



Thirty-Second Annual
American Mining Hall of Fame



**Awards
Presentation**
BANQUET & FUNDRAISER

Saturday, December 6th, 2014
JW Marriott Starr Pass Resort & Spa, Tucson, Arizona

Program

6:15 p.m. RECEPTION
 7:00 p.m. BANQUET
 8:00 p.m. CEREMONY

-
- Welcoming Remarks: **MARK BAKER**, PRESIDENT, MFSW
- Introduction of Head Table
and Other Honored Guests: **MARK BAKER**
- Outreach Education Program: **PAMELA A.K. WILKINSON**
U OF A - LOWELL INSTITUTE FOR MINERAL RESOURCES
- Introduction of Inductees: **A. JOHN BRODERICK**, VICE PRESIDENT, MFSW
- Presentation of Inductees
From Mining's Past **PATRICK E. CONNOR**
(1820-1892)
BY A. JOHN BRODERICK:
- EARL T. STANNARD**
(1882-1949)
- ARTHUR B. PARSONS** (1887-1966)
ACCEPTED BY PAUL S. HARTER
- ERNEST R. DICKIE** (1902-1955)
ACCEPTED BY HIS SON, LARRY R. DICKIE
- Presentation of Medals of Merit **CORALE L. AND JAMES A. BRIERLEY**
BY A. JOHN BRODERICK: **DAVID E. NICHOLAS**
- Presentation of Medal of Merit **SCOTT M. SHIELDS**
Under age 40 BY A. JOHN BRODERICK:
- Presentation of Industry Partnership **EMPIRE SOUTHWEST**
BY A. JOHN BRODERICK: ACCEPTED BY JEFF WHITEMAN, PRESIDENT & CEO
- Presentation of Special Recognition **EMPLOYEES OF RIO TINTO KENNECOTT**
BY MARK BAKER: **BINGHAM CANYON MINE**
ACCEPTED BY MATTHEW LENGERICH, GENERAL MGR., MINING
- Grand Door Prize: **MARK BAKER**
SELECTED BY EILEEN FITZMAURICE
- Presentation of Inductee **ARMINE FREDERICK BANFIELD, JR.**
BY MARK BAKER:
- Featured Address: **ARMINE FREDERICK BANFIELD, JR.**
- Adjournment: **MARK BAKER**



PLATINUM

ASARCO LLC

Freeport-McMoRan Copper & Gold Inc.

Independent Mining Consultants, Inc.

Joy Global

Komatsu America Corp.

M3 Engineering & Technology Corporation

MineSight

GOLD

Ames Construction, Inc.

Atlas Copco

Caterpillar Inc.

Florence Copper

Keane Mineral Engineering LLC

Modular Mining Systems, Inc.

Newmont Mining Corporation

Southwest Energy LLC

SILVER

Brierley Consultancy LLC

CALL & NICHOLAS, INC.

Click Automotive Team

DeConcini McDonald Yetwin & Lacy, P.C.

Empire Southwest

Hudbay Minerals Inc.

Layne Christensen

Liebherr Mining Equipment, Inc.

Lowell Copper Ltd.

Montgomery & Associates

Motion Metrics International Corp.

MWH Global

RAM Enterprise, Inc.

RDE Evaluations

Rio Tinto Kennecott

Sonoran Process Equipment Co.

SRK Consulting

Tetra Tech

Mining Foundation of the Southwest

The Mining Foundation of the Southwest (MFSW) was incorporated in 1982 by combining the Mining Club of the Southwest and the Mining Club of the Southwest Foundation. The purpose of the Foundation is to promote the value of the mining industry, honor its past and ensure its future.

Funds generated through membership and the annual banquet are earmarked to support our mission to enlighten the public about the vital importance of the mining industry. MFSW, working in conjunction with the Lowell Institute for Mineral Resources at the University of Arizona, underwrites the Outreach Program Coordinator position currently held by Pamela A. K. Wilkinson, a geologist and an educator.

At its annual fundraiser, the American Mining Hall of Fame honors the achievement of industry leaders. Including the 2014 inductees, 192 mining luminaries and organizations have been inducted and commemorative plaques of past honorees are on display at the Arizona Historical Society Museum at 949 E. 2nd Street in Tucson.

2014 Hall of Fame Committee

A. John Broderick - *Chair*
Mark Baker – *ex officio*

Roshan B. Bhappu
Lawrence G. Dykers
Donald F. Earnest
Theodore H. Eyde
John Fenn
Nancy Gracia-Gunger
William E. Hawes
Corolla (Cori) Hoag
Robert A. Metz
Nyal Niemuth
Eben Robinson
Thomas Scartaccini
Scott M. Shields
Timothy R. Snider
James Wm. White
William H. Wilkinson

Mining Foundation of the Southwest



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Armine Frederick Banfield, Jr.



Fred Banfield chose a career in mining after his father, Armine Frederick Banfield, introduced him to the industry. Armine Banfield was a well-known consulting geologist with worldwide experience. His achievements and professionalism served as a model for his son.

A graduate of Colorado School of Mines with a degree in mining engineering, Banfield founded Mintec from his Tucson apartment in 1970 and now presides over a global network of dedicated mining professionals. Still headquartered in Tucson, Mintec now has offices in eight countries and is committed to helping its clients solve their problems with MineSight - Mintec's comprehensive modeling and mine planning platform. The software offers integrated solutions for exploration, modeling, design, scheduling, production and delivers efficiency and reliability to help improve productivity at every stage of a mine's life.

The foundation of Mintec's business plan lies partly in Banfield's considerable wealth of expertise, including auditing reserve calculations and mine plans worldwide; the design and implementation of computerized systems

for building geologic models, calculation of grade estimates, mine design, and scheduling; the design of ultimate pit limits and mining schedules for open pit and underground mines based on economic and geotechnical data; calculation of reserves for metals, coal and industrial minerals; and the design and implementation of financial models for mining projects worldwide.

According to MineSight clients, Banfield always seems to be ahead of the industry working on solutions before problems arise. Banfield was the 2007 recipient of the Daniel C. Jackling Award for significant contributions to technical progress in mining geology and geophysics. Under his leadership, Mintec won the 2013 President's E-Award for Exports - the highest recognition any U.S. company may receive for making significant contribution to the expansion of U.S. exports.

Now a Hexagon AB company, Mintec's unparalleled longevity in a highly cyclical industry begins with Banfield applying his passion for mine engineering and computers to solving mine modeling and design challenges. After 44 years, a simple business model remains: Make the client successful.

Patrick E. Connor (1820-1892)

"Father of Utah Mining"

Patrick Edward Connor emigrated from Ireland to the United States at age 12 and at 18 enlisted in the US Army. He re-enlisted during the Mexican War distinguishing himself for courage and military skill. When the Civil War broke out, Connor was commissioned as Colonel to guard the overland mail route across the west.

In October, 1862, Connor moved his command to Salt Lake City and immediately encountered differences with the Mormons. He soon realized making the area appealing to outsiders would dilute the Mormon influence and encouraged prospecting which led to many silver discoveries. In 1866, Connor, now a General, left the Army, plowed his fortune and efforts into mining. He authored Utah's mining laws, introduced navigation on the Great Salt Lake, platted the town of Stockton and invested in developing mines and smelters but failed to profit by it, dying relatively poor in 1892.

Earl Tappan Stannard (1882-1949)

President, Kennecott Copper Co.

Earl Tappan Stannard, a Yale University graduate, was working for the Federal Mining Co. (a subsidiary of Guggenheim) in Missouri when he was dispatched to Chile to oversee the new mill construction and testing at Braden Copper Co. In 1913, Guggenheim next transferred him to the Kennecott Copper Mine in Alaska to improve its dated recovery system. While there, Stannard invented an ammonia leaching system increasing the recovery of copper carbonates to more than 95%. Additionally, he improved the concentrators to meet fluxing requirements of the smelters and introduced a flotation plant at the Beatson Mine.

During his tenure, Stannard steadily transformed Kennecott into a multi-national company and replaced Stephen Birch, his mentor, as President. On September 9, 1949, Stannard and other top Kennecott executives were en route to Canada to visit the newly acquired titanium plant when a bomb detonated killing all aboard and caused a crack in Kennecott's foundation.

Arthur Barrette Parsons (1887-1966)**Ernest R. Dickie (1902-1955)***Mining Editor and Author*

Arthur Barrette Parsons was born in Salt Lake City in 1887. While working on a farm at 17, he noticed mining engineers traveled by automobiles while the masses traveled by stage coach or horseback. This observation might have influenced him to enter the Utah School of Mines and he worked at various mines as assayer, surveyor and superintendent after earning his B.S. in 1909.

Later Parsons redirected his interest and became Associate Editor for *Mining and Scientific Press* and *Engineering and Mining Journal* and was President of Mineral Research Corporation. A member of AIME, he chronicled its history through 1947 and published more than 200 articles on the technical and political phases of the mineral industries but is best remembered as the author of *The Porphyry Coppers* in 1933, a seminal work detailing the history and technical information on the major porphyry copper deposits and on the 1956 update of the same work.

*General Manager, Bagdad Copper*

Ernest R. Dickie was born near Cripple Creek, CO but grew up in Arizona. He developed a friendship with John C. Lincoln while working at the Vulture Mine. Later, when Lincoln acquired control of Bagdad Copper Co. in 1944, he appointed Dickie to oversee the operation. Dickie quickly realized that the ore body was not suitable for underground mining and immediately implemented plans to convert Bagdad to an open pit mine. Converting the underground mine to an open pit mine was a major challenge and Dickie succeeded despite wartime shortages of materials and manpower as well as infrastructure issues related to remote areas. Bagdad was the first Arizona underground mine to convert to open pit immediately after World War II, ahead of the better publicized Inspiration and Ray Mines.

Dickie is best remembered for his equipment tests which led to improved mining equipment. Tragically, Dickie died prematurely at 53.

Corale L. & James A. Brierley



Brierley Consultancy LLC

The Brierleys met at Montana State University in Bozeman and subsequently married in 1963. Corale, the daughter of ranchers, grew up in southwestern Montana and sometimes rode Betty, her horse, to her one-room country school house. Jim, the only child of an immigrant single mother, developed his lifelong fascination with thermal springs when he accidentally stepped into one on his first trip to Yellowstone National Park at age 9.

While working on his post-graduate studies, Jim's extensive research led to the discovery of the first high temperature (thermophilic) acid loving microorganism - *Acidianus brierleyi* - named by German scientists in his honor. After earning his PH.D., Jim joined the faculty of New Mexico Institute of Mining and Technology (NMT) in Socorro and Corale often enrolled in his courses!

In 1982, Corale was approached to form a company to develop biotechnology for mining and founded Advanced Minerals Technology and Jim served as its Research

Director. The company with some 23 scientists and engineers developed and patented technologies for bioleaching and metal removal but was forced to dissolve when the stock market crashed in 1987. Jim then joined Newmont Mining Corporation as Chief Research Scientist and Corale soon followed as Chief of Environmental Process Development.

Laid off by Newmont, Corale began accepting consultant work in bioleaching and with increased requests for her service, founded Brierley Consultancy LLC in 1991 providing technical and business consultation to the mining and chemical industries as well as government agencies. Jim's confidentiality agreement with Newmont prohibited the Brierleys for the first time since 1963 to confer on technical matters, happily they were able to resume their collaboration when Jim retired from Newmont and became Principal of Brierley Consultancy in 2001.

Corale and Jim share many parallel career paths. Both earned Ph.Ds. in science, both received "Distinguished Achievement Award" from their respective universities, both are recipients of SME's (Society of Mining Metallurgy & Exploration) Milton E. Wadsworth Award, and both are inducted members of the U.S. National Academy of Engineering (NAE) for their demonstrated accomplishments in the pioneering of new technology. The first Brierley and Brierley technical paper was published in 1973 and many of their technical papers over the decades became the basis for the bioleaching technologies applied commercially today for copper and gold recovery - theirs is a true scientific partnership.

David E. Nicholas

*Past President & Co-Founder
CALL & NICHOLAS, INC.*

David E. Nicholas had no knowledge of mining or geological engineering until his University of Arizona dorm mate introduced Nicholas to his father, William C. Peters, head of UA's Mining and Geological Engineering department. Inspired, Nicholas changed his major from astronomy to geological engineering. He found his vocation.

After two summer jobs with Hanna Mining and earning a B.S. in Geological Engineering in 1970, Nicholas signed on fulltime exploring in Montana and Idaho for copper deposits. A transfer to Hanna's Pilot Knob underground iron mine in Missouri allowed Nicholas to focus on his major area of interest: underground rock mechanics. In 1972 Nicholas returned to UA for a Master's Degree in Rock Mechanics, studying under Drs. John Abel and Richard Call.

Under Call, Nicholas studied pit slope stability; under Abel, he studied underground rock mechanics receiving an M.S. degree in 1976 for his work at the Oracle Ridge underground mine. For inclusion in CANMET's 1977 pit slope manual, Call subcontracted Nicholas to develop a program to model the distribution of potential step paths.

After receiving his M.S., Nicholas worked for the consulting firm Pincock, Allen, and Holt, with Call and worked on slope design and underground mining projects worldwide: North America, Chile, Sweden, Botswana, Liberia, and China.

In 1979, Nicholas and Call formed a business partnership as independent consultants and in 1980 established CALL & NICHOLAS, INC. (CNI). Call and Nicholas grew the company and created a culture of collaboration and team effort. Through his work at CNI, Nicholas has



been instrumental in many large underground and open pit mine projects, including the Grasberg open pit mine and block cave mines at P.T. Freeport Indonesia. In 1982, Nicholas received the Robert Peele Memorial Award for his paper, "*Method Selection, A Numerical Approach.*"

With Nicholas's guidance, CNI has evolved into a world renowned consulting firm and currently has over fifty employees at its consulting, slope monitoring instrumentation and laboratory testing operation in Tucson, AZ. Today, Nicholas consults for longtime clients and enjoys mentoring young engineers and geologists.

Scott M. Shields

*Commercial & Sales Manager, US South-Mesa Operations
Joy Global Surface Mining*

Scott M. Shields is a fifth generation Arizona miner. In 1995 he joined the Phelps Dodge Morenci Mine as a Surveyor and despite his young age, was able to successfully implement new techniques, both conceptual and infield, to improve mine operations. Shields initiated ground breaking work with GPS integration and co-authored “*Optimization of GPS on Track Type Dozers*” and “*GPS in the Pits: Differential GPS Applications at the Morenci Copper Mine.*” This novel idea of building roads by using GPS without first conducting surveys won best of session at the Institute of Navigation conference and resulted in Shields being sponsored by Senator John McCain to represent Phelps Dodge Mining Company for GPS on the Hill.

During his tenure at Phelps Dodge and later with Freeport-McMoRan Copper and Gold Inc., Shields helped to develop Sulfide leaching with Bacterial Augmentation, Advanced Electrowinning technologies, Leach pad monitoring, and GPS Integration. While serving as the Autonomous Mining Program Site Coordinator, Shields supervised the construction of the San Juan Experimental Mine and was instrumental in laying the groundwork for a real autonomous mine of the future.

Shields left Freeport-McMoran in 2008 to earn a BS in Mining Engineering at the University of Arizona. While attending school, he was employed by the U of A as an associate mine engineer and was placed in charge of overseeing the design and construction of the new San Xavier Underground Training Center facilitating research funded jointly by mining companies, private organizations, and the government.



Although challenged with full time work and school, Shields was the winner of the 2008 Copper Club Scholarship, the 2009 Leonard Judd Freeport-McMoRan Foundation Scholarship, the Mining Engineering nominee for the Thomas G. Chapman fellowship and scholarship, the 2010 MMSA/SMEF Presidential Scholarship and was the U of A COE 2011 Outstanding Senior in Mining Engineering. In addition, Shields graduated Magna Cum Laude in 2011 and was inducted into Tau Beta Pi, a National Engineering Academic Fraternity.

Shields now manages a team of Joy Global Mining Engineers supporting the applications of P&H Surface Mining and Joy Mining Machinery Underground products. Notably he has provided optimization and best practice in over 60 mines and in 18 countries on five continents. Shields is an advisor for the University of Arizona ILB, Montana Tech MIAB, University of Missouri Science and Technology Advisory Committee, South Dakota School of Mines ECE Advisory Board and also serves as an Executive Committee Member and officer of the SME.

Empire Southwest

Empire Southwest is a family owned company founded in 1950 as Empire Machinery, an Eastern Oregon Caterpillar and John Deere dealership by Jack Whiteman. The name Empire originated from an area of the Pacific Northwest called the Inland Empire. However, when Jack was awarded Caterpillar's Arizona territory in 1959, he moved the company to Phoenix and began building partnerships with Arizona's mining and construction industries.

John O. Whiteman succeeded his father as CEO in the mid-1990s. Under John's leadership, Empire focused on customer service, encouraged community involvement among its employees, established the official Corporate Values and celebrated its 50th anniversary.

Third generation President and CEO Jeff Whiteman took the company reins in early 2002. He has led the company through the economic uncertainties following 9/11 and in 2008-2010 and through times of tremendous opportunity and growth. In addition to being a strong advocate for Empire's Values, Jeff has also instituted the 6 Sigma process improvement model and renewed Empire's commitment to supporting its clients, communities and employees. Under Jeff's direction, Empire continually ranks among the top Caterpillar dealers in the world. The company has more than 1,600 employees in a territory that includes the state of Arizona, southeastern California and portions of northern Mexico.

Mining makes up 40% of Empire's total market percentage and includes dedicated support for over 15 mine sites throughout Arizona, California and Mexico. Several of these sites are consistently awarded zero injury safety achievements and high client loyalty rankings in Caterpillar's Dealer Excellence program.

Empire's experienced mining support team is responsible for the sales and support of CAT and other allied products used in coal and metals mining applications. With the recent acquisition of Bucyrus by Caterpillar, the product line has been greatly expanded and includes everything from draglines and rope shovels, to skid steer loaders and small utility dozers.

Empire's goal is to provide mine-specific product and service solutions that help clients improve productivity, enhance safety, increase efficiency and lower cost per ton. Empire is proud to serve as an active partner in the mining industry and to support the efforts of their mining clients and the communities they serve.



Employees of **Rio Tinto Kennecott Bingham Canyon Mine**

In April 2013, the Bingham Canyon Mine experienced the largest mining landslide ever recorded. The 165-million-ton Manefay slide was a defining moment in Rio Tinto Kennecott's history.

Kennecott's single biggest achievement is that it detected, monitored and acted prior to the slide to ensure that no employees were injured.

With a primary goal of getting back to safely producing copper and recovering the business, employees were asked to rise to the occasion. Employees from across the operation responded in a singular effort to safely advance recover efforts.

To date, numerous achievements have been realized following the slide:

- Millions of tons of material have been moved to stabilize the slide area.
- Damaged buildings have been removed from the slide zone.
- Operations resumed 48 hours following the slide in non-impacted areas.
- Sixteen pieces of large equipment have been recovered, including 10 of the 13 haul trucks. Four of the recovered haul trucks are back in service.
- The mine access road was reopened and restored top-to-bottom access within the mine seven months ahead of schedule.
- Valuable components and equipment continue to be recovered from the slide area.

Kennecott has made significant progress since the slide, and it anticipates cleanup efforts will be completed by the end of 2015.

Rio Tinto Kennecott



American Mining Hall of Fame

Inductees (1983-2013)

1983	George E. Atwood	1999	Irl F. Engelhardt
1984	Charles F. Barber	2000	Ronald C. Cambre
1985	George B. Munroe	2001	A. Dan Rovig
1986	John C. Duncan	2002	J. David Lowell
1987	Plato Malozemoff	2003	Thomas J. O'Neil
1988	Simon D. Strauss	2004	J. Steven Whisler
1989	G. Robert Durham	2005	Pierre Lassonde
1990	Harry M. Conger	2006	Jack E. Thompson, Jr.
1991	Kenneth J. Barr	2007	Dennis R. Washington
1992	T.S. Ary	2008	Timothy R. Snider
1993	Milton H. Ward	2009	Tom Albanese
1994	J. Burgess Winter	2010	Richard C. Adkerson
1995	Douglas C. Yearley	2011	Laurence Golborne Riveros
1996	Richard de J. Osborne	2012	Gregory H. Boyce
1997	James R. Moffett	2013	James D. Toole
1998	Charles G. Preble		



Industry Partnership Awards (1995-2013)

1995	Caterpillar, Inc. - Glen A. Barton
1996	AMIGOS (Arizona Mining & Industry Gets Our Support)
1997	Colorado School of Mines
1998	Stephen D. Bechtel, Jr. and Bechtel Corporation
1999	Mineral Information Institute
2000	Modular Mining Systems, Inc.
2001	Mintec, Inc.
2002	Senator Larry Craig
2003	Aker Kvaerner
2004	Mining and Metallurgical Society of America
2005	Northwest Mining Association
2006	Mountain States Legal Foundation
2007	M3 Engineering & Technology Corporation
2008	Atlas Copco Construction Mining Technique USA LLC
2009	Boart Longyear Company
2010	Prospectors and Developers Assoc. of Canada
2011	Chilean Government/Industry Partnership
2012	Komatsu America Corp.
2013	Joy Global

American Mining Hall of Fame

Medal of Merit Recipients (1989-2013)

1989	Ralph J. Roberts	2002	Richard D. Call
1989	Victor H. Verity	2002	Kenneth L. Zonge
1990	John S. Livermore	2003	Stanley H. Dempsey
1991	George O. Argall, Jr.	2003	James Wm. White
1992	Arthur A. Brandt	2004	Edward S. Frohling
1992	William C. Epler	2004	Joaquin Ruiz
1993	Walter E. Heinrichs, Jr.	2005	Larry McBiles
1993	Willard C. Lacy	2005	Wayne C. Hazen
1994	Donnell W. Agers	2006	Leonard R. Judd
1994	J. David Lowell	2006	Roshan B. Bhappu
1994	Ronald R. Swanson	2007	William G. Davenport
1995	Warren Kay Pincock	2007	Harry Parker
1996	Richard W. Hutchinson	2008	Barbara A. Filas
1996	Charles L. Pillar	2008	Paul Arthur Hodges
1997	Hugo T. Dummett	2009	Mary M. Poulton
1997	Spencer Rowe Titley	2009	Jean Michel Rendu
1998	David N. Skillings, Jr.	2010	Terence P. McNulty
1998	José Rubén Velasco Rodríguez	2010	Nyal Niemuth
1999	Paul S. Allen	2011	Marco T. Einaudi
1999	William C. Peters	2011	Ralph B. Sievwright
2000	Leonard Harris	2012	David C. Lincoln
2000	Pedro Sánchez-Mejorada	2012	Matthew D. Lengerich
2001	William H. Dresher	2013	Joseph M. Keane
2001	Warren E. Fenzi	2013	Sean D. Dessureault

Mining Foundation of the Southwest

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 A. John Broderick - *Vice President*
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 Eben Robinson - *Treasurer*

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 A. Dan Rovig
 James Stephens
 John Van De Beuken
 Pamela A.K. Wilkinson
 Theodore Winkelmann

In Memoriam

William H. Dresher
 Willard (Bill) C. Lacy
 P.K. (Rana) Medhi
 David C. Ridinger



MFSW Outreach Coordinator
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SPECIAL THANKS

The American Mining Hall of Fame Committee of the Mining Foundation of the Southwest thanks Modular Mining Systems, Inc. for its continued support by typesetting/design and printing this program.

