NEWS BULLETIN OF THE MOLES
AN ASSOCIATION OF INDIVIDUALS ENGAGED IN HEAVY CONSTRUCTION
HOLING THROUGH

JULY, 2017

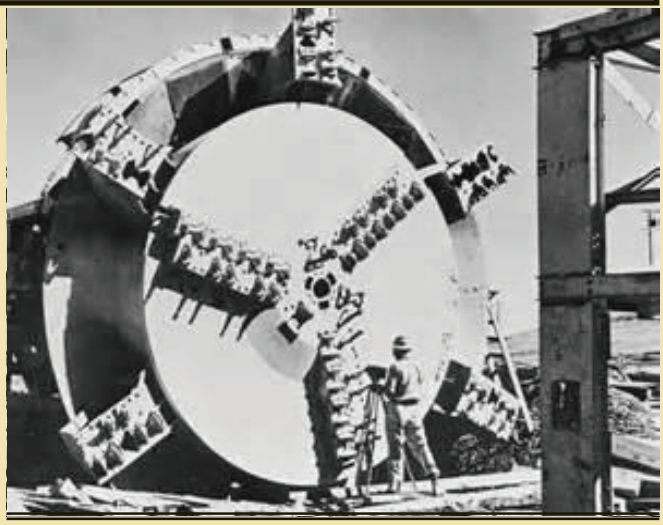
TBM - Carving the Way to the Future

It has been eighty years since The Moles' founding members met in New York City. Our organization is a unique combination of history, rich in ingenuity and nostalgia, and relevancy in today's world, where our members continually meet the current demands of efficiency and innovation, and their engineering dreams do often come true. In researching the history of the Mole, the Tunnel Boring Machine ("TBM") kind, I came across a wonderful article Fred Hapgood authored entitled, **History of the Tunnel Boring Machine** from which I want to acknowledge that in a very large part this article was derived and much of the credit should go to Mr. Hapgood for his excellent literary work:

The first attempt to build what could be classified as a modern Tunnel Boring Machine was by a Belgian engineer named Henri-Joseph Maus, who in 1845 got the King of Sardinia to approve construction of the first railroad connecting France and Italy. Maus had an international reputation in mining engineering and the self- confidence to match. He shrugged off the idea of running a line up and over a pass, insisting that the right idea was to go straight through, specifically, through Mt. Frejus, near the famous pass at Mt. Cenis. A tunnel following the route Maus had in mind would have stretched for 40,000 feet, a highly impossible distance given the technology of the time. In that era the tunneling cycle ran as follows: drill holes in the face, pack them with gunpowder, light the fuse, run around a corner, wait for the explosion, run back carrying bracing timbers, hope you could hammer them into place before you got killed in a roof collapse, and shovel or toss the rock fragments into carts for removal.

The problem was that detonating gunpowder in a confined space saturated it with toxic fumes, so all this activity depended upon sucking the air polluted by the previous blast out of the tunnel in a reasonable length of time. Maus' tunnel was way too long for the ventilating technology of the time to deal with. Maus had of course thought of this: he planned to dispense with blasting altogether with the world's first tunnel boring machine, Maus' "mountain-slicer," as it was dubbed, took shape in an arms factory near Turin in 1846. It was big and complex, larger than a locomotive, bristling with over a hundred percussion drills, all set in a forest of cams and shafts and gears and springs. Functional or not, it was enormously satisfying to contemplate, and tourists came from near and far to admire it as a monument to the age, more as a piece of art than a tool.

After the political convulsions of 1848, which left Europe feeling less optimistic and expansive in every sphere, Maus' funding was pulled. (Ten years later a tunnel was built close to Maus' route, but it was done with drill and blast, and relied on vastly improved ventilating technology.) With variations this story was repeated around the globe year after year: an enormously challenging project, a brilliant engineer, an awe-inspiring piece of machinery, admiring throngs, enthusiastic speeches about the inevitability of human progress, and finally, disappointment. For example in 1851 Richard Munn & Company of South Boston built a huge machine (for its time; 75 tons) for a tunnel through Hoosac Mountain in northwestern Massachusetts. It jammed before it had gone ten feet. The Hoosac project itself, which had been sold partly on the promise of the machine, bogged down and became something of a scandal.



The "Mittry Mole", Robbins' First TBM

Fast forward to 1952 when James Robbins welcomed a tunneling contractor named F. K. Mittry into his office. It is an integral part of this story that the people who dig tunnels were and still remain today, a different breed than the contractors who construct hotels and office buildings. First, tunnel construction is highly stressful, both physically and mentally. The working area is tiny, the lighting is usually terrible, there is water everywhere (to be more specific – the weather is always 65 degrees and raining!) and the constrained dimensions mean you are generally about two inches from having your arm torn off by some enormously powerful machines. The medium, the ground, might switch carts and pulling the carts away from the face. For the To-

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phases instantly to anything from anything, from tough limestone to water-saturated gravel to sand to granite to mud, and any of those changes can plunge an excavation into disaster. While the money was excellent, the risks of bankruptcy or injury or death were higher than normal people like to bear (which was why the money was excellent). Tunneling selected risk-tolerant, larger-than-life characters who liked long odds and big bets and could endure serious physical stress for long periods.

Mittry was just such a character (and for that matter, according to Richard, James Robbins was also a bet-the-company, dam-the-torpedoes, guy himself). Mittry had just won a bid to dig a water diversion tunnel for a dam just outside Pierre, South Dakota. As it happens, the bedrock around Pierre was so riddled with cracks that geologists had a specific label for it: Pierre shale. The fragility of Pierre shale made it very scary stuff to blast in. Mittry had just gone ahead and bid and won the job. Now that he had won, he was visiting consultants, shopping for tunnel boring machines ideas. He had come knocking on the door of a coal mining machinery expert and James Robbins had an idea for him! The mining industry had just begun working with a technique for cutting coal that used no blasting. The idea was to push a group of metal fingers or picks, like the tines of a fork, into the coal face and then rotate the group, scoring deep circular cuts into the coal. Freely rotating "wedging wheels" or "bursting wheels" were suspended between the tines; these shattered the weakened mineral off the face. The head carrying this pick and wheel assembly would rotate once, then retract, the coal would be shoveled up, and the process would repeat.

Of course the application contexts were very different. To begin with, tunnels have to be dug to a much higher degree of path precision than a mine, and the dimensions were totally different. However, Mittry was low on alternatives and commissioned Robbins to build a machine based on the pick and wheel idea. He took delivery in 1953.

Like all such machines, Mittry's Mole (pictured on pg. 1) was impressive to look at: 125 tons, 90 feet long, with a diameter of almost 26 feet. Unlike its predecessors, it was impressive in performance as well. The rotating plate shattered the rock like so much peanut brittle, pushing the tunnel out at rates of up to 160 feet in 24 hours. This was a breath-taking number, almost ten times faster than most contemporary drill and blast projects. Robbins might not have built the world's first TBM but he had done better: He had built the first one that worked. He had beaten decades of the profession's most famous minds, and done so emphatically.

Such a feat begs for a moral. Perhaps the lesson is that important innovation is not just a matter of ambitious vision or engineering research in academic institutes; perhaps sometimes advances are made when good engineers are tightly focused on the specific problems of a specific client. That's a plausible inference and soon it was tested. The success of the machine on the Pierre project prompted Mittry to order several more and they all performed wonders on those small flurry of contracts but had major problems in harder rock elsewhere.It turned out that Robbins had been lucky: the same properties of Pierre shale that had made Mittry reluctant to blast, that had made him so open to alternatives, also made the rock a perfect medium for Robbins' technology. The rotating head had shattered the rock so effortlessly because, from a geomechanical point of view, it might as well have been glass. Few contractors were lucky enough to find such accommodating material on their jobs.

Now that a number of engineers, Robbins, his crew, Mittry's crew and the visitors to the Pierre site, had seen a tunnel boring machine work the way it was supposed to, Robbins now knew in his bones that TBMs were a very big deal, despite all the problems that no doubt lay ahead. He started James S. Robbins and Associates (later, The Robbins Company), the first company dedicated exclusively to the manufacture of tunnel boring machines.

One of his early projects was for a sewer in Toronto. The headache here was that the drag picks kept hitting hard rock and snapping off, which meant shutting the machine down for maintenance, over and over, wasting time (Not to mention that the drag picks themselves were not cheap). Robbins kept searching for the open door his gut told him was there. One day he decided to strip the picks off the rotating head altogether. That was counter-intuitive, since the theory was that the picks were primarily responsible for the cutting, with the discs basically just cleaning up. But the engineer's intuition proved out: the TBM ran just as fast as before, only without the pit stops. It turned out that the bursting wheels, which now started to be called "cutter" discs or wheels, had been doing the real work all along.

In retrospect it is easy to see why. Every natural rock is riddled with cracks and flaws on several scales. When the cutter wheels pushes down on the rock, the compressive force introduced is concentrated around these weaknesses, with most of the compression organized around the worst flaws. Exert enough pressure and the cracks will extend into the medium. When the wheels roll on, the cracks spring open, splitting the rock yet further. All this happens in order of weakness; making the bigger flaws even bigger. The difference between cutter wheels and drills was like the old story about a skilled jeweler and an amateur: the professional knows how to find and exploit the natural flaws in the gem, and so can make his cuts with a few taps. The amateur has to hammer away all day. Cutter discs enormously improved the efficiency with which energy could be channeled into cutting rock.

The Toronto project was important in another respect. The most taxing and time-consuming part of tunneling is not

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ronto machine Robbins set up an ingenious system of buckets that rotated with the cutter plate, scooping the "muck" up off the floor and dropping it on a conveyor that carried it back for disposal. With this bucket-and-conveyor system Robbins had extended the automation challenge another step: the tunnel boring machine had become a tunnel-boring- and equally important a muck-extraction machine.

By the late 50's TBMs had developed to a point where Maus and Mittry would have recognized it as the embodiment of their dreams. When the machines worked, which granted was by no means all the time, they tunneled at two to three times the rate of drill and blast through the same ground. Such speeds represented huge savings. In theory, at this point the contracting and client community would have recognized that the day of the revolution was at hand. A better mousetrap had been invented, and the world should have beaten a path, etc. In reality nothing of the sort happened. Most of the contractors stuck with drill and blast. They had several reasons for holding back. Up till then tunneling had been a pay-as-you go operation, with low capital and high operating costs. TBMs had to be paid for up front and were not cheap (about a million and change). In the terms of the trade, they imposed very high mobilization costs. Tunneling contractors would need serious adjustments financially.

Most important, the machines were not reliable. Humans may have been slow, but if you put a crew underground you could pretty much bank on getting at least some footage every day. A TBM went faster when it was going, but when it broke down you might have to waste days waiting for Robbins to fly in a part or an engineer. Or you might need to disassemble it and pull it out of the tunnel to do the repairs. If it hit the wrong ground it could literally shake itself to pieces. In the very worst case, where the TBM had to be abandoned altogether, the tunnel would have to be completely rebuilt to accommodate human crews. This would be disastrous for a contractor working under a serious penalty clause. True, tunnelers were gamblers, but even gamblers have their preferred ways of risking their money.

Unfortunately in 1958 James Robbins died in an airplane accident. This was the worst possible time for the struggling new technology to lose its Moses. Contractors might not have known anything about TBMs, but they knew, liked, and trusted Robbins, who was skilled, ingenious and knew the business. When he died contractors had no one to turn to. His son Richard (a Moles Member since 1979) took over the company, he was a young man, only out of Michigan Tech for a couple of years, and an unknown face in a community that valued experience above all.

The company swung from client to client until the late 60's / early 70's, when the technology got lucky again. Following relative success on the A6/A9, a Morrison Knudsen J.V. tunnel project on the D.C subway, Chicago announced a humongous tunneling project, the biggest in history at that time. Every tunneling contractor in the country scrambled for the plans and specs where in the fine print they found something hair-raising specification language: no contractor was going to be allowed to bid on the project unless he brought a TBM to work with. The Chicago project forced the TBM tunneling machine business into overdrive! The tough bedrock that ran under the city was right at the edge of what the TBMs of the day could handle. On the other hand, the TBM technology that held out the only chance of getting the work done in a working man's lifetime was just irresistible. Public Works is a famously risk-aversive profession, but this time the city engineers decided to throw the dice. To overstate slightly, from a contractor's point of view, the Owner imposed a requirement that no one was sure to meet for a job that no one could afford to sit out.

All across the world the big construction equipment companies, like Hennenknecht, Hughes Tool,Krupp of Germany and Ingersoll Rand, set up their own R&D operations, competing with each other to make the biggest improvements fastest. "When the project began, the hardrock tunneling record was about 600 feet/month," recalls Howard Handewith, who worked in Chicago. "Whenever we had a month of more than a thousand feet we had a party. We had some humdinger parties." (Tunnelers are famous for their parties.) Gradually the machines grew tougher and faster. 1500 ft/month became routine, then 2,000. "This is where the TBM industry grew up and cut its boring teeth, so to speak" Handewith said.

Today a serious TBM often turns in a production rate of 4,000 ft/month. The newer models come with automatic lining installers, with a robot arm that picks up pre-cast lining segments and clicks them into place around the freshly created interior walls like so many Lego bricks. Such machines integrate all the functions of tunneling into a single device. They can cut through almost any kind of rock and often carry high-tech imaging devices that allow them look ahead capability. There are now probably around 120 of these TBM machines working at any one time around the world.

In a future Holing Through I intend to continue the history of TBM development and the success record of the modern day machines from about 1977 Chicago, where the TBMs were grinding away on TARP project, right up to the present day when suddenly Elon Musk (Tesla and SpaceX) announced his own revolutionary ideas of how his unique methods will drive the tunnels of tomorrow.

~ Tom

NEW MEMBERS

Front Row (L-R): Ro DiNardo, Wally Caban, Ozzie Calderon, Terry Holman, Andy Burns, Jamey Barbas, Vinny Sefershayan, Frank Corradetti, Sitotaw Fantaye and Michael Moore.
Back Row (L – R): Jim Brady, Jim Stevens, John Civetta, Mark Pelletier, Kevin Hughes, Joe Lark and Giuseppe Quarta.

Jamey Barbas is a well-recognized engineer concentrating on complex and long span bridges. Jamey is currently leading the management for the NYS Thruway Authority on the mega design/ build project to construct the replacement twin span cable-stayed bridges for the aging Tappan Zee Bridge. She holds a MSCE from Columbia University.

The son of a well-known tunneling expert and 40 year Mole member, **Jim Brady Jr.** .surely didn't fall far from the tree. Jim is a graduate of the Colorado School of Mines with over 30 years' experience in the design and construction of major tunnel projects and underground structures. A P.E. in four states, Jim is a Senior Associate with Aldea Services based out of Atlanta.

Andy Burns, now with Underpinning and Foundation/Skanska, has worked on deep foundation and underground construction in the greater NYC area for over 20 years. Andy recently served as President of the N.E. Chapter of ADSC – the International Association of Foundation Drilling.

Wally Caban, Chief of Construction at the Port Authority of NJ and NJ, holds a position held previously by noted Moles members Ray Monte, D Paul Nicholson, Dick Leahy, Ray Finnegan and Jim Starace. After many years with Aviation Construction at PA airports, Wally now provides Construction Management services for the multi-billion dollar PA wide Capital Construction Program.

A mole animal is known for working continuously underground; knowing **Ozzie Calderon** for nearly 20 years, he really is a true Mole in every sense! With a BSCE, MSEE and MBA degrees, Ozzie has managed mega projects for Yonkers Contracting, many for the Port Authority at the WTC and PATH. He also finds time to volunteer with ACE and Manhattan College where he encourages high school students to pursue engineering degrees.

Jack Callahan is a CPA with over 25 years' experience in the accounting field and leads the Construction Industry Practice for CohnReznick. He was assigned as a lead partner working for the PA overseeing the work being done at Ground Zero and the new World Trade Center Transportation Hub.

John G. Civetta is a V.P. at John Civetta and Sons Inc. A 1983 graduate of Rensselaer Polytechnic Institute, John is responsible for estimating through project management. John joins his father Ted Sr., his brother Ted Jr. and his Uncle John Jr., as a Mole Member!

Robert Cooper is the General Superintendent at Tutor Perini Corporation. He is responsible for their planning and directing of day-to-day field operations. Bob is an active member of the Executive Committee of the GCA of NY and is a member of their Labor Relations and Contract Negotiations Committees.

Under the leadership of **Frank Corradetti**, West Bay Construction has become a viable member of the Philadelphia area contracting community. Frank and his firm have been recognized for improving the relationship between all the parties involved in the construction process.

Craig Sean Covil is a Principle with ARUP in New York City. Recently he was responsible for such major NYC projects such as the Fulton Transit Center, the 2nd Ave. Subway and various storm hardening projects for the New York City Transit.

A long time employee of John P. Picone Inc., **John Culkin** is presently their Vice President and Chief Estimator. A graduate of Virginia Tech, John has worked on many NYCTA and

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NEW MEMBERS

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NYCDEP projects in addition to the NYSDOT FDR/East Side Drive award-winning Rehabilitation Project.

Ro DiNardo, was recently promoted to Project Executive at Granite Construction in addition to being an Area Manager for Tappan Zee Constructors on the Tappan Zee Project. He remains active in the NY area construction community and is Granite's representative at the GCA's Executive Committee.

Sitotaw Fantaye, a Partner of MRCE, was born in Ethiopia and immigrated to the U.S. in 1985. He is a recognized leader in the design of deep foundations, underpinning, cofferdams and marine structures. We wish him well in filling the shoes of many legendary MRCE retired engineers such as George Tamaro and others!

Richard France, a graduate of the University of Maine, has been involved in numerous infrastructure projects in the NY area. Rich recently joined Railroad Construction Co. and has already proved to be an active Mole by attending lectures and events at our recent Winter Meeting in Aruba!

Larry Gillman is the Operational Vice President with Skanska in the NY Metro Region, responsible for several major projects such as the "K" Bridge, 91st Street MTS and Second Ave Subway contracts.

Don Hickey, a graduate of Manhattan College, has worked nearly exclusively on tunnel projects for over 20 years, including City Water Tunnel #3; major Con Edison utility tunnel contracts; East Side Access Tunnels and presently on completion of the Second Ave Subway. Don is Judlau's Operation Manager.

Terence Holman, presently the Chief Geotechnical Engineer with Turner Construction Co., is a Registered P.E. in seven states. He has over 20 years' experience in geotechnical and geostructural engineering, design and heavy construction. Dr. Holman is a frequent lecturer at national and international conferences.

Kevin Hughes is Area Manager of Kiewit's Eastern District and most recently Project Sponsor on the P3 Goethals Bridge Replacement Project and before that the Willis Ave Bridge Replacement Project.

Walter Kaeck is a partner with MRCE, where he has worked since graduating from Cornell University and Cooper Union. He is a co-author of the textbook, Construction Dewatering. Walter's skills include a full range of foundation consulting services.

Dennis Yat Lam is the Chief Engineer for Skanska where he is actively involved in both the engineering and construction aspects of their Heavy Construction Projects. He has contributed on many of their most challenging underground projects in the Northeast.

A long-time employee of The Lane Construction Corp., **Joseph Lark** has been responsible for such major projects as the Capital Beltway, I-95 Express Lanes, I-4 Ultimate, I-35 E in Dallas and the Washington Metro Purple Line. He presently is Senior V.P., overseeing for the P3 Major Projects Group.

Ryan McCourt is the President and CEO of The McCourt Construction Company. Besides actively managing the firm's individual projects, he is also heavily engaged in heavy construction professional organizations including CIM, UCANE, ARTBA and FMI.

Paul Monte, a partner with Peckar & Abramson P.C., has practiced construction law for over 30 years. As lead counsel, Paul has represented heavy construction companies in resolving complex construction disputes. He is a graduate of Brooklyn Law School.

Lawrence Moore II is the Director of Clark Foundations in Washington D.C., a subsidiary of the Clark Construction Group. His past experience includes cut and cover, NATM and TBM tunnels, highways, water treatment and heavy construction projects throughout the States.

Michael D. Moore is CEO of ADSC, the International Association of Foundation Drilling, which promotes the education, knowledge-sharing and collaboration between public and private entities for quality drilled foundation construction. Michael resides in Texas, holds a B.S. from Texas Christian University and played professional baseball for several years post-college with the Milwaukee Baseball System!

Pamela Moran, a Director at Wisco America Inc., has spent more than 25 years in the underground construction industry providing waterproofing systems for tunnels, shafts and other underground structures. She is a Registered P.E. in nine states and has published and presented numerous technical publications at various tunneling conferences.

Mark Pelletier, a V.P. at STV Inc. manages the Boston STV Office and also is the Principal-in-Charge of STV's effort on the Fore River Bridge and Longfellow Bridge rehabilitation projects. Mark has been active in numerous professional organizations, having served as the Chair of the Boston Society of Civil Engineers Construction Group and President of the Massachusetts Society of Professional Engineers.

Since joining the Port Authority in 1985, **Steven Plate's** operational responsibilities have included airport facilities, airport access programs, rail transportation facility development, bridge construction and rehabilitation throughout the PA. His more recent accomplish-ments include both the AirTrain JFK Transit System and the iconic World Trade Center Project.

Already familiar with The Moles due to the Panama Canal lecture he presented at a recent Winter Meeting, **Giuseppe Quarta** is now officially a Mole! Giuseppe is EVP of P3, Large Projects, and Tunneling of Lane Construction and President of S.A. Healy Company. Giuseppe has 35 years' experience around the globe in the hydroelectric industry, mechanized

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NEW MEMBERS

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tunneling, hydraulic structures and most recently the Panama Canal project.

Leo Ryan is presently COO of J.F. White Contracting Company, where he has over 35 years of service. He has overseen numerous heavy construction contracts in the Boston area but has assured me that he will come to NY often to participate at Moles events and meetings especially since it allows additional opportunity to visit with his daughter who is an instructor at Princeton.

Vincent Sefershayan, employed by Judlau Contracting since 1999, is currently the Project Manager of the Queens Midtown Tunnel Rehabilitation. A licensed P.E. in New York and New Jersey, Vin has represented Judlau at numerous GCA, ARTBA and P3 conferences.

Christothea (Chris) Sklavounakis, a graduate of Columbia University, has worked on major projects while with the NYSDOT, subsequently at the MTA she was involved with the East Side Access Program. Chris is a Vice President at HDR, concentrating on New York and New Jersey mega Design/Build Projects.

Jim Stevens, a V.P. at Michels Tunneling, is a well-known manager in the heavy and underground construction industry. He has managed a number of high profile projects including the San Francisco Bay Tunnel, Beacon Hill Tunnel and the Hoover Dam By-Pass. He received the *Golden Beaver Award* in 2015 and was named as an ENR *Top 25 Newsmakers* that same year.

Terry Towle, a Senior V.P. at Flour Enterprises, is the President of the JV Tappan Zee Constructors, currently constructing the new Tappan Zee Bridge, the largest ongoing public works project in America. He has extensive experience with infrastructure projects both in the United States and overseas.

Joseph Vaccaro, Vice President of Estimating at Railroad Construction Company, has had extensive experience with heavy construction contracts of numerous disciplines throughout the New York/New Jersey area. Joe has been very active and presently is a Trustee with the ACC of New Jersey.

Nancy Vliet Cucco P.E., a graduate of Virginia Tech, has worked in the heavy construction Industry for over 20 years. She is a Senior Vice President at Ferreira Construction Co. ,where she is in charge of construction contracts both in New York City and Ferreira's California construction office.

Timothy Watters, President and owner of Hoffman Equipment Company, a major distributor of cranes and earthmoving equipment among other equipment, was welcomed into The Moles in the Associated Occupations and Sales category. He has extensive experience the certification and inspection of major cranes manufactured by the leading suppliers of cranes in the U.S.

A long-time employee of Yonkers Contracting Company, **Thomas Whelahan** has been a Principle Supervisor on numerous major roadway, bridge and airport projects in the greater NYC area for various owners. He is a graduate of the University of Delaware and is a PE in New York State.

Front Row (L-R): Don Hickey, Tim Watters, Steve Plate, Pam Moran, Larry Moore, Chris Sklavounakis, Rich France, Nancy Vliet Cucco, Dennis Lam and Walter Kaeck.
Back Row (L – R): Robert Cooper, Joe Vaccaro, Leo Ryan, Tom Whelahan, Terry Towle, Larry Gillman, Paul Monte, John Culkin, Ryan McCourt and Jack Callahan. (Not pictured: Craig Colvin)

Annual Business Meeting—May 3, 2017

The Moles Annual May Members Dinner marks the end of the president's one year term. We thank outgoing President Richard D. MacDonald (*left*) for his leadership and welcome Christopher S. Traylor (*right*), seen here accepting the honorary gavel.

Thomas DiPonio, Joseph Sopko and Scott Hoffman presented an informative lecture entitled, "Ground Freezing For The First Street Tunnel, Washington, DC. for our guests. We continue to be grateful to our guest speakers who offer their time and expertise in sharing their experiences with Moles

The Moles honored members celebrating their 40 years of membership. (Left-right): Marvin Lifson, Bernard P. Monahan and Gerard A. Neumann, Jr. received their Life Membership certificates in person. Charles M. Aiken, Joseph Di Miceli, Roger J. Ludlam, Charles B. Molineaux and Julius Nimorwicz were unable to attend. Fifty-year members, Kenneth P. Felsburg, Jr. and William C. Perkins were there in spirit!

Moles Members, new and old, enjoy the friendships they forge on the job and at Moles events hosted throughout the year! At left, Joseph Vaccaro, Bill Marino, Al Daloisio and Jack Callahan clearly are talking shop while at right, the Traylor Brothers - Moles President Chris; The Beavers' current President, Mike and Tom, represent their family's third generation of Moles Members!

A Glimpse Into Our Past - The "Sevens" by John Eckart

A Look into our Moles' History through the "Lucky 7" Decades:

1937

Excerpted from a letter from James H. Fitzgerald of Fitzgerald & Hudson, Inc. to Robert K. Tomlin of the "Construction Methods" magazine, describing the formation of The Moles:

A Mole was Born

It was a bad night, in the winter of 1937. A blizzard was at its worst, when Hesheorit staggered through the office Portal. From the snow encrusted lips came the single word "Jimmie".

The situation was fraught with danger but I struggled with my delicate burden to the couch. I was horrified at that moment; it seemed that not only one life but two was about to pass away from an unappreciative world.

In my hysteria I tore open the humble little Bundle that Heshe had under her arms, hoping for a Layette or "something". I found it, a quart of Eagle Rye. Without hesitation I poured a half of it down Heshe's throat and placed the empty bottle in the waste paper basket.

At that moment succor, "not sucker" arrived. It was Barney Hardin, a Rock Drill foreman and his son Donald. As Donald was only 20 years old, we locked him in the safe and Barney and me wore out the rug walking back and forth.

Then Harry Leeuw arrived. He immediately took over and got medical assistance just in time, so at midnight it happened and Heshe gave birth to an Idea. The damn thing got under the desks, behind the chairs, and all over the office. Before Leeuw got hold of it, Harry realized that the little rascal was going places. We all thought, Heshe had labored and brought forth a mouse, but a few weeks later Al Seilke agreed with the majority and we called it a Mole.

We had the little fellow on our hands, so Harry Leeuw volunteered to act as President, Sielke as 1st Vice President and me as 2nd Vice President and He She or It who is the actual Founder, Originator, and sole person responsible for the Organization today accepted the title of Secretary and Treasurer. "There wasn't any funds", nothing but work. So summed up, Aleck Stagg was the Father, Mother, She, He or It, meaning the Goat if it flopped.

Medical history may prove it is impossible to be all three, but in this case I would agree to argue it out.

[On March 9, 1938, at The Moles' first Annual Business Meeting, Harry Leeuw was elected President of The Moles, Albert Sielke was named 1st Vice President, James H. Fitzgerald 2nd Vice President and Alex M. Stagg, Secretary and Treasurer. Barney and Donald Hardin, hardrock tunnel men, were among the founding members of The Moles.]

1947

At the May 7, 1947 Annual Membership Meeting of The Moles, Charles B. Spencer, of Spencer, White & Prentis, Inc., was elected the new President of The Moles. Mr. Spencer was not only a distinguished engineer and contractor in the fields of underpinning, cofferdams and subway and foundation construction, he was also a renowned poet. One of his most popular works was the tribute to his friend and partner, Edmund A. (Ted) Prentis' victory in the golf pitching contest at the 1946 Moles Clambake:

Prentis on the Tee

There were expert golfers by the score
To burn up eighteen holes,
But how they'd fare at just one shot
Was the problem at the Moles.

Six hundred men of brain and brawn
Are trembling in their boots.
The crowd stands still with bated breath
As mighty Gillen shoots.

He swings – alas! Six hundred groan
As Gillen dubs the shot.
Macdonald tries and lifts his head
And Spencer's not so hot.

But look! Emerging from the crowd
A man well known to all –
No Mole that day could dare to hope
As Prentis seized his club.
Could honor lost when experts failed
Be salvaged by a dub?

Like ray of hope the white sphere glows
Straight speeding toward its mark.
Six hundred throats let out a roar
That rends Long Island skies.
The little flag smiles on the ball
That close beside it lies.

The shot that started World War II
Is bedded in our souls
No deeper than the shot that day
That beat six hundred Moles.

Originally printed in the December 1946 edition of ***Holing Through***]

1957

On February 1, 1957, George W. Rogers, A Moles member since 1942 & President of the George W. Rogers Construction Co., was awarded the first New York City Fire Dept. Certificate of Merit ever presented to a non-fireman

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A Glimpse Into Our Past - The "Sevens" (continued from pg. 8)

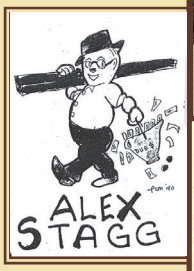
The blast, which killed 10 persons and injured 270 more, resulted in "major destruction" within 1000 ft. radius, broken glass within a one-mile radius and was heard up to 35 miles away. Mr. Rogers provided a diver, launches and equipment to the Fire Department, at no cost to the City, in order to investigate the cause of this major explosion. Turns out dockworkers using an acetylene torch to cut a column of the structure ignited a pile of 13 tons of foam rubber scrap and when the fire reached a stockpile of 18.5 tons of Cordeaux Detonant Fuse stored on the pier, the explosion occurred, destroying the Luckenbach Steamship Co. pier.

The flying debris was said to have caused all the deaths, including one a thousand feet away from the blast, also starting a fire at Erie Basin in Red Hook, half a mile away.

Many new safety policies were initiated as a result of this tragic accident, including training of dockworkers, limiting hazardous materials to specified restricted areas, special labeling of containers holding explosive materials.

1967

On September 26, 1967, Alex Stagg, one of the three founders of The Moles, passed away in Delray Beach, Florida. In 1936, Mr. Stagg was the owner of the A.M. Stagg Lumber Company in Jersey City, NJ and in those years had provided timbers and lumber to many of the large heavy construction projects in the New York City. Mr. Stagg had become acquainted with the tunneling men that gathered together for reunion dinners in 1936 and 1937, from which The Moles was born.



Along with Harry Leeuw and Al Sielke, Mr. Stagg was instrumental in the official formation of The Moles and, on March 9, 1938, was named the first Secretary/ Treasurer of The Moles, a position in which he served until he was elected to serve as its President in 1941.

1977

Those of you who have met Gary Almeraris, this year's Chairman of the Award Committee, know he's "one in a million". Not only has he supervised the completion of some of the East Coast's biggest tunneling jobs, from Boston to Washington, D.C. and beyond, but as Skanska USA Civil's leading tunnel expert he has recently managed the completion of Skanska's portions of the 2nd Avenue Subway, the No. 7 Line.

Now most of you would be quick to attribute Gary's unparalleled success to a unique combination of education,

U.P. ASSN. PHOT

Extent of fire shortly after explosion. Operations of land companies are confined to the shore end while fire in balance of pier must be fought by marine forces. Ineffectiveness of streams from boats where roof has not yet collapsed is very evident. Damage to walls of one story warehouse in right foreground of photo can be seen. Sprinkler piping in this building was broken in many places.

After Gary Almeraris won ***both*** Wheel of Fortunes in 1977, a new rule was implemented preventing anyone from being as lucky!

(Continued on page 10)

A Glimpse Into Our Past - The "Sevens" (continued from pg. 9)

mentorship, knowledge, enthusiasm, innovative ideas, leadership and hard work. But what about ***HUMILITY*** and ***LUCK***?! We share here a little known fact: At the 1977 Moles Clambake, two short years after Gary's graduation from CCNY, when Gary was no more than a Field Engineer for MacLean Grove, Gary won not one, but **both** Wheel of Fortune drawings, walking away with two Polaroid SX-70 cameras! We calculate the chances of one person winning both WOF drawings at the same Clambake as "one-in-a-million", proving Gary is the luckiest Mole ever! Why Gary chose to work the last 40 years rather than play the Irish Sweepstakes at least once back in the day and never work a shift in a tunnel again is anyone's guess! By the way Gary, where are those cameras now or at least some of those Polaroid pictures that you took that hot day in 1977?

1987

The Moles' 50th anniversary was celebrated in 1987. From the "original" 35 members who had signed up and paid their $5.00 dues in 1937, the organization grew to 550 active members by 1987, plus honorary, life and emeritus members. The "idea" had grown beyond the wildest dreams of Leeuw, Sielke Spooner and Stagg. President Steve Greenfield appointed a blue-ribbon committee to memorialize this auspicious milestone in the history of The Moles. The Committee, working with Bill Youngs (who had written a history of the first 25 years of The Moles for *America's Builders Magazine* in 1965) set about recording the history of the first 50 years of the Moles. The Moles First 50 Years; The Greatest Joint Venture in the World featured not only the early titans of the heavy construction industry: Moses, Moreell, Crimmins, Scott, Spooner, Spencer, Kiewit, Steers, Perini, Atkinson, Ferris, Kaiser, Slattery, Dillingham, White, Parsons, Zachry, Hendrickson, Fluor, Roe, and Kenny, but the educators of us all: Terzaghi, Proctor, Casagrande and Peck. This book served to document that The Moles had accomplished the overall purposes to which the organization was founded, the most primary one being:

To provide voluntary aid and assistance to the members of the contracting and engineering profession; to protect and cement the past and future friendships and the spirit of fraternization among members and to assist members in every legitimate way possible to secure work and provide information which may be of assistance.

Copies of the 50th Anniversary book are available at The Moles office or can be viewed on our website.

1997

In late 1996, The Moles' Scholarship Fund Advisory Committee was established, with Steve Greenfield, 1986 President of The Moles, named as Fundraising Chairman. This was the initial year of fundraising for this new, philanthropic initiative of The Moles. The announcement in the November 1996 issue of **Holing Through** included the following appeal to Moles members:

> Now it is time to give back to a new generation some of the success we have garnered. What better way than to assist deserving civil engineering students in pursuing their education. Some of these students will likely form the next generation of Moles.

In its first year of fundraising, the Scholarship Fund received approximately $500,000.00 in donations and pledges toward the Committee's initial goal of $2,000,000. In late 1997, the Scholarship Advisory Committee also decided to award its first four scholarships totaling $12,000.00 to four students studying Civil Engineering at City College, Cornell University, Manhattan College and Polytechnic University (now part of NYU).

In comparison, The Moles Scholarship Program has awarded this year alone a total of $259,000 in scholarships to students at 18 participating colleges and universities.

2007

The Moles' Member Award for Outstanding Achievement was conferred on Robert R. "Bob" Buckley at the Annual Awards Dinner on January 31, 2007. Bob's achievements in heavy and highway construction and his stewardship of Buckley & Company are legendary. His leadership of the Contractors Association of Eastern Pennsylvania and the Associated Pennsylvania Contractors has, no doubt, advanced the status and reputation of the heavy construction industry. His service to The Moles as President in 2000 was greatly appreciated and his generosity and service to his alma mater, Drexel University, and the Philadelphia Chapter of the March of Dimes serves as an example to all.

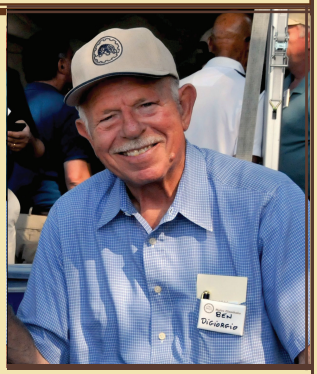
On a related note one of the technical presenters for Bayonne/Goethals Bridge projects at this years' Moles Student Day was a recent Drexel University graduate. During a general conversation about The Moles which occurred at the conclusion of the tour, Bob Buckley's name came up. The young lady said, "Oh I know Mr. Buckley! Well not really, but I played on Buckley Field while on the lacrosse team at Drexel!"

John Eckart along with Joel Moskowitz are contributing editors of the Holing Through. They volunteer their time to research and write about the rich history of the Moles from our Archives files. Additional volunteers are always welcome.

COMMITTEE MEMBERS 2017/2018

AWARD COMMITTEE: Chairman, Gary Almeraris, Paul C. Schmall, Vice Chairman; Joseph Ferrara and Milo E. Riverso, Members-at-Large. **MEMBERSHIP COMMITTEE:** Richard Raab, Chairman; Jesse Ottesen, Vice Chairman; Members: David Benton, Michael Goldstein, Gregory Hill, James Hughes, Michael Mergentime, James Moriarty, Gary Yerganian and Peter Zipf. **PROGRAM COMMITTEE:** Michael McKenna, Chairman; David Puza, Vice Chairman; Members: Andre Ameer, Ben D'Alessandro, Robert Fischer, Patrick Mullen, Paul Pomponio, Vincent Sambrato, Thomas Traylor, Brian Vella and Nancy Vliet Cucco. **FINANCE COMMITTEE:** Alfonso Daloisio, Jr., Chairman; Members: Jack Callahan, James Ferrell, Joseph Malandro, Malcolm McLaren, and John McNamara. **EDUCATION COMMITTEE:** Jack Tobin, Chairman; John O'Keefe, Vice Chairman; Members: Michael Cote, Patricia Darnell, Terrence Flynn, Michael Horodniceanu, Robert Palermo, Brian Reilly and Eugene Sullivan. **PUBLICITY COMMITTEE**: Francis Arland, Chairman; Gaby Antoun, Vice Chairman; Members: Jeffrey Cruz, Lonnie Jacobs, Anthony Mann, Val McWhorter, Alan Paskoff, and Gregory Ziegler.

May They Rest In Peace



Vittorio "Benny" DiGorgio, passed away on May 11, 2017 at 78 years young. After immigrating from Italy in 1956, Benny worked for Ingram & Green and notably worked on the 1964 World's Fair and later was a founding partner of Urban Piling.

Joseph DiMiceli, 90, died on June 26, 2017. Joe spent his career with Slattery (aka Skanska), which became a major force in the building of roads, subways, bridges and tunnels throughout the East Coast. He leaves behind his wife Anne and extended family.

Robert A. Nichols, just 54, died peacefully in his sleep at his home on May 28, 2017. Robert received his BSCE from Bucknell University ('84) where he met his future wife of 28 years, Catherine. He was Senior Vice President of Estimating at Skanska USA.

WINTER MEETING 2018!

Miami Beach, Florida
March 1-4, 2018!

Make way for The Moles when they arrive at the **Eden Roc Resort (Nobu Tower)!** Visit The Moles' website, www.themoles.net for additional information and to make your hotel reservations via a weblink under the Calendar Events tab.

News of Members

In 2014, two members of the UCA Editorial Committee, **David Klug** and **Colin Lawrence** (both Moles Members) decided that we needed to take steps to create a tunnel industry book that would document the accomplishments of our industry predecessors and a four person book committee was formed with a represenative from a tunnel contractor, Mike Roach of Traylor Bros.; a tunnel design firm, Colin Lawrence of Mott MacDonald; David Klug of David R. Klug & Associates, Inc. and a special graphics editor, **Brian Fulcher**, also a Moles Member. Their collaborative efforts, including chapters by industry experts (many of which are Moles Members), is now available! Order your copy through the UCA or SME or at the Clambake, where David will be available in the lobby of the New York Athletic Club.

Martin McDermott, P.G., joined Moretrench as Division Manager of its Geotechnical Group based in the Philadelphia area. Martin brings 30 years of geotechnical construction experience with a specialization in drilled shaft construction. Martin is an active members of several organizations including ADSC, DFI, ASCE and GBCA.

HARD HATS WANTED!

We are creating a "hard hat wall" at The Moles' headquarters! We already have 26 from companies who donated hats to this year's Students Day and appreciate other Mole members forwarding one per affiliated company to complete our display.

New Mobile Version of the Moles Website Now Available Using Any Smart Phone:

You are a few quick, short steps away! Using any Smart Phone please be guided by the following steps:

Step 1: Using your Smart Phone's web browser, log into www.themoles.net and this screen will appear: (*Photo A*)

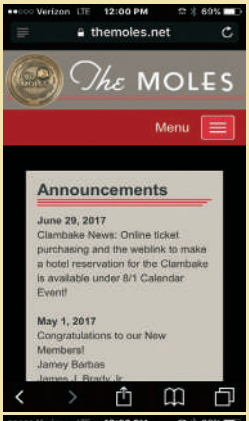


Photo A

Step 2: Tap the Menu button 

located in the upper right corner of the screen and this screen will now appear (*Photo B*):

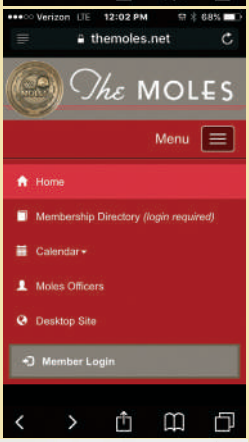
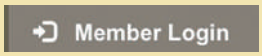


Photo B

Step 3: – Click on Member Login 

and this screen (*Photo C*) will appear:

A. Simply enter your Username (originally set as your Moles 4 digit # unless you changed it previously) and your Password (originally set as "themoles" unless you previously changed it)

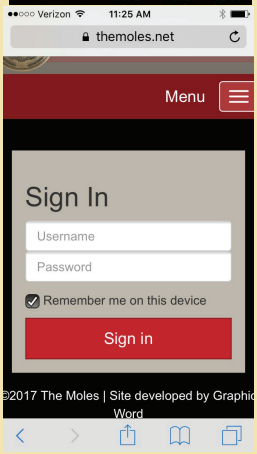
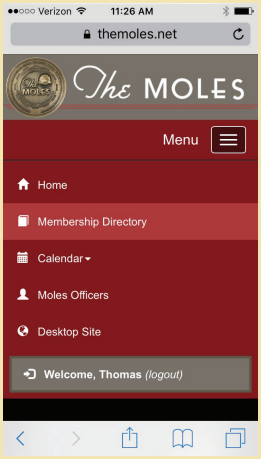


Photo C

B. Then tap Sign in 

and this screen (Photo D) will appear:

Photo D



You are now logged in and your phone will remember your User Name and Password automatically for all future logins!

You now have access to all current Moles information such as Officers, Committee Members, Updated Calendar of Events and Upcoming Committee Meetings with all associated details. Please note that you now have easy, mobile access to our **Membership Directory,** similar to what was previously mailed to you annually. Simply click on Membership Directory and begin typing the first or last name of member until you see the name appear – then simply click on the name and the associated contact information will appear, including a contact phone number for most members.

Give it a try and let us know if you have any issues. Please note that since this mobile feature is tied to our main website please make sure you have logged into our main website either from a desktop computer or a smart phone at least once in order to allow the smart phone feature to operate.

Good Luck **!**