe.

As reported in the last edition of the *Alchemist*, Chris Thompson was appointed to the Management Committee and now replaces Steve Lowe as the MC representative on the PAC. The LBMA would like to take the opportunity to thank Steve for all his hard work and dedication during his time on the Committee. The LBMA also welcomes two new additions to the Committee: Tom Kendall, who was re-appointed following his recent move to ICBC, and Martina Fischer of Hereaus.

For those attending the conference in Vienna, we would encourage you to use the IML handsets to vote to questions which are raised during the sessions. The handsets can also be used to text questions during the sessions and the microphone functionality can be used to ask the speakers and moderators questions direct from the floor during the Q&A at the end of each session. Full instructions can be found in the Conference Brochure.

Finance Committee
The recent focus of the Committee has been in relation to reviewing the budget for recent events such as the Shanghai Forum as well as the Vienna Conference. The Committee is also in the process of reviewing the financial impact of the LBMA's additional services under the strategy review. Looking forward, it will be recommending a three year budget as well as conducting an annual review of Membership fees. The Committee's main aims are to ensure that the LBMA

continues to provide events of the highest quality whilst at the same time staying within budget and thereby delivering value for money for the LBMA Membership.

LBMA Staff Changes

The LBMA is delighted to announce that Edward Blight, formerly of G4S, has been appointed the LBMA's new Operations Director, to replace Sunny Field, who has resigned to take up an opportunity in Singapore. His experience within G4S, as well as substantial time spent working at Amazon and MOD operations, will greatly benefit the LBMA, particularly regarding the work in relation to strategy initiatives. The LBMA is also delighted to report the appointment of Shevaun Fergus, who replaces Jennifer Tan as Executive Assistant to Ruth Crowell and Sakhila Mirza. The LBMA would like to take the opportunity to thank both Sunny and Jennifer for all their hard work during their time at the LBMA and we wish them all the best for the future.

The whole team looks forward to meeting the market and Members at the Vienna Conference. Please refer to the Conference Brochure for the details of the team.

Obituary - Sytze Riedstra

By Frank Heringhaus, Managing Director, Schöne Edelmetaal B.V.

1954 - 2015

Sytze Riedstra, Senior Metal Trader and Sales Manager at Schöne Edelmetaal B.V. in Amsterdam, NL, unfortunately passed away on August 10, 2015 at the age 61, following a recent heart attack.

Sytze had worked at Schöne for almost 40 years and the company meant so much to him. He worked with his heart and soul, and had become part of this company's genes.

His co-workers describe him as funny and also as very authentic, highly reliable and incredibly enthusiastic about his work and the precious metals business.

In the Netherlands – and beyond – he was an institution and a sought-out resource for everyone associated or interested in the precious metals industry. He was consulted by the government, by newspapers and by the tax authorities, to name but a few. His friends, his co-workers and his many business partners often referred to him by his nickname "Dr S. Gold".

As a broker, Sytze possessed extensive knowledge and experience, and had contacts with many European precious metals institutions and businesses. He was Schöne's representative to the LBMA and his passion for the gold business was known to everyone.

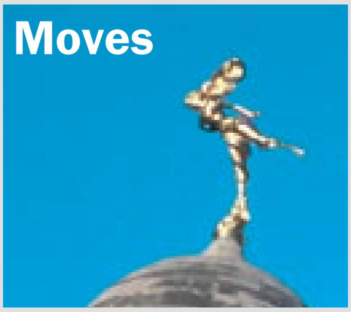
Within the Umicore Group and AGOSI AG, Sytze had been a trusted business partner for many years and his sudden death has touched everyone who had dealings with him in the past.

During the 275th anniversary of Schöne, in November 2014, Sytze was put in the limelight by Humberto Tan, a well-known Dutch radio and TV presenter, in a very entertaining interview that Sytze visibly enjoyed.

Sytze's life dream – as everyone around him knew – was to join the ranks of those who had concluded 40 years of service at Schöne Edelmetaal and to receive the corresponding platinum pin. During the funeral service, this pin was posthumously awarded to him.

He leaves us all with special memories of working and interacting with him. Our thoughts go out to his family.

Market Moves



Miguel Perez-Santalla re-joins Heraeus

Miguel Perez-Santalla has re-joined Heraeus Metals New York as Sales and Marketing Manager, covering the company's clients in the Americas. A thirty year industry veteran Miguel was previously VP of Business Development for BullionVault.

Martyn Whitehead joins Standard Chartered

Martyn Whitehead has recently joined Standard Chartered as Managing Director, Head of Commodities Sales – Europe, Africa and the Americas.

Tom Kendall and Raj Kumar join ICBC Standard Bank Plc

Tom Kendall has joined ICBC Standard Bank Plc in London as Head of Precious Metals Strategy. He moved from LCM Metals UK LLP, an independent brokerage where he was Head of Metals Strategy. Prior to LCM he managed the global commodities research team at Credit Suisse.

Raj Kumar joins ICBC Standard Bank from Deutsche Bank as Managing Director in Precious Metals. He previously held various roles at Deutsche Bank including, Global COO for Commodities, Head of Precious Metals Clearing and Vaulting, Global Head of Precious Metals Sales and Physical Trading. He also represented Deutsche Bank on the LBMA Physical Committee.

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 Telephone: 020 7796 3067 Fax: 020 7283 0030 Email: aelred.connelly@lbma.org.uk www.lbma.org.uk

Editorial Comment

By David Jollie, Head of Research, Mitsui & Co Precious Metals Inc

For the 2015 annual conference, once again held in conjunction with the London Platinum and Palladium Markets (LPPM), the LBMA has plumped for another new location, Vienna in Austria.

So, why does the conference move location each year? Although the LBMA is the London Bullion Market Association, it has member companies located all around the world. This conference is organised by the industry for the industry and we hold a responsibility to involve all of the market, recognising our historical base in London but acknowledging and embracing new developments in our industry. We feel that by moving location on a regular basis we can change the focus of the event and bring it to a new audience at the same time.

Last year's conference was held in Lima, Peru, the first time the conference had taken place in South America. This allowed us to talk to and involve many producers, given the huge number of precious metal mining companies active throughout South America. The geographical distance from the main trading centres made this a smaller, but more concentrated and no less worthwhile event. Sadly, the distance from both the main producing and consuming regions of the platinum group metals meant that the 2014 conference was the first to be held without the direct involvement of the LPPM for some time.

By returning to Europe this year, we have made the event more accessible to the London market in particular and we expect a return to near record attendance. We also welcome back the LPPM as co-sponsor this year, ensuring that this conference will cover each of the four major metals in some depth. In geographical terms, this conference will also follow the historical flow of metal from South America, where the lure of silver and gold attracted the Spanish, to Europe, where this metal was spent, and we can expect a greater focus on the downstream end of the market rather than upstream production.

So, why choose Vienna for this year's event? Vienna is by no means the most active location in the world of precious metals, despite being host to Austria's Central Bank, the Austrian Mint and a number of consumers of our materials and banks.

Vienna does, however, have a very long and important history in the precious metals market. The Maria Theresa Thaler was first minted as a silver coin around the middle of the 18th century in Vienna and subsequently became one of the world's pre-eminent trade coins, aided by the expansion of the Austro-Hungarian Empire. It was minted in numerous locations around the world over the next 200 years and gained acceptance as a real, valuable currency far outside this Empire, underlining the monetary nature that precious metals can possess in the right circumstances. The name of this coin and other older Thalers, after being corrupted, gave rise to the word dollar, just as the UK's currency, sterling, is derived from the name of a different silver coin, again reminding us of the link between the precious metals and the monetary world.

It seems appropriate therefore to be visiting the home of the thaler at a time when the precious metals' monetary value is being raised again. Recent dollar strength and emerging currency weakness have been accompanied by a willingness by the Chinese authorities to allow China's currency, the renminbi, to weaken, reigniting talk of potential 'currency wars'. There are still widespread fears that loose monetary policy around the world and several years of quantitative easing could yet lead to uncontrolled inflation. At the same time, many worry about the possibility that slowing economic growth in China and elsewhere could trigger deflation or stagflation. Meanwhile, precious metal prices have retreated along with those of other commodities, bringing into question whether they can be monetary instruments, financial assets and safe havens from risk, or whether they remain mere commodities.

In this scenario, we therefore plan to start the conference with speeches from Lord Gus O'Donnell, former head of the UK's Civil Service, and John Authers, a well-known FT columnist, who will set the economic and political scene. We will follow this with two sessions focusing on the financial and monetary aspects of the precious metals market, perhaps with an understandable focus on gold.

For much of the lifetime of this conference (which was first held in 2000 in Dubai), the gold price has been rising, contributing to a sense of bullishness and an expanding industry. More recently, the falling gold price has tested the confidence and patience of the gold bulls and encouraged the industry to question the role and reality of this metal. This conference will feature sessions on the official sector and on investment interest on the precious metals, allowing attendees to revisit the question of whether gold retains its value as a currency or as a financial asset.

We will not ignore the commodity aspects of these metals though. The tyranny of the cost curve is well known, with falling prices across the precious metals forcing producers of all of these metals to cut costs and focus on the short and medium-term sustainability of their operations rather than on maximising output in ounces or tonnes. It is therefore a particular pleasure to feature a session on producer hedging, looking at the rationale behind this and some of the ways in which this can be accomplished.

On the final afternoon of the conference, we will also look at some other aspects of the physical gold market as we hold a responsible gold forum, looking at the rules currently covering the sourcing, processing and documenting of gold in an ethical and responsible way. With new rules expected to come into force, this is a key area for the gold market and could be increasingly relevant to the other precious metals too.

Time constraints mean that we can only devote a limited amount of time to some of the more commodity-like aspects of these metals. However, on the second day, we will hear from experts on the Chinese and Indian markets, both of which play a vital role in driving demand for the precious metals. Although the platinum group metals will have their own session, discussions of these metals will also be threaded through some of the other sessions on occasion to test how they are linked to gold and silver, and how these groups of metals might differ. There will be presentations on the jewellery and automotive sectors, the two biggest end uses of these versatile elements.

The final sessions of the conference aim to set the scene for what the next year might hold, with a panel of vastly experienced and hugely informed industry specialists addressing some of the key issues and burning topics facing the industry today. We can expect regulation (which will have its own short session this year on the first day of the conference) and the general move of the precious metals markets from West to East to be two of the key questions that are raised and are likely to be discussed in the bars and coffee houses of Vienna during the conference.

The final act of the conference proper will see myself stepping into Ross Norman's shoes to make my debut in summing up the conference and trying to draw out some of what we have learnt, ably led by John Reade, who has performed the same role valiantly on previous occasions.

With the conference ahead of us, what can we forecast with any certainty? Bearish sentiment seems likely to dominate and sustained low prices could cast a downbeat backdrop for the event. At the time of writing this editorial, we cannot be certain of the Federal Reserve's planned actions in terms of American monetary policy, nor of how soon it might be before the Chinese economy recovers. We can, though, be fairly confident that Viennese patisserie will be inflationary to the waistlines of many of those attending.

facing facts

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

Contingent on approval from the regulators, Anglo Platinum (Amplats) has agreed the sale of its Rustenburg mines, concentrators and tailings retreatment facility – operations that have played a central role in Amplats' dominant producer position over the decades – to Sibanye Gold. Sibanye currently holds the accolade of being South Africa's largest gold producer. Through the proposed acquisition, Sibanye Platinum is now aiming to become South Africa's fourth-largest and the world's fifth-largest producer of mined PGMs. Rustenburg's most recent round of restructuring has been underway since 2013 and its exit from Amplats' portfolio has been on the cards for over a year, with a handful of other non-core assets still on the table. We take a look at the asset and some of the implications of the deal, along with a cursory review of South Africa's broader cost trends for platinum and gold.

Sibanye has, over its three-year history, rightfully built a reputation for extracting value from ageing mining assets. To say that the west Wits gold mines at the centre of its portfolio, which were spun out of Gold Fields, are prolific understates the eminence of these once-powerhouse assets. In terms of historic production volumes, Driefontein is peerless, with over 100 Moz and counting. Perhaps its closest rival is its neighbour, Kloof, also Sibanye's, whose all-time output to date stands at 75 Moz.

Although unable to claim the same prominence in absolute terms for the PGMs space, Amplats' Rustenburg Section has been a leading shaft complex in South Africa's platinum sector for the past two generations. Over the years though, like Driefontein and Kloof, as the Rustenburg shafts' prime reserves have been progressively mined out in several areas, its grade, labour productivity and at times intensive safety initiatives (noted especially in 2007) have pulled output down and pushed unit costs higher.

Having produced 3.9 Moz of platinum in the 2001-2005 period, ten years on, output had almost halved to 2.2 Moz in the period 2011-2015F (see Chart 1). Maintaining annual output above 0.4 Moz, let alone achieve Sibanye's plan to return production to levels of 0.5 Moz or more, will, in our opinion, require a substantial capital commitment, especially following several years of thrifted capital expenditure.

Like many important mines on the Western Limb of the Bushveld, labour strikes were also a factor in 2012 and 2014, while a gradual shift in ore type has commonly seen these mines invest to extract increasing proportions of UG2 ore to replace depleting Merensky ore reserves. Rustenburg has not been alone in experiencing this production trend, as several platinum miners' production and therefore basket pricing have gradually become increasingly exposed to rhodium, whose dollar value has dropped from more than $6,000/oz in 2008 to little more than $1,000/oz over the past two years.

That said, strategically, the transaction appears to make sense for both parties: Amplats has for some time outlined its intention to focus investment on its now flagship open-pit mine, Mogalakwena, as well as pursuing projects that will enable it to produce 80% of its PGMs from less labour-intensive mechanised production sources over the next decade. Although Rustenburg's Bathopele shaft is mechanised, its other two shafts, Siphumelele and Thembelani, which were recently consolidated from four, are likely to remain 'conventional' mines, and from a material flows perspective, output will remain in Amplats' hands for toll refining (generating a margin) and marketing for a minimum of three years.

Chart 1: Rustenburg production (Pt in concentrate)

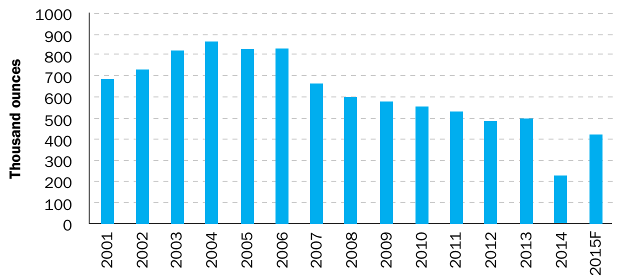
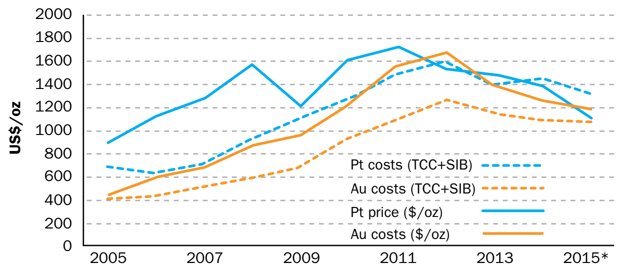


Chart 2: South African production cost vs price: Pt & Au



*2015F costs, 2015 YTD prices

From Sibanye's perspective, this transaction appears to offer a low entry price for a major leveraged player in the platinum sector. The creative way the pricing of the deal was structured gives Sibanye some degree of 'insurance' should prices be slow to improve. The transaction terms comprise an initial R1.5 billion consideration with a deferred 'sliding scale' component expressed as 35% of free cash flows over the first six years of the transaction, subject to a minimum additional payment of R3 billion in nominal terms. Should cash flows in the first three years remain negative, Sibanye will be eligible for a subsidy from Amplats, capped at R267 million per year. That said, in order for this acquisition to pay from Sibanye's perspective, it is apparent that both a turnaround in rand-denominated PGM prices and a lowering of Rustenburg's cost base will be necessary; two elements it appears to believe will occur.

It would be reasonable to assume that Sibanye's new peer group will not be wishing it a near-term turnaround for platinum akin to what it achieved from Gold Fields' mines. An increase back to 'normal' operations on the Western Limb in 2015 after the 2014 strikes, coupled with a continued devaluation in the rand, is likely to help drive a drop in South African platinum producers' dollar-denominated Total Cash Costs (TCC) plus sustaining capital this year. Nevertheless, year-to-date platinum prices are by our analysis some 16% below the South African cost of production (see Chart 2). By way of comparison, though gold producers' margins are stretched thinly, the country's industry average remains positive, with costs by the same measure 8% above the year-to-date spot gold price. In the case of platinum, it is clear that production economics and volumes are not in an efficient equilibrium. Considering current dollar pricing levels, direction and the sombre, even pessimistic tone recently at New York Platinum Week, it still seems that mine rationalisation on a meaningful scale needs to take place before market sentiment has grounds to improve.

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.

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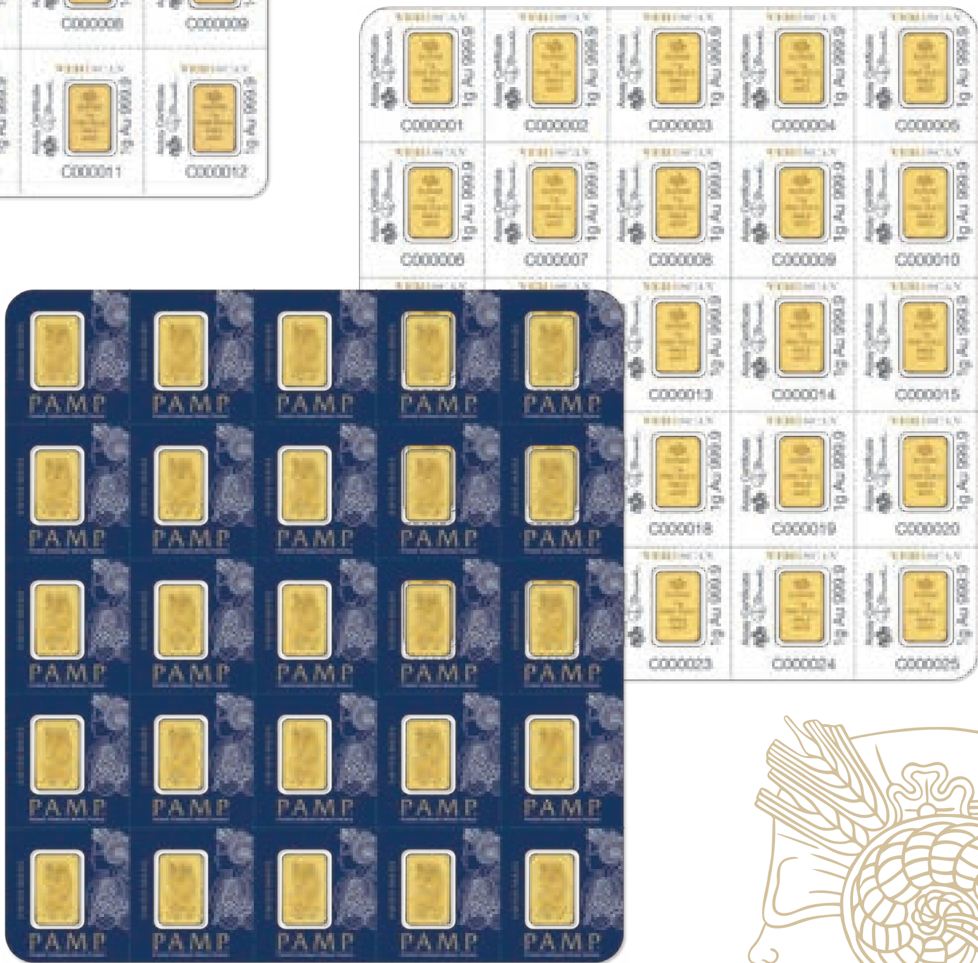

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