ARCE
AMERICAN RESEARCH
CENTER IN EGYPT

Lecture Transcript:

The Tomb Chapel of Menna (TT69): The Art, Culture and Science of Painting in an Egyptian Tomb
by Melinda Hartwig
Wednesday, July 15, 2020

Louise Bertini:
Hello, everyone, and good afternoon or good evening, depending on where you are joining us today, and welcome to our July monthly lecture with Dr. Melinda Hartwig who is going to talk to us about "The Tomb Chapel of Menna (TT 69): The Art, Culture and Science of Painting in an Egyptian Tomb." I'm Dr. Louise Bertini, and I'm the Executive Director of the American Research Center in Egypt. For those of you who are new to ARCE, we are a private nonprofit organization whose mission is to support research on all aspects of Egyptian history, culture and foster a broader knowledge about Egypt among the general public as well as support Egyptain-American cultural ties. As a nonprofit, we rely on our ARCE members to support this work, so I want to first give a special welcome to our members who are joining us today, and if you're not already a member and are interested in joining, I invite you to visit our website, arce.org, to join and learn more. We provide a suite of benefits to our members, including our private member-only lecture series, and our next member-only lecture will be on August 30th with Dr. Solange Ashby of American University titled "The Goddess Isis and the Kingdom of Meroe," and we will be sharing our full member-only lecture series calendar shortly. Our next public lecture will be on August 19th with Dr. May al-Ibrashy of the Megawra Built Collective, and she will talk about recent findings from Megawra's Athar Lina Conservation Program in Historic Cairo. ARCE has also recently launched a brand-new podcast just this past week with our first episode focused on the lineage of Tutankhamun, and new episodes will be available every 2 weeks, both on our website, arce.org, as well as on SoundCloud. So with that, I am now going to turn it over to the reason why you are all here today. I'm very pleased to introduce Dr. Melinda Hartwig who is a specialist in Ancient Egyptian art history, ancient Near Eastern interconnections and the applications of science and art. Her expertise is recognized internationally, and she has published many, many books and articles. Her latest book, "A Companion to Ancient Egyptian Art," published by Oxford Press in 2014, received the 2016

Prose Award. She is curator of Ancient Egyptian, Nubian, Near Eastern art at the Michael C. Carlos Museum at Emory University and is also professor emerita at Georgia State University where she taught Ancient Art History. She holds a PhD in Egyptian and Near Eastern Art and Archeology from the Institute of Fine Arts at New York University. Melinda has worked for more than 30 years in Egypt, but you would never know that, directing Theban Tomb projects, both large and small, and is a recipient of both NEH and USA grants, among others. She has curated several national exhibitions about Ancient Egyptian art and culture and has received numerous awards and honors to further her work. She is also the past president of ARCE and is a frequent on-air expert for National Geographic Channel, Science Channel, Smithsonian, PBS and BBC. She is currently completing a 24-part series for the Great Courses entitled "The Great Tours: A Guided Tour of Ancient Egypt" that will focus on the art and architecture of the Nile Valley. So I'm now going to turn it over to her, and as a reminder, if you have any questions throughout the lecture or at the end to please enter them in the Q and A button. So with that, I am turning it over to Dr. Hartwig. Thank you.

Melinda Hartwig:
Thank you, Louise, for that wonderful introduction. So let's get started here. Whoops. Small difficulty here, just ... There we go. Okay. That's what we want. Okay. Okay. Good. So first of all, thank you all for being here.

Louise Bertini:
Your desktop. We see your desktop, not the PowerPoint. There you go. Now you're good.

Melinda Hartwig:
Yeah. There we go. There we go. Yeah, I had to get into it another way. First of all, thank you all for joining us today. It's a distinct pleasure to be able to talk to you about a project that I worked on from 2007 to 2009, and so let me just get started by saying that the Tomb of Menna, it's Theban Tomb 69, is tucked into the hill of a burial site popularly known as the Tombs of the Nobles, the ancient city of Thebes, now modern-day Luxor. It's named after a shrine belonging to a local saint that sits at the top of the hill Sheikh Abd el-Qurna, or Qurna for short. It was the final resting place for many elite officials who served the kings of Ancient Egypt from the old, well, up to the late period. Among these burials, the Tomb of Menna is one of the best known due to the superb quality of the paintings that decorate the

tomb chapel, and these paintings, among the finest ever created in Ancient Egypt, reflect the elevated status of the tomb owner, Menna, as well as the creativity and the skill of the ancient painters. This talk will present an in-depth look at the Tomb of Menna to coincide with the virtual model that was launched by ARCE in April 2020. From 2007 to 2009, an international group of conservators, Egyptologists, scientists and digital specialists brought the tomb chapel of Menna back to its former glory using cutting-edge noninvasive methods. This talk will focus on the results which relay important information about the tomb owner and the time in which he lived as well as the artistic methods and the status materials of the ancient world. The project was directed by me and administered by the American Research Center in Egypt as part of its Egyptian Antiquities Conservation Project. The project was funded by a grant from the United States Agency for International Development, sponsored by Georgia State University, where I previously worked, and carried out in collaboration with Egypt's Supreme Council of Antiquities and a number of European partners, including the Center for European Archaeometry at the University of Liege, University of Ghent and the Center for Research and Restoration of the Museums of France. The resulting book from this project called "The Tomb Chapel of Menna: The Art Culture and Science of Painting in and Ancient Egyptian Tomb," published by American University in Cairo Press is about to undergo its second printing, so ... The Tomb of Menna here, as you can see, is on the west bank of Luxor on the Noble's Necropolis, Sheikh Abd el-Qurna, and we're looking right now here at the forecourt, the sunken forecourt of Menna, and then you can see exactly where the tomb is located on a map of Egypt and then map of the west bank. The tomb is a T-shaped plan with a forecourt here leading into a broad hall and into a inner hall. Now, only the superstructure, or the chapel, was decorated. The burial is belowground. It was excavated early in the 20th century and was not part of the project, the Tomb of Menna Project. Menna's titles are really, in this tomb, this is the only thing we really know about Menna. He was a scribe and a bureaucrat in charge of surveying the grain fields and taxing them for the king and the temple of Amun-Ra. In short, a tax collector, a not-unimportant position in the ancient dynasty. The administration of both state and temple fields at the same time by one person, Menna, because overseer of the Fields of Amun, overseer of the Fields of the Lords of Two Land is unusual. We know from a later papyrus, the Wilbour Papyrus, how temple-owned lands were a special form of state property owned by the pharaoh. Different offices of great administration were centralized under Menna, perhaps for greater efficiency. There also is reason to believe that this was efficient for the express purpose of payment

for Amenhotep III's grand building plan, but I'll get to that in a second. His tomb traditionally has been dated to the reign of Thutmose IV, but there's solid evidence that it was completed after year 30 of Amenhotep III. Now, in literally every scene, you can see Menna wearing the shebyu collar, also known as the Gold of Honor. The Gold of Honor indicated that Menna received recognition from the king himself and occupied a high office that directly related to the king and his royal holdings. Now, over here on the right, you can see a line drawing from the tomb of Khaemopet, who was an overseer of granaries during the reign of Amenhotep III. He also has just received the Gold of Honor, and the text that is part of that drawing says clearly that the controllers of the king's estates were awarded after an exceptionally good year of harvest that coincided with one of the king's Sed festivals in years 30, 34 or 37. So I assert that Menna was one of those estate stewards who received the Gold of Honor from the king after a year in which the harvest was particularly good, and if you received the award in the same year as Khaemopet, this would place Menna's career into the reign of Amenhotep III, past the rulers for Sed festival in year 30. Now, there are other indicators that point to the tomb being constructed during the reign of Amenhotep III and also Menna's career being in the reign of that king. To the right, you can see a statue ... Actually, not to the right, to the left, you can see a statue bust of Henuttawy, who was the wife of Menna, now in the Cairo museum. It is one half of a pair statue that resided in the niche at the back of the inner hall of Theban Tomb 69. It's sculpted in a style that clearly belongs to the reign of Amenhotep III. Architecturally, the layout of the court and the tomb is towards the southwest. Now, it may have been designed as such to take into account the existing court of the Tomb of Meryptah here, Theban Tomb 68 that dates to the reign of Amenhotep the III after his year 30. There are other indicators such as Menna's sunken forecourt and stylistic textual and iconographic similarities of the tomb of Menna with other tombs in Sheikh Abd el-Qurna from the reign of Amenhotep III. So for that reason, we suggest that it's manufacture date was during the reign of that king. We can also assume that Menna probably began his career during the reign of Thutmose IV as a scribe and climbed through the ranks to become one of the granary officials during the reign of his successor, Amenhotep III. Now, we can make up Menna's family from information within the tomb. We've already met Henuttawy here, Menna's wife. She was a musician of Amun, and she figures very prominently in the tomb. Menna also had two sons, one named Se and the other one named Kha. Se followed his father into the administration of temple fields as a scribe of counting grain of Amun, and Kha was a wab priest. He also had three daughters, one,

Amenemweskhet here and Nehemet, who were ladies in waiting at the Pharaoh's court. Kasy, who's not pictured here, was the youngest. There are also two daughters-in-law named Way and Nefery. Now, what's interesting here is that Henuttawy's father could be Amenhotep-sa-se, who was the second high prophet of Amun. His son, or the son of Menna Se, is named after his grandfather and also the close connection of Menna and the family to court has direct bearing on Amenhotep-sa-se's wife, Roy, who was a lady in waiting and a chantress of Amun. She passed the lady in waiting on to her granddaughters. So the project, Tomb of Menna Project, was completed in four phases, photographic survey and digital line drawings, conservation, archaeometry, painting process, texts and iconography, and I'm going to start with the high definition photography here. Now, a process was developed to create an exact copy of the tomb for documentation and digital epigraphy purposes. The goal was to produce stitched images that related exactly to one plane. The use of high-definition photography in flat, color calibrated and rectified, also captured as much detail as possible as you can see from this Hathor head on the cistern of Henuttawy. The results allowed us to have high-resolution images, geometrically controlled, projected onto a uniform plane and referenced in a local grid. Once stitched, we produced a set of detailed A3 prints, and this was used for conservators to map areas of damage, archaeometrists to map the calibration point and art historians to study work process and style. Now, what we've got here are the digital line drawings. They were traced as vector drawings using a Wacom Cintiq and Adobe Illustrator to create line drawings and a one-to-one copy of the tomb chapel. Besides flat light, on the left, other types of light were used to photograph the images. In the middle, we've got raking light, which is brilliant for capturing brushstroke, the impasto of the pigment and any working of the plaster, such as Menna's hair, which you can see has been sculpted in the plaster. UV, on the far right, is especially useful for detecting the presence of certain organic varnishes, binders and changes in the decoration. We also did macroscopic examination through photography, as you can see at the bottom right. Now, I'm going to show you one way that UV photography is such a wonderful way, and very inexpensive way, to look at some details that perhaps are not visible to the open eye. In this case, this is an image of Menna, and he has his arms raised in praise, although you can't see off to the right-hand side, that was the figure of Osiris. But under UV light, you can see the pentimenti. You can see what was changed. Initially, his arm was further to the right, but was then covered over by a layer of gypsum, and now you can see a little bit better, but you can see it even better when why look at in UV. UV is also great for looking at particular coatings,

in this case we're pretty sure you're looking at ... we're pretty sure this is beeswax that was applied to the wigs and hands and also the jewelry of Henuttawy and Menna. Now, the localization and consistent application of beeswax for certain details suggests it was applied by ancient artists rather than modern-day conservators. Now we move on to archaeometry, and archaeometry was brought in to enhance the research, to obtain scientific and objective data on materials and techniques, and as you can see, these were the research aims: to identify and characterize the pictorial materials, to provide objective color measurements, to understand the transformation of materials and to describe painting techniques and artistic work process. The results help conservators locate restorations and decide on strategies, and this data also elucidated artistic work process. It's rather technical, but I figured I'd put it up here for you anyway. There were basically the spectroscopic techniques that we used were energy- dispersive X-ray fluorescents and visible and UV spectroscopy, or basically working with UV and visible light, and also RAMAN spectroscopy. Now, these techniques were used together to explore the properties of inorganic and organic matter in situ, noninvasively. So the plus of XRF, or EDXRF, it gives the fast, accurate readings. You can distinguish key elements. It gives a global composition of the pictorial layer, but the problems are, it can't distinguish pigment mixtures with the same key elements, for example arsenic and sulfur for realgar and orpiment. It also can't detect elements below atomic number 16. RAMAN spectroscopy is time-consuming and needs exact point placement, and it was brought in to confirm and complete the EDXRF results, to identify the painting layers and pigments and to identify the organic compounds. No data could be acquired if overwhelmed by surface fluorescents, like Paraloid B72, which is soluble and acetone and has been used over the years by conservation to consolidate wall paintings. And last but not least, UV and visible light records objective color data measurements on the surface layer. We used CIELAB. And here are the results. By taking these technologies together, it was possible to identify the pictorial materials used in the wall paintings. We have gypsum. You have carbon black. You have also dark Egyptian blue or dark Egyptian green serving as black, gray, light Egyptian blue with calcite or carbon black with calcite. Calcite white is what I'm referring to. We only could identify huntite in one zone. It was identified by RAMAN because magnesium is a very, very light element that can't be picked up by XRF. The usual Egyptian green, Egyptian blue, and what I found to be particularly interesting is the mixtures of, say for example realgar and orpiment with iron oxides to stretch out, perhaps, this expensive pigment, maybe used in another way to bring a more brightening effect

to what was being painted. We have arsenic yellow, orpiment, and then we kind of move on down, and brown is basically everything thrown into the pot, just a mixture of all kinds of pigments. Now, let me just say that on the outset there were problems with our spectroscopic survey. RAMAN was completely overwhelmed by the fluorescence of B72, so it was hard to get exact readings. We did get exact readings, but it moved very, very slow. Also the sulfur signature was poor because it's right at the bottom of the XRF detection range, and as I mentioned before, we could only find huntite in one place. And let me say at the outset here that, although we found it in one place, we could be pretty sure that a lot of it was used within the Tomb of Menna. So what do these pigments look like? Okay. We've got iron oxides, yellow, red and brown. These are found in the waddies of the Theban Necropolis, particularly behind the hill of Sheikh Abd el-Qurna is a place that has come to be known as the Valley of Colors. Black, carbon-based from the firing of organic material, such as burnt wood or lamp black from the soot of burning oil lamps. Also calcite white. Widespread in nature. Derives from limestone or chalk. While the ancient source of huntite is ... It's not really known. There's some guesses where it was in Egypt, but today huntite can be found, and it's fairly widespread in the eastern and western deserts of Egypt. The other materials, such as orpiment yellow and realgar red were acquired through extensive trade networks from countries bordering the Red Sea, Arabia, East Africa as well as India and Sri Lanka. Now, with the orpiment yellow, it was used in particular in Egypt as a substitute for gold to bring out the brightness of the mineral, the same case as realgar red, and because of the extensive trade networks, we're pretty sure that orpiment and realgar were what we call status pigments. We also know that these are arsenic sulphides and pretty toxic. They were cut with ocher, perhaps to mitigate their dangerous qualities, but certainly to add to the brightness of the hue. And not to forget the blues and greens, registered as cuprorivaite and parawollastonite, respectively. Both are glassy pigments created by heating silica, copper, copper oil, lime and alkali and contained coarse particles to achieve a suitable saturation of color. Now, the binders ... We had a binder problem. They're very, very hard to detect with noninvasive analysis. We did, in fact, confirm that there was gum arabic, and that was confirmed by RAMAN, and in the laboratory, we found that animal glue was also most likely used in the tomb, and as I also mentioned beeswax. Now, I'm just going to show some of the ways that we can work with ... some ways that archaeometry and spectroscopy can help us understand work process, dating of tomb phases and even artists, their particular, I guess you could say, signature. So looking at these tomb ... This is what we're

looking here is the Valley Festival Wall. It is the ... It's a broad hall on your right. It's right adjacent to the entrance to the tomb. The text, you can see in blue here, was preserved from the first conception of the tomb. The band indicates that there was an early, this band here, indicates there was an earlier doorway that was filled and plastered up at the same time as the wall was plastered and repainted. This led people to question whether Menna usurped the tomb from an earlier occupant. Now, plaster and pigments were tested to see if any similarities existed between the materials used on the first layer, this is the first layer right here, and this is the second layer, plastered over the first layer. The pigment mixtures contained the same mix and concentration, which confirms the tomb was not usurped and that, in fact, this is just a change of plan that happened during the lifetime of Menna. So the artist began painting the wall with the Valley Festival scenes of offering here. You'll see this a little bit clearer in a further slide. So it began there, and for some reason they didn't keep the original doorway. Instead they filled it in, the old door, plastered over everything and painted offering bearers on top. They moved this scene all the way over, lock, stock and barrel, to the new doorway. So this is the new doorway here. This was the old doorway here. This is the plaster decoration over it. In other words, the artists didn't change the original texts or the scenes, but simply moved them to the right to coincide with the new door, and here this shadow here, you can see this is what was underneath and plastered over, which is nearly identical to what we have over further to the right. So the question is why? Why did they go through this trouble? Now, it could have been to avoid, to have to cut through a layer of hard to cut flint nodules, and you certainly have them along this wall. It could also have been that Menna's fortune was growing and he wanted a bigger tomb. It also could be that the sculptors who were excavating the tomb, and the painters, wanted to avoid an existing burial to the west of the tomb, and I just put a question mark there because I don't know. Now we're going to go into conservation. I had an absolutely brilliant team from Egypt, Italy and UK, all headed by Bianca Madden, and they followed a particular procedure in order to bring the tomb back to its former glory. Remember when I talked about the photographs that had been taken and were going to be used, broken down to A3 photocopies so that they could be used by the conservators, and in this case, these were the condition surveys that were done at the wall. Now, once that was done, it was entered digitally so that there would be a continual record to be used by anybody to know what the condition of the wall was, and let me just point out a few key points here. By and large the biggest thing that you see on this wall is B72, and that of course is the acrylic polymer. It is used to stabilize the painting, and

also it puts a sheen over the decoration. The other problem with it is that it creates a thin film that doesn't allow the wall to breathe, and it binds dirt so that it has to be cleaned off the wall in order to bring the decoration back to what it looked like in antiquity. Other thing I want to point out, water damage here. This actually is a urine drip from the stable. No, it wasn't a stable. It was more like a yard for the farm animals for the house that was once right above the tomb, and now of course we all know those houses have been moved for the protection of the antiquities. And there you go. There Paraloid B72. You can see it at this really angled photo. It looks like it has just been slabbed on with a brush, almost like a big painter's brush. In order to take care of it, we ended up having to literally spend most of our time using acetone to take down the B72 in order to let the wall breathe and to get the dirt off of the colors. Now, archaeometry was used to check the color measurements, and by this, they were undertaken before and after the cleaning. The spectra were taken in October, 2007, and then the last one was taken in November, 2008 after the cleaning procedures done by the conservators. And as you can see here, the spectra are the same except the lightness varies. The lightness varies because of the result of the dust particles being taken off of the painting. We have the before and after here over the shrine, the statue shrine at the very, very far end of the long hall. So this gray here was modern retouching of the shrine, and so the conservators did the repairs using acqua sporca over the modern gray retouching, and these are just a few examples of how spectroscopy and digital documentation helped the conservators target and confirm their conservation strategy. Now we're going to go into visual analysis, good old art historical visual analysis. This played a central role in the examination of the painting, and let me just say now that artists were largely anonymous in Ancient Egypt. Signatures were rarely left, so the materiality of the painting was examined to elucidate the work process and artistic techniques. Now, the paintings were examined according to their stratigraphy from the initial plaster layers, backgrounds, grids and preliminary drawings to the succession of colors, transparencies, final outlines and corrections as well as varnishes and coatings. This data was also used to help the archaeometrists select their points for deeper exploration in the tomb. So let's take a look at what the painting ground was. The painting ground is composed of mud plaster and hacked straw, a grainy gypsum plaster and a fine layer of gypsum plaster known as the intonaco. Over here you can see that there were ... This is a case where we have an intersection between walls, and this tells us about the completion of the walls because this yellow band here is supposed to denote the end of one wall and the beginning of the other, but note that this one is yellow. So

it has retained its color, whereas this one is very, very light, and the reason behind that is because this wall was already dry by the time that they ended up making this a yellow line this wall was still wet. Grids and grid lines. Menna and Henuttawy are always in a 14-square grid from feet to hairline, the seated figures. That's standard for many phases of Ancient Egypt. They had a separate grid for the offering table, which is kind of unusual, a separate one for their son here Kha, who is standing before Menna and Henuttawy. And the register below had one grid with which to draw Menna and Henuttawy again, 14 squares from the base of the feet to the hairline, and then, over here, you have another grid used for another seated couple, again, 14-square grid, and I want you to note something here that I thought was really interesting in the tomb, and that is that the figure of Henuttawy is always at the same height as her husband. That is not usual in Ancient Egypt painting. The wife is usually represented as smaller. Preliminary outlines. Okay. This is the figure of a woman. You can see this is the preliminary outline below here, and this is the final outline that was done over it. The preliminary outline just kind of spilled out, and somehow the guy with the Wite-Out didn't come along to fix or tidy this up. There also was something called a reserve technique, which means that there were areas of the painting that were reserved for later color, and then there were others that were covered over with background wash. This white background I just want to show under a microscope shows a slightly bluish gray, and it was very thin with fine granules visible. Then we get into succession of colors. This is a very simple succession mixture. This is a very complicated series of mixtures, and these are both images of Henuttawy. We also have transparency. The transparency of the clothing is indicated by pink here with the men and, in this case, an additional application of white or whitewash. And Henuttawy here, this is her absolutely finest dress. You can see that it's very light, light linen because you can see her body underneath. Henuttawy is sort of a brown over a strong white or a beige-deluded substance of whitewash. Some people always ask me how many artists were there detected in the tomb? And using these methods, we can figure that out. For example, let's look at painter number one. Painter number one is characterized by an outline that stops before the rounding of the nose and a dot at the corner of the mouth, seen here in the figure of Henuttawy. This is from the false door stele right down here. In smaller figures, the profile outline is more abbreviated with a dot to indicate the nostril here and a dot to show the corner of the mouth. This is found primarily here in the left-hand side of the broad hall and at the beginning of the long hall. Let's look at painter number two. He's characterized by a facial outline with rounded noses and well-articulated lips, as

you can see here on Menna's daughter in offering scenes before her seated parents, and this one was taken from this area here. These profiles are often quite aquiline and sometimes disc-shaped. Now, on minor figures, facial profiles show long noses, like you have right here, and gigantic eyes, like this mother with her child wrapped in a shawl around her attending a basket of fruit. Now, this artist may have worked during the reign of Thutmose IV and well into the reign of Amenhotep III, so he was conversant with both styles instituted under both reigns. Painter number three, characterized by thin, expert line work and was clearly the most experienced artist of the group. He did most of the major figures of Menna and Henuttawy in the broad hall, and this painter may also have done many of the finishing details on the clothing, offering piles and offering tables and bouquets. And painter number four. He outlines his figures with a very shaky, sketchy line with tons of corrections. Painter four painted until the line became dry and then went over part of that line again with a newly-dipped brush. I almost wonder if this shaky but somewhat certain outline may have belonged to an older painter. Painter number four is found primarily at the end of the long hall, right here. This is a picture of the Western Goddess, who appears here, and male figures here around the statue shrine. Now, we also use archaeometry for work process, which we see here. We decided to chart ... Because this was such a consistent color that was used, we decided to chart male and female skin tones because that would tell us the difference in mixtures. Did they add more realgar? Did they add more ocher? Did they add more white? And this turned out to be quite interesting. Now, this is the agricultural wall, and the three figures we've got here is Menna. We've got some scribal bureaucrats there, and we have a basket holder. What we found was that with Menna lots of realgar red was used. Again, realgar is a status pigment, mixed with red iron oxide over a layer of white, and this was whitewash that was used to show the transparency of his garment. These guys show more iron oxide. We don't see any realgar whatsoever, and then over here iron oxide. So from this, we can ... We found this everywhere in the tomb that the more important figures had more red realgar, or in the case of women, more yellow orpiment, again, status colors that were brought into Egypt through a extensive trade network. Now, on this wall, on the far right here, there's kind of an interesting scene. You can see the boat. We've got some officials who are coming to visit Menna. We have also somebody who has not paid his taxes being whipped down below, but what I found interesting about this scene is that, take a look at these officials. They all have this yellowish-brown layer that fluoresced under UV light, and when we look at the entire wall under UV, they're the only ones that have this coating, as does the boat.

Let me just say, too, if you could see this, these are the remains of tape that were used to hold up tracing paper by earlier epigraphers. So it's modern. Instead, we can look over to the opposite wall here. Sorry, not opposite but the adjacent. So here's the ship here, and here, you can see that we find the same kind of fluorescence and also the same mixtures for Henuttawy as we found with the skin tone of the officials. So taking into account this. Let's look at the work zones here. Let me backtrack a little bit. So if we look at the entire wall based on the pigment mixtures of the skin tones, the two figures of Menna here are done by the same artist, the same mixture. The two daughters down here below were a mixture of arsenic sulphide orpiment and some ocher and white. The blue lines here indicate change in mixtures or technique or where work stopped for the day. Up here, you could see the grain is different on this side than it's different on that side. Could be different artists. Could be different days, and then if we look right down here, this blue line here mimics a red line that was drawn by the artist, which sort of is a way of, "Okay, I've finished here for today and will pick it up for tomorrow." So it was just kind of like a holding mark for the artist, and then if we look up here for the green, what happened here with this fluorescence is that they had a little left in their pot after doing the coating and the transparency on the figure of Henuttawy who was over here on the adjacent wall and just kind of used it up on this small scene. So what this tells us is that the artists are constantly mixing pigments, adding white or ocher to vary tonality, using orpiment or realgar to brighten up the figures and a number of the figures are painted on a layer of white, which could be probably to brighten their hue. Now, last what I'm going to talk about is one of the great things about Ancient Egyptian art is that there's always something going on, and this is just an example of it on this wall. This scene, or the entire wall, has to do with Menna's self-presentation, obviously. Tombs were open for family members and also for visitors, and it could be because they were looking for ideas for their own tombs. It could be because they were relatives. It could be you could actually have school groups who visited some of these tombs. So this whole wall has to do with his self-presentation because of course Menna is an overseer of fields. So this shows you all the activities that took place at that time. Now, I put the self-presentation around the horse because horses are status items in Ancient Egypt, sort of like, I don't know, the Maserati of the 18th dynasty. So let's look at this scene. So this is Menna's career as a tax collector. What we have here is that the fields are being measured in order to assess the yield and also to assess the tax that the field owner would pay. Moving on. Menna's family also. His daughters are in the hareem. They are ladies in waiting to the royal court, and then we've got the

seasons that are being represented by certain activities. We have the furrowing of the ground, the sowing or the planting of seeds here. So that is what would happen during the season of Akhet or during the inundation when the Nile flooded the Nile Valley, and then we have harvesting and processing, which happened during the season of Shemu. What we've got right here is the harvesting of linen, or actually flax. You have the harvesting of grain here. You have the processing, which included the threshing, the winnowing and then also the tally of grain. And last but not least, the growth, the season of Peret, and here you can see the fields high, overgrown with flax. There's another thing to point out here, which is that this little thing here used to be a donkey and was likely taken out because the donkey was in some ways associated with the god of chaos, Seth. I could talk about this wall forever, and certainly I can point out that we have some scenes here that were copied almost 1,000 years later in another tomb. We have a graffito here that talks about the girls fighting. So somebody who came into the tomb just kind of left a little note there, but it is a very, very active, interesting wall with lots of details of everyday life. And here we go. The entire cycle of the seasons has to do with the cycle of eternity, which Menna will join in the hereafter. So these are the three Ancient Egypt seasons and symbolizing the cycle of eternity. Last but not least, let's go ahead and take a look at the model. So this model came out in 2020. ARCE started an initiative to scan and document past ARCE projects. ARCE worked in partnership with Archimedes Digital and the Ministry of Tourism and Antiquities. The Tomb of Menna was ARCE's first launched virtual tour, and since its debut in April 2020 has had over 2 million hits. The tomb also has some informational things here where you can learn about Sheikh Abd el-Qurna. Let me go back into the tomb. Go back, go back. And also in the tomb. Information, say for example, about the patterned ceiling. Moving on. Be able to see details. This is a very, very important scene here, the weighing of the heart. It's between this and another tomb which one was the first, and it depict Menna's heart here being weighed against the feather of truth, and as it says in the blurb, if his heart was as light as a feather, then he would pass into the next world. You can also manipulate this, as you see fit. You don't have to hit the play, but it's a wonderful tool, and I certainly have had a lot of fun with it. So in the last 45 minutes, I've presented the results of the interdisciplinary team of conservators, digital specialists, Egyptologists, scientists who examined the tomb chapel of Menna in-depth. Now, 11 years ago the project was the first of its kind. Today we are light years ahead in terms of noninvasive techniques and instrumentation. Remarkable multidisciplinary work is being done

on every kind of Egyptian monument today with the aim to preserve and document these treasures for future generations to learn and enjoy.

Louise Bertini:
Oh. Well, thank you so much for that amazing lecture, and we already have a number of questions.

Melinda Hartwig:
Oh, goodness.

Louise Bertini:
So you can get ...

Melinda Hartwig:
I could just get started.

Louise Bertini:
Answer as many as you have time for.

Melinda Hartwig:
Okay. Let's see here. I'm going to make this just a little bit larger, not because I want to see myself, but ... Chat. All right.

Louise Bertini:
Not the chat. The Q and A.

Melinda Hartwig:
Oh, the Q and A. Oh, okay. There we go. Okay. "I assume the missing face is intentional damage." Yes, it is, and it can be from a number of factors. It could be something we call damnatio memoriae, which is people who knew Menna coming in to sort of destroy his well-being in the hereafter. Remember Menna was a tax collector, so I'm sure that he ended up having a number of people who were not particularly happy with him. It can also be Coptic because a number of these tombs were basically used as homes during the early Christian period. So it could be that as well.

"What purpose did the beeswax serve in antiquity? Why apply it?" Good question. There are two ways of explaining that. One is that it would give a certain sheen, get a little bit more sparkle to it to the picture. Also because beeswax is a substance that is associated with the sun god, Ra, and every Egyptian hoped upon death that they would join Ra in his solar boat as he went across the sky.

"What's the meaning of Menna's name?" Menna. Just “mn” having to do with stability, and yeah, basically that.

"Was beeswax application on images of hair a common practice or specific to the tomb of Menna?" No. It actually occurs quite often, and now that we've got these wonderful spectroscopic equipment, it's much easier to be able to identify it on the wall.

"Why was B72 placed on the walls?" It was very popular early in the 20th century, a material to stabilize the flaking of the paint off of its plaster matrix. So it's still used today, but it's not common among conservators today.

"Do you have any thoughts on Henuttawy being associated with the scribal accoutrements pictured under her chair on the wall with the Valley Festival scene or concentration?" Okay, so I've got to say, it's very clear to me that Menna married up. She's, by all means, from a very noble family, and the fact that she's also represented in the tomb, nine times out of 10, being at the same height as her husband suggests that she had a certain status, and also with her husband as well. I am of the belief that she probably could write or read. There are others who I know will argue vociferously that no, actually that's the scribal kit underneath the chair of Menna. So it's up to you to decide. Okay.

"For the offering table that was a different grid size, you noted its difference. Why is this unusual?" Right. "What would it indicate? Has this different grid been used before or after? Any difference in materials or concentration?" Okay. Another great question. Well, you're just firing them off, aren't you, Gwen? So it was unusual because most grids would have just ... The 14-square grid that held Menna and Henuttawy would have also been used to construct the offering table. This led to the belief that perhaps the offering tables were done later, that the space was left there. Somebody once suggested that perhaps there was a specialized painter for offering tables, but it certainly shows the importance of the offering table because

basically this is something that will be magically or creatively activated within the liminal are, sacred area of the tomb.

"Thank you very much. I would like to know more about the blue colors." Yes. So the blue colors, as I said, are ... They're basically silica-based. It's like faience, so to speak, that has been produced and then ground up for use as painting material, and that occurs both with green, Egyptian green, and with Egyptian blue.

Oh, Stephanie Elkin Bates. Hi. "Was the transparent clothing a thinned whitewash over an earlier dark paint or thinned out reddish paint to make a pinkish color?" Yeah, so it just depended on the figures. With men, you have ... the pink could be a thinned out reddish paint over a white ground, or it could be a thinned whitewash over an earlier dark ... Basically could have both, or in the case of men, you could have just a paint mixture that was painted on. It seems with the men that it was mostly whitewash. With Henuttawy, goodness. The transparency there has a number of interesting elements in it, including orpiment and of course white. Brown, as I mentioned, is sort of a mixture of every single color, but hers was very, very complicated.

Oh, Diane. Diane Hilton. "Is it possible to get a map of where the Valley of Colors is?" Yes, absolutely. Send me an e-mail, and I'll send it to you.

And, "Where would I find a grid of the offering table discussed, please?" Nowhere. It's in the book, which I mentioned is going through its second printing, but I'm not sure that I said anything about an extra painter coming in in the book, but the grid is definitely discussed on the wall, on that agricultural wall.

Jeff. "Can you comment on the meaning behind cones with sometimes appear on the figures' heads?" Yes. It's interesting. These cones of fat, I believe it was a Amarna that they recently found some physical cones. The idea behind the cones is that they melt, and they also had scent. They were used to keep the skin supple, and it was incredibly dry in Egypt. So while the substance might be kind of revolting to us, in Egypt it was considered to be something that would ... Cones were considered to be something like you'd wear to a party, so to speak.

Okay, Marie. "Thank you for a fascinating" ... Okay. "Is there any evidence to show methods of marking or cataloging the amount and/or type of work performed

daily/weekly in order for artists to get paid?" Yeah, there's been a lot of work done on that by Kara Cooney, and she's been looking at the material from Deir el-Medina. It's mostly Ramesside, 19th, 20th dynasty date, and she has come up with some interesting observations about that. Here's the thing. It's not ... We wish we had contracts. We wish we had more contracts. We wish we had copy books that the artist used to paint their scenes. Unfortunately, they just didn't work that way. I think it was probably more of a verbal understanding or a verbal exchange between the painter and the patron.

Dr. Hussein Ari Mahmoud. Thank you. "I appreciate the use of VIS spectroscopy to evaluate the conservation process. My question is, why the artist added orpiment to the red ocher in red areas. In contrast, he used it intentionally with the yellow ocher to produce a brilliant appearance." Okay, now, if I understand this. Yeah. So it's a mixture. The thing about orpiment and realgar is that they occur together in nature. So it would be very easy to have both in a mixture. You can't separate them completely, but also the yellow could be added to create something warmer and yellow ocher also to create something warmer. But it is known that orpiment and realgar were prized for their brightness in the ancient world.

Okay, Fred Botha. "Were all the activities represented on the walls photo-type records of Menna's achievements for those after him or possibly his prayers that he would enjoy the same activities in his good life of plenty forever?" Records or prayers? Can I just say, probably a little bit of both? Certainly there are walls that show his career. There are also other walls that have decoration of past times that he would enjoy in the next life. You also have to bear in mind that the tomb is a sacred space and that upon burial it could be ritually enacted or ritually brought to life so that these would be available for the deceased in the next life.

Okay. "Were all activities represented on the wall" ... Okay, I already answered that.

Anna Serrata. "Apologize if I missed this, but what do you suppose is the material this is fluorescing so strongly in the pentimento that you showed? It's quite different than the surrounding gypsum, and the fluorescence is quite different from the typical appearance of mineral pigments under a long-wave UV." Okay. That is a very, very good point, and I ascribe this to that they used gypsum and perhaps some kind of organic that would, of course, fluoresce under ... So it was the white

gypsum that was mixed with an organic that would fluoresce under UV light, if that answers your question.

"Can you speak to the color palette more? You've remarked on the use of status pigments. Were there colors or pigments deemed to be performative or have agency?" Well, that is an interesting question. In terms of the color palette, a lot of people will say the usual colors, red, yellow, green, blue, black, white, but there are a lot of mixtures to create a more varied color palette. In colors or pigments deemed to be performative or have agency, red is certainly a color that was thought to have sort of a performative aspect to it. I don't see much evidence that the artists would have looked at it in that way, but definitely I would say red has that, but it would have to be in a particularly kind of scene, not skin tone.

Okay. "When using acetone to clean, how do you avoid removing the actual paint?" It's very easy. The paint is already in the matrix, and it's applied with a very ginger touch. We lost nothing by using the acetone to clean.

"What year was the tomb created?" It was created during the reign of Amenhotep III, probably after his year 30. Depending on what chronology you use, I think you're looking at maybe about 1390, 1380 BC.

"Will you be able to share the link to the 3D tour?" Yes, yes. I had that on my last slide, and the best thing to do is just go ahead and Google American Research Center in Egypt, and the link will be there.

"As the tomb is open for visitors, how did his family keep it clean and safe?" Well, the way ... Tombs were open for various festivals, and probably during the life of the family or the relatives, they did their best to keep it safe. There is good evidence that there were doors that closed the tomb, but as relatives die off, more and differing type of people can come into the tomb.

I already answered that. Let's see. Oh, thank you. Thank you.

"Very excited about your new Great Courses 24-episode video course. The Great Tour is a guided tour of Ancient Egypt. When can we expect that?" Taping will be in early fall. You know that COVID has now kind of changed everything, but they are hoping for a 2021 launch date, probably mid 2021. There's a lot of production

that has to take place for that to happen. It's unfortunately not just me talking to a camera, but it should be then. They'll post when it's going to be out on the Great Courses. Okay.

"You talk about visitors in the tomb copying certain scenes. Would the tomb not have been filled with" ... No, no, no. "Would the tomb not be filled with the deceased's goods?" No, the burial was underground, and it was completely ... When his body was placed in there, when bodies of families were placed in there, completely sealed up. So that's where the tomb goods would be. This is the aboveground chapel that would have been open for family members and others. The certain scenes, yeah. It is not only appreciated today, but the tomb was also held in high regard, even in Ancient Egypt. So great idea to go in and see what the painters did, and let's copy it down and put it in our scenes. The scenes I'm talking about are in the Tomb of Mentuemhet, and they are cut in relief.

"Why is this tomb so well-preserved?" Yeah. Well, Menna was pretty lucky, and also because I believe the early conservation that was done in the tomb certainly helped preserve it, and may I say, it's also because it's just spectacularly painted that people certainly valued it and wanted to make sure that people could see it and it would be okay.

"Was Menna's mummy found in his tomb? Were there any artifacts?" When it was excavated by Mond in 1905, no. The mummy was not found. The scribal stick that was used by Menna was found. There were bits and pieces of wooden furniture, things like that. Nothing to write home about.

"Am I right in believing the Tomb of Menna is unfinished, and if so, is this to do with superstition? Was beeswax a" ... Okay, I already talked about beeswax. Yes, the tomb is unfinished. It's pretty finished, but it is unfinished. I know that there is this idea that the tombs were never finished because it meant that that person would die. I'm not really sure that that's the case. I think it really has to do, personally, with the fact that the artists are being taken away, are being siphoned off from working in temples or working in palaces to paint the tomb. They don't have a lot of time, and they do what they can do. So time is definitely a factor there.

"Was this tomb constructed during Menna's lifetime, and if so, would he have seen it?" Yes. He would have seen it, and he would have had input into the design. Absolutely, he would have. Patrons had agency. He probably came to visit his tomb, see it being made, and the other thing that was quite possible is that the tomb could have been used during his lifetime, meaning he's not buried in there but maybe for particular Necropolis festivals. They would have celebrated them in the forecourt of the tomb.

"Can you please tell us more about how you overcame the fluorescence issues due to resins and the Egyptian blue itself?" Right. So that is a good question. Thank you, anonymous attendee. The problem with the B72 ... So the RAMAN effect is a very weak effect, and if you have a lot of fluorescence it's going to block getting good readings, and that was ... We were all frustrated because RAMAN was brought in to work in tandem with the XRF, and it's just the case. I wish we would have done this after we cleaned the tomb because the archaeometry season was in 2007, and perhaps we would have gotten better readings with the RAMAN. The other is that you have to understand: This is 11 years ago, and this equipment was state of the art at the time, and it was huge, and it broke down all the time because of the dust, because of the heat. And now I have to say the instrumentation they have is so miniature or much, much smaller that you're able to do what we did in 3 years in probably a matter of hours. It's amazing.

"Why is the bottom of the tomb less preserved?" Well, because they were digging into it. That's where they were digging the burials.

"Did the conservators replace the B72 with a modern equivalent to help consolidate the pigments?" The B72 is still there, and, yes, they did do some modern consolidation of the pigments using industry standards. Okay. Is that it?

Louise Bertini:
Oh, no. If ...

Melinda Hartwig:
Oh, "Is the tomb raided in antiquity?" Yep. Yep. It was. That's what happens.

Oh, okay. Wait, wait, wait, wait. "Have you been able to identify tomb artists across multiple tombs?" Yes. Definitely the Tomb of Menna, those artists I found

in the Tomb of Pairi, Theban Tomb 139, and also in the Tomb of Neferronpet, Theban Tomb 249, and a number of others.

"Any ideas on why there is so little writing except on the entrance?" Oh, there's plenty of text in the tomb, believe me. Plenty, plenty of texts on the walls.

"Did we find Menna's wife's tomb?" No, we did not because she was likely buried with him, like most women were buried with their husbands. Their husband's place or status in life, their position is what secured the burial. So that is why the wife was buried with her husband.

"Were these paintings begun during the lifetime of the subject?" Some were. The thing in Egypt is that there's always changes. There's no absolutes, I guess is what I'm trying to say. They ... Whoops. I think you just disappeared. Did you disappear? Okay. Yeah, so in most cases the tomb owner probably would have waited until he had achieved his highest office and then had his tomb decorated because he would have shown his highest titles. We do have some tombs, like the Tomb of Horemheb, Theban Tomb 78, which was done over a period of time, and you can tell the difference between the broad hall and the inner hall with the painting. So it definitely varies.

"Was there a beeswax-making scene depicted?" No, I'm sorry.

"Do you have a thought on why Menna's youngest daughter wasn't shown?" Because she was on the wall in the broad hall to the left, and a majority of the decoration had fallen away there. I was able to make out her name because of the text, but not her figure, unfortunately.

"What was the greatest challenge encountered during the project?" Definitely it was working with the spectroscopic equipment and everything breaking down, and RAMAN had to be done in complete darkness to get those readings, and XRF could be done relatively quickly not in darkness. So there was a lot of back and forth about that. Thank you, David.

Yeah, okay. That's a good question. Okay. "How do you see the various technologies used in analyzing the Menna tomb changing, advancing in the coming years?" Well, for one, the miniaturization, that they're much, much smaller. You can, for example ... Now we're in the age of photogrammetry. You can use photogrammetry and record a tomb, probably in a couple of hours, let's just say a smaller tomb, and with the archaeometric equipment, there's probably a couple

hours ... So basically just take into account that you've got a day where you can make all this come together, and this is largely because the field has moved forward, and the important thing is, and let me say with the use of spectroscopy, it's not only the answers it's provides in terms of materials, but it also gives us a tremendous amount of information that the conservators can use for their strategies. And as I said, too, during the talk, to trace work process and particular techniques used by artists.

"Any evidence that the paintings were retouched after the death of Menna?" Yes. Modern retouches. We got some zinc white in there. So, yes, and that was done in the modern era.

Hi, Yasmine. "How do you feel about the argument that the statue of Henuttawy is a fake?" No. No. No. I actually did photogrammetry with that statue, and it fits just fine with the base that's already in the tomb.

"I'm curious about the fighting girls. What are your thoughts on why this particular scene was included?" I think this is included just to engage the viewer. These are not only genre scenes, but there's daily-life scenes. The girls fighting, they're basically fighting over sheaves of wheat that have fallen out of the basket, like the gleaners in paintings in the 19th century. So that's something that certainly would have happened, and also it engages the viewer. It was important for the tomb owner that people see his tomb painting because those people might be convinced to say a prayer for him, leave an offering for him. So I think that that's something that comes to bear.

"The hieroglyphs in front on Osiris in the shrine are very detailed compared to the hieroglyphs in the tomb." Actually, to be really honest, those hieroglyphs, I could focus on the hieroglyphs and show you that other walls of the tomb also have very detailed hieroglyphs.

"Any thoughts on why brown paint was mixed as there apparently were excellent iron oxide pigments?" Good question. Very good question. There are great iron oxide pigments that could be brown. Maybe some of the mixtures of brown were mixed with realgar or orpiment.

"Is there any kind of database for Egyptian tomb artists?" No, unfortunately.

"Do you see any evidence that the more important artists have better quality, more expensive pigments to use as normal practice, i.e. not just with who they are

depicting?" I think it actually has to do with the status of the tomb owner that they have the use of these particular pigments because it probably would have been folded into the pay structure that the patron would have paid the painter, and the normal practice is not just with who they are depicting. Yeah, sure. Absolutely. Yes. In the Tomb of Menna, you have the main figures being ... they used the arsenic sulfides, but also you find it in the agricultural scene there was one scribe who was holding a scribal palette and that had been painted with orpiment. So it's also ... Scribal palette is a status tool indicating that person could read or write when probably only 3 percent or 5 percent of the population could do that. So there you go.

"How long might it have taken to paint the tomb?" Good question. There is a graffito from the Ramesside period that says that a small tomb, and I believe it's from the 20th dynasty, a small tomb took 3 months and 16 days. So until we find some more graffitos, that's a pretty good indication. And some people have said that that correlates to the time of mummification. So there we are. Thank you, all. Thank you, all.

Louise Bertini:
And thank you for also answering everyone's questions.

Melinda Hartwig:
Happy to do it.

Louise Bertini:
So again I want to thank Dr. Hartwig for her wonderful lecture, and thank you, all, for joining with us and staying with us until the end. And if you're interested in supporting work like Dr. Hartwig's as well as ARCE's efforts to digitize past conservation work, I urge you to visit arce.org and make a contribution today. Of course we rely on your support to make this work possible, and if you're not a member and would like to access more of our fantastic member-only lectures, we'd love to have you join us. So thank you, all, again, and we look forward to having you all join us at our next public lecture on August 19th. So I hope you all have a good evening or day, depending on where you are, and thank you.

Melinda Hartwig:
Be well, everybody.