YALE MINERAL AND GEM SYMPOSIUM IN DAVID FRIEND HALL

2018 Yale Mineral and Gem Symposium in David Friend Hall
Saturday, October 20, 2018
David Friend Hall, Yale Peabody Museum of Natural History

Keynote Speaker
Dr. Jack Ogden, Fellow of the Society of Antiquaries of London and of the Gemmological Association of Great Britain

General theme of the Yale Mineral and Gem Symposium: The Cultural and Scientific Value of Mineral Beauty

2018 Agenda:

Friday, October 19, 2018
5:00 – 6:00pm Jack Ogden; Striptwist Ltd., UK
The Early History of Diamonds; followed by book signing
6:00 – 7:30 Evening Reception

Saturday, October 20, 2018
Symposium
8:15 – 8:45am Continental Breakfast
Hall of Minerals, Earth and Space
Peabody Museum

Morning Session
8:45 – 9:30 David Friend; CEO, Wasabi, Inc.
Natural History Museums that Inspire

9:30 – 10:15 Alyson M. Thibodeau; Assistant Professor of Earth Sciences, Dickinson College
Was there a Turquoise Trail? Rethinking Ancient Turquoise Mining and Exchange in the Southwestern United States and Mexico

10:15 – 10:30 Break

10:30 – 11:15 C.R. "Cap" Beesley; President ARD Analytics, Inc. and Chairman of Gemcore's Gemstone Standards Commission
"Collecting the Classics™" Part III: Emeralds from Ancient Egypt to the Gemstone Classics of Colombia

11:15 – 12:00pm Christopher "Mike" Breeding; Gemological Institute of America
Colored Diamonds: The Beauty and Value of Imperfection

12:00 – 1:30 Lunch (provided)

Afternoon Session
1:30 – 2:15 Anikó Bezur; Director of the Yale IPCH Technical Studies Laboratory
The Enemy Within - Discovering the Presence of a Rare Mineral and Exploring Its Harmful Genesis in a Renaissance Polychrome Terracotta Relief

2:15 – 3:00 Walter "Les" Presmyk; Vice Chairman, Flagg Mineral Foundation; Vice President, Tucson Gem and Mineral Society
Arizona and Its Historic Love Affair with Minerals

3:00 – 3:15 Break

3:15 – 4:00 Peter K. M. Megaw; President, IMDEX/Cascabel; co-founder, MAG Silver and Minaurum Gold
Electric Opal: Unique Daylight Luminescing Hyalite Opal from Mexico

4:00 – 4:45 Jack Ogden; Striptwist Ltd., UK
Silurian and Devonian: How Minerals Drifted into Myth and Back - keynote presentation
The Early History of Diamonds

Dr. Jack Ogden
Striptwist Ltd., UK

Two thousand years ago, in Roman times, diamonds were already considered the most valuable of gems. They were rare, coming to Europe from India, and far too hard to cut or polish. It was this rarity and invincibility that gave them allure. Following the collapse of the Roman Empire, it was many centuries before diamonds began to reach Europe again, and then their invincibility waned as the techniques to cut and polish them were developed. This presentation will trace the early history of diamonds through rare surviving examples and the legends surrounding them, ending with the Renaissance Period when cutting and polishing were fully established and diamonds exhibited the bright sparkle we associated with them today.

Natural History Museums that Inspire

David Friend
CEO, Wasabi, Inc.

The Yale Peabody Museum was founded in 1866. This was an era of great explorers -- naturalists, botanists, geologists, zoologists, and paleontologists -- who roamed distant continents and returned with boatloads of specimens of birds, animals, bugs, fossils, rocks, minerals, and more. They needed someplace to store it all. Enter the natural history museums.

Natural history museums became a great resource for attracting top scientists and students. They distinguished great universities like Yale and Harvard by providing a rich source of materials for study and analysis. Like today's "big science" facilities, such as telescopes, particle colliders, and supercomputers, natural history museums became the face of universities to the scientific community, and to the public.

Today, natural history museums have two distinct missions: the "upstairs" mission is to educate the public and inspire future generations of amateur and professional scientists. The "downstairs" mission supports scientific research. As museums come to grips with this growing "upstairs-downstairs" dichotomy, their facilities and collections have to change. We're seeing that happen right here and right now at Yale.

Was there a Turquoise Trail? Rethinking Ancient Turquoise Mining and Exchange in the Southwestern United States and Mexico

Dr. Alyson M. Thibodeau
Assistant Professor of Earth Sciences, Dickinson College

Turquoise is the blue-green mineral that was highly valued and broadly used by prehispanic societies that lived in what is today the American Southwest and Mexico. In the American Southwest, traces of prehispanic turquoise mines are present across Arizona, New Mexico, Colorado, Nevada, and California. However, archaeological evidence for the use of turquoise extends over a broader area, stretching through Mexico to parts of Central America. How can we trace the geologic origins of turquoise artifacts? Was turquoise exchanged or moved over long distances? This talk will address the current state of our knowledge on the use, mining, and exchange of the mineral by prehispanic groups in North America. In particular, I will discuss recent research on the source of Aztec and Mixtec turquoise artifacts that overturns traditional ideas about the long-distance movement of the mineral and provides a new perspective on the availability of turquoise outside of the American Southwest.

"Collecting the Classics™" Part III: Emeralds from Ancient Egypt to the Gemstone Classics of Colombia

C.R. "Cap" Beesley
President ARD Analytics, Inc. and Chairman of Gemcore's Gemstone Standards Commission

This year Cap will present Part III of the Precious Gemstone Trilogy, "Collecting the Classics™". Part I of the series concentrated on the sapphires of Kashmir and was presented at the 150th year celebration of the Yale Peabody Museum and the Grand Opening of the spectacular David Friend Hall of Gems and Minerals. Part II, focused on the origin, enhancement and quality assessment of classic rubies from the Mogok region of Burma (Myanmar).

The 2018 presentation has been expanded to include a comprehensive analysis of the global, geological and historical aspects of emerald collecting from ancient Egypt to the gemstone classics of Colombia and emeralds from the Hiddenite hills of North Carolina. Included in this session will be an...
analysis of the challenges of determining country of origin, enhancement/treatment detection, quality assessment and the impact of these important issues on the market value of emeralds.

Colored Diamonds: The Beauty and Value of Imperfection

Dr. Christopher "Mike" Breeding
Gemological Institute of America

Diamonds usually invoke thoughts of large crystal-clear and flawless stones that sparkle in the sunlight. These magnificent gems are associated with love or social status and are prized for their beauty and purity, not to mention their immense value. Unbeknownst to most, however, is that the occurrence of certain imperfections, or lattice defects, in diamond can produce colors that are much rarer and more valuable than any colorless stone. In 2015, a single 12 carat blue diamond sold for more than US $48 million.

Imperfections in diamond, at the atomic level, can produce all the colors of the rainbow. Some defects consist of impurities like nitrogen or boron incorporated during growth and others result from misaligned or missing atoms caused by post-growth deformation or exposure to radiation. For a mineral ideally composed entirely of carbon, diamond is an extremely complex gem in which imperfection is not necessarily detrimental.

The Enemy Within – Discovering the Presence of a Rare Mineral and Exploring Its Harmful Genesis in a Renaissance Polychrome Terracotta Relief

Dr. Anikó Bezur
Wallace S. Wilson Director of the Yale IPCH Technical Studies Laboratory

Salts top the list of "usual suspects" when art and architectural conservators encounter flaking paint on a porous surface such as limestone, brick, or terracotta. Therefore, it was not surprising to find salt crystals growing within and between paint layers on a fifteenth-century gilt and polychromed terracotta relief, Virgin and Child by Michele da Firenze, undergoing examination and conservation treatment in the collection of the Yale University Art Gallery. Learning that the culprit was challacolloite, a mineral first named in 2005, was intriguing along with the fact that this compound had been documented in fumaroles of volcanos, including those in Italy. This talk details our unusual discovery, the likely genesis of challacolloite within paint layers, and the consequences of this on the treatment and future stability of this beautiful object.

Arizona and Its Historic Love Affair with Minerals

Walter Lesley "Les" Presmyk
Vice Chairman, Flagg Mineral Foundation; Vice President, Tucson Gem and Mineral Society

While the indigenous tribes in Arizona did not develop the metal working skills of the Inca and Maya civilizations, the use and importance of turquoise and other minerals is evident for centuries before the first European set foot in this area. Arizona's history is driven by the exploration for gold and silver by the Spanish starting in the 1500s and continuing through 1848 when the northern portion became United States territory and the acquisition of the southern portion of Arizona in 1853 with the Gadsden Purchase.

Since that time and until statehood was granted in 1912, minerals and mineral specimens have played a significant role with the early explorers and settlers, along with the mining companies helping to promote statehood. This culminated in the Phelps-Dodge display of fabulous azurite, malachite and calcite specimens at the 1893 Columbian Exposition and then the World's Fair in St. Louis in 1904.

Electric Opal: Unique Daylight Luminescing Hyalite Opal from Mexico

Dr. Peter K. M. Megaw
President, IMDEX/Cascabel; co-founder, MAG Silver and Minaurum Gold

Electric Opal™ – Daylight luminescing hyalite opal shows a uniquely beautiful and pronounced color-change phenomenon from near-colorless or pale-yellow in incandescent light; to bright chartreuse green in indirect sunlight. It occurs as free-standing lustrous transparent botryoids that make very attractive specimens, which are also facetable into extraordinary gemstones. It was hand-mined from 2013 to 2015 when the deposit was exhausted.

Electric Opal™ captured the immediate attention of the mineral and gemstone world and led to a multinational/multi-disciplinary research effort to characterize the material. They are Opal-AN (aka hyalite) the amorphous (A), glass-like opal variety consisting of network-forming (N) hydrated silica molecules. Opal-AN is always 'common' opal as it does not have a regular array of spheres or microstructure to give it play-of-color. The daylight-induced green luminescence stems from trace amounts of the uranyl molecule (UO2)2+, but the radioactivity of the opal is well within background levels and it is safe to wear.

Science and Delusion: How Minerals Drifted into Myth and Back

Dr. Jack Ogden
Striptwist Ltd., UK

The attractive minerals we think of as gems today have been cherished by people from very early times, but as scientists we usually dismiss the myths and powers that have been associated with
them as manifestations of ignorance and superstition. A more careful look, however, reveals that there can be a rational origin for some of these beliefs, but they have been misinterpreted by us, or by the medieval scribes who copied the earlier texts. Scrape away the veneer of supposed magical properties of minerals and sometimes we can gain insights into the history of science and medicine.

< Event information
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**Eyewitness Speaker:** Dr. Jack Ogden

**Stripwist Ltd U**

**The Early History of Diamonds**

"Science and Delusion: How Minerals Drifted into Myth and Back"

Dr. Jack Ogden is a British historian whose academic research over some years has focused on the historical use, technology, and trading of gems and other jewellery materials. He has written several books and numerous articles on these subjects and lectured worldwide. Most recently, he has published "Diamonds: An Early History of the King of Gems." In addition to research and consultancy work, his career has included being Chief Executive of the Gemological Association of Great Britain Gem A from 1998 to 2010. He has been awarded a Doctorate from Durham University and the Gem A Gemmology Diploma with distinction. He is a fellow of the Society of Antiquaries of London and president of the Society of Jewellery Historians. He lives in Oxfordshire.

**David Riend**

CEO, Wasabi Inc

**Natural History Museums that Inspire**

David Riend has been collecting minerals since the age of 12. Son of a chemical engineer, he grew up studying crystals in his basement laboratory and discovering them in rock formations near his home outside New York City. Wherever he travelled with his parents, museums with mineral collections were always on the itinerary.

Mr. Riend has a BS from Yale and was a David Sarnoff Fellow at the Princeton University Graduate School of Engineering. He co-founded his first company in 1992 and has founded technology companies over the years, including Carbonite—a NASDAQ-listed company in the computer backup and disaster recovery market. Many more companies, including Wasabi—a company that provides fast, very inexpensive data storage in the cloud—have been on numerous boards of both for-profit and non-profit institutions, including the New England Conservatory, Berklee College of Music, and the Brookings Institution. He is chairman of the board of Boston Baroque, a Grammy-nominated orchestra and chorus. His gifts to Yale include the construction of the David Riend Hall at the Yale Peabody Museum of Natural History.

**Dr. Alyson M. Thibodeau**

Assistant Professor of Earth Sciences, Dickinson College

**Was there a Turquoise Trail? Rethinking Ancient Turquoise Mining and Exchange in the Southwestern United States and Mexico**

Dr. Thibodeau is an Assistant Professor of Earth Sciences at Dickinson College in Carlisle, Pennsylvania. She holds an M.S. and a Ph.D. in Geosciences from the University of Arizona and a B.A. in Geology and Anthropology from Amherst College. As a graduate student, she held an NSF-IGERT fellowship in Archaeological Science. An experience that led her to pursue research that applies geochemistry to archaeological questions and problems. She specializes in using isotopic techniques to trace the sources of artifacts, especially those made of turquoise, and is especially active in research pertaining to the American Southwest and Mexico. Among other institutions she has collaborated with the National Museum of the American Indian, the American Museum of Natural History, the Arizona State Museum, and the Museo del Templo Mayor. Her work has been covered by a variety of outlets, including The New York Times, Archaeology Magazine, and Earth Magazine.

**CR Cap Beesley**

President, ARD Analytics Inc and Chairman of Gemcore's Gemstone Standards Commission

"Collecting the Classics™" Part III: Emeralds from Ancient Egypt to the Gemstone Classics of Colombia
C. R. Cap Beesley is an internationally known consultant and gem sciences specialist and is president of Analytics Research and Development, a firm focused on consulting in gem and mineral related fields and is chairman of the Gemstone Standards Commission at Gemcore, a non-profit educational organization dedicated to developing consumer protection programs for gemstone buyers and collectors.

Beesley was founder and president of American Gemological Laboratories, a New York based international gem testing facility specializing in the determination of country of origin gem enhancement detection and quality assessment of ruby, emerald, and sapphire. He also served as the primary gem consultant to the United Nations Minerals Branch for more than 15 years, establishing gem laboratories and training facilities and teaching at the University of Peshawar in Pakistan, the University of Ashmira in Azad, and at the Geological Survey of Malawi.

Previously, as a senior staff member of the Gemological Institute of America, he was responsible for implementing GIA's six-month resident program on the East Coast, developing the model for its first colored stone grading course, and directing GIA's gem investment program.

Beesley serves on Yale University's Leadership Council for the Peabody Museum of Natural History and as chairman of the Museum's Mineral and Gem Advisory Board. He is also a Research Associate in the Department of Geosciences at the University of Arizona and since 2006, a member of the University's Gem and Mineral Museum Project Advisory Board.

Dr. Aniky Bezur, Wallace S. Wilson Director of the IPCH Technical Studies Laboratory at Yale Institute for the Preservation of Cultural Heritage, is a research scientist for the Museum of Fine Arts, Houston, and a GIA Graduate Gemologist.

Over the last 15 years at GIA, Mike has worked on every type of gemstone ranging from quartz to diamond. He also manages GIA's postdoctoral associates and interns in the Carlsbad research group. His current research is concerned primarily with origin of color and configuration of lattice defects in colored and colorless diamonds and identification of treatments and synthetics. He regularly works to develop new instruments for the diamond trade and gives seminars worldwide to educate the industry about diamond defects and non-destructive spectroscopic analysis of gemstones.

Dr. Christoper Mike Breeding is a senior research scientist and manager of diamond analytical testing at the Gemological Institute of America in Carlsbad, California. He obtained a B.S. in geology from the College of William and Mary in Virginia, a Ph.D. in geology from Yale University and is a GIA Graduate Gemologist.

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Dr. Bezur's research interests include the study of ancient and historic technologies involved in the creation of material culture, the alteration of ob ects through use and degradation, and the adaptation and improvement of analytical techniques in this research. Dr. Bezur's recent projects include the study of the Yale University Art Gallery's Education of the Virgin attributed to painter Diego Velázquez, and the exploration of a rare stained glass window by Bohumír Mudařík and the discovery and documentation of a rare salt on Virgin and Child terracotta relief by Michele da Brenze. She has also published research on still-life paintings by Pablo Picasso, European porcelain use of x-ray fluorescence spectroscopy in the study of porcelain objects as well as other sub-objects. Dr. Bezur worked with the Sicilian Archaeological Pro eect in Peru for over a decade, studying the copper metallurgy of the Middle Sicilian period CE and assisting with materials characterization and conservation needs of the excavated materials.
Society
Arizona and Its Historic Love Affair with Minerals

Les Presmyk recently retired as Principal Mining Engineer for SRP overseeing coal contracts and coal mines in Arizona, New Mexico and Colorado and serving as Chairman of the Board of the Trapper Mine in Craig, Colorado for five years. He and his wife of 50 years, Paula, are Arizona natives and are both graduates of the University of Arizona.

Les started collecting at the age of seven and most attended his 50th straight Tucson Show. Their displays have received A.M.S. Regional and National Trophies, along with the Prospectors and Pearl Trophies in Denver and the Desautels, Lidstrom and Bideaux Trophies at the Tucson Show. Les is the recipient of the Carnegie Mineralogical Award.

He is the current Vice President of the Tucson Gem and Mineral Society and current Vice Chairman of the Flag Mineral Foundation. He is a past President of the Mineralogical Society of Arizona, Board Member and Chairman of the Arizona Mineral and Mining Museum, and now the Flag Mineral Foundation. Les is a founding member of the University of Arizona Mineral Museum Advisory Board recently appointed to the advisory Board of the new Arizona Mining, Mineral and Natural Resource Museum and a member of the Tucson Show Committee for 20 years.

He has explored and collected in a number of localities in Arizona, Missouri and Mexico, and provided engineering expertise at the San Francisco mine in Sonora, Mexico; the Brushy Creek mine in Missouri; and the Red Cloud mine in Arizona. Les has written several articles and co-authored the recently published “Collecting Arizona.” He has spoken at the Dallas Symposium and the Northwest niels of Mineralogy Symposium along with the Arizona and New Mexico Symposia, the Tucson Springfield and Denver Shows, and numerous mineral clubs throughout the United States.

His community activities include being a former councilmember and vice mayor of Gilbert, Arizona. He is currently serving as Chairman of the Parks and Recreation Advisory Board, Vice Chairman of the Dignity Foundation Board, President of The Leadership Centre, member of the Gilbert Veterans Day Committee, and has been appointed to the four-year General Plan Update Committee.

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2018 YALE MINERAL AND GEM SYMPOSIUM - SPEAKER BIOS

< Event information

Keynote Speaker: Dr. Jack Ogden
Site: Stowlett Ltd., UK
Title: The Early History of Diamonds

Science and Delusion: How Minerals Drifted into Myth and Back

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David Friend
CEO, Wasabi, Inc.
Title: Natural History Museums that Inspire

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