



Treasured Times

Golden Triangle Explorers Society

In Quest of the Past

Volume 22 Number 2

February, 2022

Next Monthly Meeting

SPRING CREEK BBQ
3939 W EMPORIUM CIR
MESQUITE, TEXAS 75080
JAN 14, 2022 TIME 7:30 PM

**REFRESHMENTS FOR
NEXT MEETING:**

As part of our agreement with Spring Creek BBQ, we will not compete with their sale of food or drinks. Please purchase drinks and food before or while we meet. Remember – we are meeting rent free!

Future Monthly Meetings

We have returned to our original schedule of the second Friday of each month. Please arrive early to eat and visit with other members.

CLUB OFFICERS

PRESIDENT:

MARY PENSON

VICE PRESIDENT:

DEAN WALLACE

Treasurer:

TERRY SCHICK

SECRETARY:

JENNIFER KINSEY

MARY'S MESSAGE

by Mary Penson

Congratulations to Golden Triangle members!! We are definitely on our way to becoming a viable Treasure Hunting club again.

Our February meeting will be held at Spring Creek BBQ, address 3939 W Emporium Cir, Mesquite 75150. We will meet for dinner at 6:30 and the meeting will start at 7:30. We will continue to take dues for 2022. \$25 for a family membership and \$20 for single memberships.

We welcome new members Aaron Irvin and Robert Schneider.

During our January meeting our members were asked if one of us could find a larger, centrally located meeting place. We are growing and will need more space.

Our first combined Fun Hunt with East Fork Treasure Hunters on Sunday the 23rd was great fun. Our Hunt Master and Treasurer had great targets in the token hunt. So sorry if you had to miss it.

Please take care and stay safe out there.

See you on Friday, February 11.

From The Vice President

by Dean Wallace

Hello everyone. We had great attendance at our last meeting, almost standing room only. I want to welcome our new members Aaron and Robert. Our guest speaker for February will be author, historian Jim Gatewood. He will reveal many things about the JFK assassination. Our speaker for March will be well

OTHER CONTACTS

HUNT MASTER:

DAVE TOTZKE

REFRESHMENTS CHAIR:

TBD

NEWSLETTER EDITOR:

MIKE SHAW

WEBMISTRESS:

TRACY JOHNSON

SEE YOUR MEMBER DIRECTORY FOR TELEPHONE NUMBERS

MEMBER

ADVERTISEMENTS

This space is reserved for free member ads. Do you have something you wish to sell or buy? Member ads, including pictures, will be printed as space allows.

We also have space for paid ads. If you have a business or service available and wish to advertise to club members (and those who visit our newsletter on the Webpage), reasonable rates apply.

known Texas Relic Hunter James Savage. We also have scheduled Rusty Curry of Garrett Metal Detectors in the future. Let's continue to recruit new members. Happy digging and stay safe.

Minutes of the Last Meeting

by Jennifer Kinsey

Minutes for the January 14, 2022 Meeting

Meeting was called to order at 7:35pm by President Mary Penson. Was held at the Spring Creek BBQ in Mesquite

Visitors were: Robert Schneider, Aaron Irwin, Jennifer Kinsey and Becky Natcher

Larry Voyles has asked to step down as Secretary. Jennifer Kinsey has volunteered to be the Secretary. No other nominations. Jennifer Kinsey is elected by Acclamation.

Our former Treasurer, Francine Broome and our former President, Timothy Scott Givens will be removed from Golden Triangle Explorers Society's account with the Credit Union of Texas.

2022-2023 election of officers:

- President – Mary Penson was elected into office December 10, 2021
- Vice President – Dean Wallace was elected into office December 10, 2021
- Treasurer – Terry Schick was elected into office December 10, 2021
- Secretary – Jennifer Kinsey was elected into office January 14, 2022

Health and well being of members:

Frank Martinez has Covid. Michael Natcher had stents put in his arteries and is doing well enough to be present. Ed Burnett tested positive for Covid but has a symptomatic symptoms. Dave Totzke and Frank Lawson are out of town.

Sympathy card for Carol Ann Cooley.

Speaker is Dean Wallace

Dean read "What Being A Treasure Hunter Taught Me" by Vikki Merritt. Thank you Dean!

Next month speaker is James Savage.

Fun Hunt will be held on January 23 at 2:00pm at Casa Linda Park in Dallas

Treasurer report was read from last known, Feb 14, 2020.

Tracy Johnson has agreed be in charge of the website. She has already redone much of it. Currently working on uploading past newsletters and directions. Officer page is already corrected. In addition, all the links are already working. Thank you Tracy!!

January Birthdays- Terry Schick
Name tag drawing – Aaron Irwin

Location for a larger meeting room was requested. Everyone will come up with ideas as the past location is asking \$300.00 a month.

Meeting adjourned

DOOR PRIZE WINNERS

Door Prizes	
Prize	Winner
Ed. Note: Sorry, I missed the prizes.	Tracy Johnson
	Aaron Irwin
	Terry Schick
	Bill Abbott
	Robert Schneider

FUNDRAISER DRAWING WINNERS

Fundraiser	
Prize	Winner
1987 Proof Set	Bill Abbott
White House 200 th Anniversary Coin	Bill Abbott
2018 Silver Dollar	Mike Shaw
2018 Silver Dollar	Harold Ross
1884 Silver Dollar	Terry Schick
1912 Silver Quarter	Bill Abbott
1857 Flying Eagle Cent	Mike Shaw
1833 Large Cent	Becky Natcher

Huntmaster's Report

by Dave Totzke

Ed. Note: I received a report on the fun hunt but lost it during e-mail problems. But I found the link to online photos.

Here is the link to the pics we took at the GTES/EFTHA Fun Hunt at Casa Linda park. It was lots of fun!

<https://photos.app.goo.gl/JDVyobZtUxNZPBiN6>

Steve D
EFTHA Secretary

MEMBER NEWS

This space will be used for member submissions of news concerning their finds and activities. Perhaps even a few family items or recipes?

FINDS OF THE MONTH CONTEST

Place	Winner	Item
COINS		
1 st	Dean Wallace	1943 Walking Liberty Half dollar
2 nd	Terry Schick	1963 50 cents
3 rd	Harold Rosee	1943 Washington half
JEWELRY		
1 st	Terry Schick	14K ring
2 nd	Harold Rosee	silver pendant
3 rd	Chuck Howell	14K white gold necklace
RELICS		
1 st	Chuck Howell	1906 Kellogg's Toasted Corn Flakes FOB
2 nd	Tracy Johnson	Brass Cow tag
3 rd	Dean Wallace	Cotton Mill Token
MOST UNUSUAL		
1 st	Dean Wallace	Scary Face
2 nd	Tracy Johnson	Whiskey Barrell Spigot
3 rd	Michael Natcher	Augey
SECOND CHANCE		
1 st	Terry Schick	Silver Ring
2 nd	Harold Rosee	Pinky Ring
3 rd	Chuck Howell	1930's Sedlite key FOB

An Interesting Article from One of Our Members

Archaeology and XRF

[Richard Freeland](#)

September 30, 2021



Looking into the Past with “Elemental Vision”

King Solomon’s secrets may be hidden in a shard of copper slag.

How, you may ask, would we know anything about a biblical King from a blacksmith’s slag—his metallurgical waste pile?

Going deeper than you or I might, down into the slag’s elemental composition, archaeologists have discovered evidence in the last decade that King Solomon may have had smiths skilled enough to build the Kingdom of Judah described in the Bible. A baptismal basin that stood on twelve bronze bulls. A hall of cedar. A magnificent ivory throne. Who knows what could have been possible?

A vision of history illuminated by a simple tool: the XRF gun.

Meet the XRF Gun: An Archaeologist’s Storytelling Device

X-ray fluorescence (XRF) is a non-destructive measurement technique in which one fires x-rays at a sample with an XRF analyzer, a tool commonly known as an XRF gun. The sample responds by emitting x-ray fluorescence, with each element giving off its own ‘fluorescent fingerprint.’ The XRF gun then reads the fingerprints and gives the user a detailed profile of the sample’s elemental composition. All of this happens in as few as 1-2 seconds—pretty good for laboratory-grade analysis.

Archaeologists use the “elemental vision” of XRF to discover historical secrets. The test method is simple: fire x-rays, study the chemical makeup, and consider what your findings reveal given the historical context.

King Solomon’s secrets may not be so easy to discover, but expeditions to southern Jordan in the last decade by a joint team of archaeologists from Jordan and the University of California, San Diego (UCSD) have revealed that copper smelting in the neighboring kingdom of Edom, Judah’s bitter rival, progressed to an industrial level.

Edomites lived in the highlands, according to sources dating back to the Book of Jeremiah. “Though you make your nests as high as eagles, I will bring you down from there,” the author wrote. But according to the ELRAP team’s findings, the people of Edom would swoop down into the dry river valleys below to mine precious copper.

Khirbat en-Nahas, or “ruins of copper,” was the first site the archaeologist team excavated. What they unearthed was astonishing: a fortress formidable enough to rival those in Israel, Jordan, and Sinai, guarding 13 previously undiscovered copper mines, littered with more than 350 ancient mining tools.

According to Dr. Thomas E. Levy and Dr. Mohammad Najjar, co-directors of several expeditions and founders of the Edom Lowlands Regional Archaeology Project (ELRAP), copper smelting in Edom achieved a level of artisanry and a scale of operations large enough to make a biblical version of King's Solomon's kingdom viable.

"We have discovered a degree of social complexity in the land of Edom that demonstrates the weak reed on the basis of which a number of scholars have scoffed at the idea of a state or complex chiefdom in Edom at this early period—and, by extension, a state in Judah," Najjar and Levy wrote in their article "Edom and Copper" in *Biblical Archaeology Review Magazine*, 2006¹.

How could Judah have survived centuries of war with Edom without achieving a mastery of copper smelting to rival their neighbors? Wouldn't Judah have to be "a kingdom with ambition and the means of fighting off the Edomites," as the archaeologists described it to *The New York Times*² in 2006? Or so the theory goes.

"Edom and Copper" sparked its own war upon publication, with archaeologists battling it out quite civilly in papers and lecture halls, at least in comparison to bronze age warfare, but with no less fierceness and passion.

"One 'fortress' does not make a Kingdom," Eveline van der Steen, East Carolina University, and Piotr Bienkowski, University of Manchester, told *The New York Times*.

Another vision of 10th century Judah exists, one in which ancient Jews were more of a pastoral people. King Solomon? A chieftain, perhaps, rather than a king. Once, this view was blasphemous to biblical history. Then, thanks to contemporary archaeology, it became a compelling theory. Now, this "low chronology" view of Edom and Judah grapples with groundbreaking evidence expeditions have been gathering for the last 15 years, findings that indicate Levy and Najjar may be on to something.

Israel Finkelstein of Tel Aviv University, an advocate of the low-chronology movement, voiced his dissent as well, telling *The New York Times* that Levy & Najjar's initial research did "not shed new light on the question of state formation in Edom."

Was the King Solomon of the Bible a myth? Or, for once in contemporary archaeology, is the religious text more accurate than we know? To answer that question, we must journey to Faynan, Jordan, one of many historical sites across the world given new life by x-ray fluorescence.

Discovering King Solomon's Mines—Or Rather, His Neighbors' Copper Slag

Jordan is a part of what is known as the Levant. The term "levant" means rising in French, inherited from the Italian *levante*, which conjures up images of the rising sun in the East. In German, the term is translated as "morgenland," or morning land. Levant is the name given to a cultural region that encompasses parts of modern Lebanon, Syria, Iraq, Palestine, and Jordan, defying geopolitical boundaries. Western religion dawned here. Depending on who you ask, Moses parted the Red Sea, Jesus thirsted for wine at a wedding, and Mohammed took one last look at Jerusalem before he ascended to the heavens, all on Levantine soil.

Archaeology in the Levant began as treasure hunting. Now it's evolved into an endless quest for the historical treasures buried in the deserts and dry steppes where biblical kingdoms once flourished.

Here, archaeologists search for ceramics, which serve as veritable codices of historical data, as well as mud-brick homes and ruins of lost cities. And, as always, King Solomon's mines, the legendary gold mines belonging to Solomon himself that writer H. Rider Haggard fantasized about.

However, the team of San Diegan and Jordanian archaeologists set out in 2014 to learn about the past from a different source of historical evidence: copper slag.

Forgoing the search for lost cities themselves, the ELRAP team instead returned to the copper beds of Faynan in southern Jordan, where smiths, as they do, left their slag. Copper slag is mounds of metallic waste, a by-product of copper extraction by smelting. Impurities are cast away into what becomes small mountains of discarded metals. You may be thinking, "How can a monumental discovery have been found here, in a metallic mound? These aren't exactly Solomon's Mines," and you'd be right. But buried in the elemental composition of these humble mountains are gems of historical insight that rival the riches Haggard dreamed up over a century ago.

Brady Liss, an archaeologist from the UCSD Levantine and Cyber-Archaeology lab, was part of this expedition. He writes about the power of XRF's "elemental vision," as he calls it in his 2016 article: "Using X-Ray Fluorescence to Examine Ancient Extractive Metallurgy Practices: A Case Study from Iron Age Khirbat al-Jariya, Jordan."³

A newer dig site, Khirbat al-Jariya, was his destination: once a copper ore district in Faynan around the 12 – 10th centuries BCE, the site may have forged copper for the biblical kingdom of Edom, similar to Khirbat en-Nahas. Now, it's home to 15,000 – 20,000 tons of slag. Khirbat al-Jariya is ideal for archaeometallurgy thanks to its “large copper smelting centers supported by networks of smaller, ephemeral mining camps.” Copper mines they may be, but to archaeologists, they are veritable gold mines of history, especially because Khirbat al-Jariya has been “primarily undisturbed since its Iron Age abandonment, leaving a relatively pristine record for archaeological research.”

Liss and his team used GIS, carbon dating, and lidar to study the smelting sites, but the key tool to their findings was XRF. Specifically, the Bruker TRACeR III-V+, a portable XRF gun.

“XRF has become a regular practice in investigating metallurgical remains and artifacts... both in the field and in the lab,” Liss writes.

How Archaeologists Harness the Power of XRF

How, then, do you make historical discoveries with XRF? Well, it's quite simple really. Point and shoot. A piece of slag gives us an epic poem beginning in sparks, with the first copper smelted at the site, and ending in empires, or in this case small kingdoms like Judah.

Let's take a look at how the ELRAP team made their discoveries.

First, they excavated a 1 x 1-meter rod of slag from one of the mounds, taking samples both from specific parts of the rod and from surrounding mounds. Digging down to the bedrock, the team retrieved enough slag to give them samples from every phase of copper smelting throughout the site's history.

An XRF analyzer only fires at a single point and may miss key discoveries if the sample is not homogenous. For example, fire one at a rock and it will measure the stone effectively but may miss a vein of gold that runs through the other side. To capture stray copper shards in the “inherently heterogeneous” ancient slag, the team crushed each sample into a fine powder, grinding them with a mortar and pestle until they were representative of that piece of slag's elemental makeup. Specifically, they were looking for how much copper each sample had, which would serve as an indicator of how successful copper smelting processes were at the time.

Once powdered, the copper slag sample was analyzed with the Bruker TRACeR III-V, which has “a rhodium anode to produce x-rays, and a Si-Pin detector for collecting fluorescence from the targeted sample.” The x-ray beam is 3 x 4 millimeters. Users can “control voltage (up to 40 kV) and current (between 0 – 60 μ A) to enhance the detection of desired elements... the XRF system can be tailored to target specific elements of interest, maximizing their detection.”

Here are the test specifications the team used:

- Heavy elements: 40 kV, 13 μ A, with an acquisition time of 300 seconds
- Lighter elements: 15 kV, 35 μ A, with blue Titanium filter and a 300 second acquisition time

Once the testing was complete, they analyzed the results on a computer and found something remarkable: the smiths were getting better. Marked improvement in their copper smelting practices was evident.

A smith who has mastered the art of copper smelting will extract much more of the stuff in the process than a beginner. And their slag, their metallurgical waste, if you remember, will have much less precious copper. Looking at all the samples from throughout Khirbat al-Jariya, the archaeologists found a 70% decrease in copper waste in the slag over time.

Now, it is important to note that the team's findings do not definitively prove anything about Edom, Judah, or King Solomon, nor does Brady Liss make any such claims, beyond opening the doors to a palace of possibilities for metallurgically sophisticated Levantine societies in the 12th – 10th centuries BCE.

What we do know, though, is that XRF made the difference in this interpretation of historical truths. Only two phases of copper production were found, but XRF analysis revealed that there was a dramatic difference in how successful they were, hinting at an evolution of coppersmithing practices.

A small story to tell. But it may be the beginning of recreating the world in which King Solomon and his Edomite rivals lived, one piece of copper smith's slag at a time. And that is the power of XRF.

Illuminating the Past with the Technology of the Future

Let us revisit our biblical mystery for a moment. We set out to discover who King Solomon was—a king? A myth? A Bedouin sheikh? Or something else.

“Only a complex society such as a paramount chiefdom or primitive kingdom would have the organizational know-how to produce copper metal on such an industrial scale,” Drs. Levy and Najjar told *The New York Times* in 2006.

To Levy and Najjar, “the biblical references to the Edomites, especially their conflicts with David and subsequent Judahite kings, garner a new plausibility.”

Since they spoke out in 2006, their international team of archaeologists has continued to research and write passionately on the subject, publishing additional findings in 2010, 2012, 2014, 2016, 2020, and beyond, that all build the case for a reinterpretation of the minimalist, low-chronology vision for the Levant of biblical times. Recently, Erez Ben-Yosef, an ELRAP team member, discovered fresh evidence of Iron-Age Edomite sophistication in the nearby Timna valley, a revelation in harmony with Levy and Najjar’s Faynan findings. “The scale of production tells us that there was something bigger than a few tribes here,” Ben-Yousef told *The New Yorker*.⁴

But not everyone is convinced.

“Is this early Edom?... Why not Midian; Amalek, Kedar, Paran, Teman?” low-chronology scholar Finkelstein wrote in a reply to Ben-Yosef’s work in 2020,⁵ once again casting shadows on the team’s discoveries.

We have no answers. All we have are the strikes of the smiths’ hammers. Each time, more accurate. Each age, more copper preserved. And in the days of King Solomon, perhaps just enough to armor the kingdoms of biblical legend.

“Archaeology is paradoxically rooted in the past but dependent on the future,” Brady Liss writes, the future being technologies like XRF that make these discoveries possible.

We live in an age where people want to reconnect with their origins—we trace our family trees on Ancestry.com, map out our lineages with 23 and Me, and cultivate long-lost cultural identities.

X-ray fluorescence and the technologies of the future can, as Liss so presciently wrote, connect us to that past, to our ancestors and our people.

To our stories—and everyone, from smiths toiling in desert mining camps under the night sky, to Kings asleep in their beds, is connected.

We just have to look closer, ask the right questions, and the artifacts will answer—the truth written in their very elements.

To explore the Faynan dig site, its history, and the team’s findings in a stunning interactive digital experience, [visit the UCSD team’s website](#).

Richard Freeland is a San Diego writer most recently fascinated by how archaeologists use new technologies as storytelling tools—breathing new life into ancient civilizations. Freeland works as the Marketing Team Lead for Advanced Test Equipment Corp. (ATEC).