THE SILVERINSTITUTE

October 2014

Silver News

An Interview with Ruth Crowell of the LBMA

Ruth Crowell

"Recruitment is the main challenge. The LBMA welcomes all participants in the London Silver Market to sign up and be a direct participant in the auction."

Ruth Crowell is Chief Executive of the London Bullion Market Association (LBMA), a position she has held since January upon the retirement of Stewart Murray, who led the association for 14 years. Previously, she had served as the LBMA's Deputy Chief Executive since June, 2012. She has held other LBMA positions since 2006.

As Chief Executive she is responsible for the success and strategic development of the LBMA, in partnership with the Chairman and the Board. She is also responsible for maintaining accountability to, and the quality of, the Association's Membership and Good Delivery Refiners. She represents the interests of the Association in relation to regulators, investors, media and international precious metals markets.

Following is an edited interview with Crowell.

Silver News: Why was a change in the silver fix needed?

Ms. Crowell: Due to the dwindling number of contributors, the Silver Fixing Company agreed to wind down effective August 15, 2014. This meant that a new daily London spot price mechanism needed to be developed.

SN: What were the features/abilities that allowed CME Group and Thomson Reuters to be selected? Please explain the decision process.

RC: The LBMA was approached by the London Silver Fixing Company and the regulators to facilitate a consultation process to find a new pricing mechanism. Market consensus emerged during the LBMA's market consultation which involved two market surveys, a seminar and numerous meetings with market participants, solution providers and regulators. The second survey indicated a market consensus for the CME Group & Thomson Reuters proposal. The price mechanism also met the LBMA Request for Proposal process criteria that it be electronic, auction-based and auditable. It also had to be tradable and allow an increased number of direct participants. The criteria were based on the feedback provided from market participants who contributed to the first survey. This market consensus was also supported by an independent review conducted by Jonathan Spall of G Cubed Metals Ltd. As part of his review, Jon carried out in-depth interviews with the seven companies who delivered presentations at the seminar on

continued on page 2

continued from page 1

June 20. Feedback from the surveys and the seminar, together with the conclusions of the independent review, were presented directly to a meeting of the LBMA Management Committee, LBMA Market Makers and the Data Working Group.

SN: How will the price be determined with the new procedures compared to the previous system?

RC: The major differences are that there is an independent third-party administrator as well as additional price participants and increased transparency. The information, which is displayed across multiple platforms, shows the live auction rounds, which mirrors what an actual participant sees while taking part.

SN: What are the main benefits to traders and the market?

RC: Automated transparency and the ability to participate directly.

SN: What feedback have you received so far from participants?

RC: So far we have had positive feedback, however there are issues such as credit and foreign exchange hedging which need to be addressed but were not addressed at launch because of time constraints.

SN: What challenges lie ahead?

RC: Recruitment is the main challenge. The LBMA welcomes all participants in the London Silver Market to sign up and be a direct participant in the auction. Also the proposed regulation of the price by HM Treasury recognizes the difference between submission-based benchmarks and transaction based, tradable auction platforms such as the LBMA Silver Price. It also specifically states that participants in such an auction system would not need to be regulated. However, its inclusion on the list of regulated benchmarks has recently deterred potential participants. The LBMA has submitted comments indicating the detrimental affect this regulation will have on broadening participation, particularly to industrial members of the market.

SN: What else would you like people to know?

RC: In terms of responsibilities, the CME Group provides the electronic auction platform on which the price is calculated and Thomson Reuters is responsible for administration and governance of the LBMA Silver price, which was successfully launched on August 15. The LBMA is responsible for accrediting price participants and also owns the intellectual property rights.

The London Silver Fix had been a global benchmark for 117 years. This new process for establishing the LBMA Silver Price will maintain continuity with the earlier silver fixing process for market participants while also increasing transparency via an electronic platform for the auction. It continues to be London-based and offers a fully IOSCO (International Organization Of Securities Commissions) - compliant solution to the London bullion marketplace. The earlier benchmarking process has been followed in order to minimize any possible disruptions and enable a seamless transition for the market.

Silver Helps Camouflage Researchers Mimic Octopi, Squids and Cuttlefish

Camouflage has been a longtime goal of military strategists who have often looked to the animal world for inspiration and guidance because of the ability of particular creatures to change their color rapidly in response to their environment. Now, silver is playing a role in helping to hide materiel from enemies.

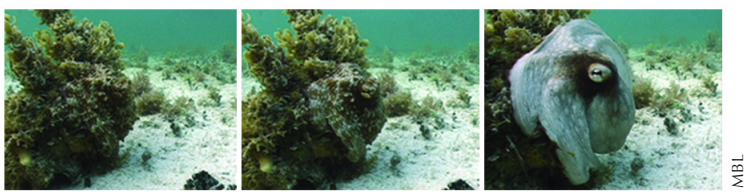
Octopi and other cephalopods such as squids and cuttlefish have a top layer of skin containing organs that some scientists liken to miniscule bags of paint that can expand or contract. When flexed, these webs of tiny muscles allow the creatures to change shape and turn color in less than a second, according to Roger Hanlon, Senior Scientist at the Marine Biological Laboratory in Woods Hole, Massachusetts. Working with John Rogers, a materials scientist at the University of Illinois at Urbana Champaign, Hanlon hopes to mimic the cephalopod's capability to change patterns quickly by changing the structure and color of their skins.

"A distinguishing feature of cephalopods is that individual animals can change their appearance with a speed and diversity unparalleled in the animal kingdom," Hanlon recently wrote. "We term this 'rapid, neurally controlled polymorphism.' Some squids, octopi and cuttlefish can show 30-50 different appearances. In fact, these marine invertebrates manifest most aspects of their behavior through body patterning." Unlike some other camouflaging animals, Hanlon noted, cephalopods use many different techniques to hide themselves from prey including background matching, countershading and disruptive coloration.

Using cephalopods as their models, Hanlon, Rogers and their team have produced basic pieces of synthetic cephalopod skin which, when viewed close up, look like tiny black squares, each about the size of a grain of salt. The pieces are in grids with each square painted with a dye that changes from black to white and back again with the introduction of heat from tiny heating elements. Underneath each dye layer is a film of silver particles that reflect light entering the skin through the dye.

The researchers have discovered that when they shine light on the squares in the shape of letters, the all-black squares will mimic the letters in white. Rogers points out that this is still in the early stages of development and it will be several years – if ever – before they can mimic the complicated way in which cephalopods camouflage themselves.

Military applications will be developed first, according to Rogers, who notes that the U.S. Navy is financially supporting his work.



MBL

This octopus turns from fully camouflaged to fully visible.

Perth Mint Offers 5-Ounce Silver Proof Coin Depicting Chinese Mythical Creatures

American Eagle Silver Bullion Coins September Sales Surge, U.S. Mint Reports

The Perth Mint has produced a 5-ounce, limited edition 99.9% pure silver proof coin that illustrates in vibrant colors four ancient Chinese mythical creatures. The creatures are guarding four heavenly quadrants, marking the beginning and end of the winter and summer solstices and the autumn and spring equinoxes. Guarding these four celestial palaces are the white tiger, blue dragon, black tortoise and red phoenix. At the center is a Yin Yang symbol gilded in 24 carat gold.

Chinese Ancient Mythical Creatures 2014 5-oz Silver Proof Colored Coin

The 2014 coin, of which only 1,000 will be minted, is legal tender in Tuvalu, a Polynesian island nation located in the Pacific Ocean, midway between Hawaii and Australia. The five dollar coin depicts Queen Elizabeth II on the obverse.

Each *Chinese Ancient Mythical Creatures 2014* 5-oz Silver Proof Colored Coin costs AUS450 and comes in a black box with a certificate of authenticity.

In the United States, sales of American Eagle Silver Bullion Coins reached 4,140,000 units in September, surging 106.2 percent over August sales of 2,007,500 coins, according to the U.S. Mint.

Year-to-date sales were 32,251,000, slightly behind last year's record year, when sales from the January-September period reached 36,088,000 coins. However, sales this year are higher than sales in all but four of the years since the coin's introduction in 1986.

A Silver Nanoparticle Problem that Nobody Knew About is Solved

It turns out that silver nanoparticles are not as solid as initially thought, making their use in electronic components and circuits a bit challenging as gadgets become increasingly smaller. Fortunately, there is a solution.

Because of its superb electrical conductivity and high melting temperature, silver is used in many aspects of electronic design. Recently, however, scientists have discovered that as the particles become microscopically smaller – in the 10 nanometer range – their outside layer mimics water droplets, wobbling and changing shape, while the inside stays stable. This can be problematic for their use in electrical contacts at the molecular level (10 nanometers is one-thousandth of the width of a human hair) as the silver could leak and cause short circuits. This could be especially challenging in devices that move around a lot or rely on movement like tiny motors or sensors in mobile applications.

A research team at MIT first noticed this phenomenon while studying silver nanoparticles but they believe it will apply to other metal nanoparticles as well.

MIT professor Ju Li notes that the use of nanoparticles in applications ranging from electronics to pharmaceuticals is a crucial area of research at the moment: "These researchers want to form shapes, and they want these shapes to be stable, in many cases over a period of years. If gold or silver nanoparticles are used in electronic circuits, these deformations could quickly cause electrical connections to fail."

Once Li and his team began delving into this behavior, they saw that only the top layers – one or two atoms thick – actually moved. As they moved, they deposited themselves elsewhere on the surface. However, the inside atoms remained solid and in perfect shape.

Scientists had theorized that this surface movement was happening but this is the first time it has been confirmed. Now that this movement has been observed and understood, the solution to allowing nanoparticles to retain their shapes turns out to be rather simple. When a thin layer of oxide is applied, the liquid-like movement is almost completely eliminated and the nanoparticle remains stable, ensuring that silver will remain a solid choice for nanotechnology applications.

Silver-Coated Filter Keeps Air Germ Free

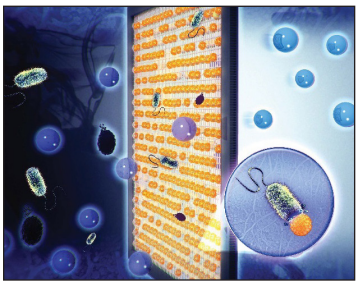
A new air filter system coated with silver nanoparticles can keep filters free of germs that could otherwise enter buildings and cars and harm those inside, according to a Korean research team.

Air filters, like those used in building and car air conditioners, stop pollutants but can also become a source of bacteria that become trapped within the filter. These bacteria are almost impossible to remove except by spraying the filter with an antibacterial chemical, which itself could cause toxic fumes to enter the air-conditioned area.

A team of researchers from Korea Institute of Science and Technology, led by Dr. Woo Kyoung-ja, in collaboration with a Yonsei University mechanical engineering team led by Professor Hwang Jung-ho, have produced the germ-fighting filter system by taking nanoparticles of silver about 1-2 nanometers long and growing them to 30 nanometers. Then they coat the air filters with the silver particles.

The team tested the efficacy of the filtration system on E. coli and Staphylococcus epidermidis and found that the silver eliminated the bacteria on contact.

The results appeared in the September 17 edition of the *Journal of Materials Chemistry*, published by the Royal Society of Chemistry.



MINISTRY OF SCIENCE, ICT AND FUTURE PLANNING

An air filter system coated with silver nanoparticles (yellow) eradicates bacteria upon contact, supplying clean air (right).

Barrick to Supply Metals for Medals at the TORONTO 2015 Pan Am/Parapan Am Games

Barrick Gold Corporation is the Official Metal Supplier of the TORONTO 2015 Pan Am/Parapan Am Games, also known as TO2015. The company will supply all the raw materials to produce more than 4,000 gold, silver and bronze medals to be awarded at the Games.

The Royal Canadian Mint is designing and producing the medals in collaboration with TO2015. Barrick officials have not yet announced which mines will supply the metals but have said they will come from mines throughout the Americas.

“Barrick is a proud Canadian company with operations around the globe, including six Pan American countries,” said Barrick Co-President Kelvin Dushnisky. “With the 2015 Pan Am and Parapan Games being held in our hometown of Toronto, we saw a rare opportunity to do something that symbolizes our pride in our heritage and our commitment to our host countries. We look forward to welcoming the athletes and government representatives to Toronto next summer.”

The Games are expected to attract about 380 million viewers in the Americas alone, company officials noted. “Barrick is one of Canada’s most well-known and successful global companies with deep roots working in the Pan American region,” said Saäd Rafi, Chief Executive Officer of the TORONTO 2015 Pan Am/Parapan Am Games Organizing Committee. “We’re pleased to welcome them on board as our Official Metal Supplier.”

Barrick, a member of the Silver Institute, has 14 operations in six Pan American countries, including Argentina, Canada, Chile, Dominican Republic, Peru and the United States.

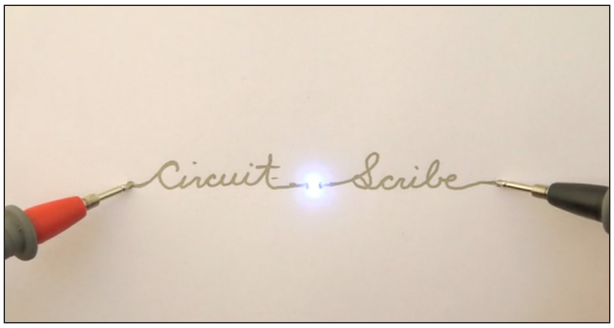
The TORONTO 2015 Games are funded by the Government of Canada and the Province of Ontario, as well as Lead Partner CIBC and other partners and sponsors. The Pan American Games are scheduled for July 10-26 and the Parapan American Games August 7-15.

Rollerball Pen with Silver Ink Helps People Learn About Electronics

A pen that writes with silver ink, able to produce lines that conduct electricity, raised $674,425 for its developers through crowd funding and is now available for sale as the centerpiece of experiment kits that help people learn about electronics.

The Circuit Scribe pen allows experimenters and students to produce circuitry without using traditional breadboards that require connecting wires and clips that hold components. The pen, experimental at the time, was featured in the August, 2011 edition of *Silver News*.

The basic *Lite Kit*, ($25) for example, includes one conductive Ink Pen, one LED module, and two coin-cell batteries that allow users to place magnetic component modules on a metal surface and make silver ink sketches between them with the pen to power the LED light. The advanced *Developer Kit* ($195) contains batteries, sensors, transistors, LED modules and other components. Other kits are available and all contain a manual of experiments. The pens alone are for sale at $100 for a 5-pack.



CIRCUIT SCRIBE

Click the image to watch the silver ink pen in action.

Ralph Lauren Shows Off Silver-Laced Shirts That Transmit Biometrics During Sports

As more professional and amateur athletes are measuring their heartbeat, perspiration, respiration and other functions during physical activities, silver imbedded in workout clothes is helping to transmit data to smartphones and other devices.

For example, ball boys and girls working at the 2014 U.S. Open Tennis Championships in New York City wore the Polo Tech Shirt, introduced by Ralph Lauren. The shirts have bio-sensing silver fibers woven directly into the core fabric of the nylon shirt. Silver's high electrical conductivity and resistance to rust from body moisture make it ideal to transmit data about the wearer's heart rate, stress level, distance and breathing in real time. The Polo Tech Shirt is a forerunner of a line of athletic shirts and tech-enhanced dress shirts that Ralph Lauren officials said will be available next year.

Because of silver's ability to stave off odor-causing bacteria, wearers get additional protection against odor caused by perspiration.

Ralph Lauren designed and produced the high-styled Polo Tech Shirt, sporting the designer's polo pony brand symbol on the front, in collaboration with OMSignals, a Canadian company pioneering the development, production and marketing of biometric sportswear.

For more information visit the Silver Institute website.

RALPH LAUREN

This shirt from Ralph Lauren uses silver fibers to transmit biometric data to smartphones and other devices.

Men's Briefs With Silver Offer Protection from Mobile Phone Radiation

Silver offers excellent shielding from radio waves and even has been used in wallpaper to prevent eavesdropping on cell phones and wi-fi signals (see *Stealth Wallpaper Uses Silver to Block Wi-Fi Signals,* June, 2012, *Silver News*). Now, a company has added silver-laced fabrics to men's boxer briefs to keep phone signals – from mobiles kept in pants pockets – from reaching reproductive organs, a situation they claim can harm sperm.

Based on independent laboratory testing results presented to the Federal Communications Commission, the silver in the underwear's codpiece and back from Radiashield Technologies reduces 99.9 percent of electromagnetic radiation in a wide range of frequencies including those of mobile phones.

Although the New York City-based company cites studies showing that cell phone radiation can decrease sperm, other studies have shown no effect.

The briefs, which retail for $49, are made of Modal/Spandex and are anti-bacterial and anti-odor, according to company officials. The briefs are the newest addition to the company's silver-based, anti-radiation product line that includes the *Belly Band* for pregnant women, maternity tops, baby blankets and nursing covers.

Larry Kahaner
Editor

www.silverinstitute.org
@SilverInstitute on Twitter

THE SILVERINSTITUTE
1400 Eye Street, NW, Suite 550
Washington, DC 20005
T 202.835 0185
F 202.835 0155