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Virtual Lecture Transcript

The Temple of Khonsu at Karnak: Conservation Challenges
By Nicholas Warner
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Liska Radachi:
Good afternoon, everyone, and thank you for joining our June public lecture with Dr. Nicholas Warner, The Temple of Khonsu at Karnak Conservation Challenges. I'm Liska Radachi, the US director, and I am so pleased to have you with us today. Before we get started, a brief reminder that our next public lecture will take place on June 26th at 1 p.m. Eastern with speakers Aaron de Sousa and Amber Hood, featuring a discussion on Egyptology's interdisciplinary future, and for more information and to register you can visit arce.org. So today, I am honored to introduce our ARCE colleague, Dr. Nicholas Warner. Dr. Warner is an architect who has lived in Egypt since 1993. His primary research interest is the Islamic architecture of Cairo reflected in publications such as "The Monuments of Historic Cairo: A Map and Descriptive Catalog" and "The True Description of Cairo: A 16th Century Venetian View." Over the past 25 years, Dr. Warner has participated in or directed numerous physical projects related to the documentation, presentation, and preservation of historic structures and archaeological material throughout Egypt. His projects include work in Saqqara, the Western Desert Oases, Luxor, Sohag, Aswan, Tanis, and Cairo. Many of Dr. Warner's past projects have been supported by grants administered by ARCE. And in 2020, he joined the organization as our new Director of Cultural Heritage Projects with further responsibility for publications. The upcoming project at Khonsu Temple, which he is introducing to you today, is one of a series of conservative initiatives that are in the pipeline that ARCE looks forward to enabling in the coming years. So, today, Dr. Warner will take us through the project at Khonsu Temple, which is one of is one of the most prominent temples in Luxor. It's situated within the southwest area of the Karnak Temple Complex on Luxor's East Bank. And, Khonsu Temple is an excellent example of a small but complete new kingdom temple with some of the best preserved and most vivid relief carvings at Karnak, which had been hidden under centuries of smoke and grime. So between 2006 and 2018, our city oversaw an executed conservative and documentation work in the temple via the training of 59 conservators from the Ministry of Tourism and Antiquities with funding from the time from USAID. And at that time, in addition to cleaning and conserving six chapels inside the temple and two of the external facades, the project included structural repairs to stabilize the monument, a photographic documentation training school for the Luxor Inspectorate, and the introduction of visitor information and signage. And just last year, in 2020, ARCE prioritized the completion of the conservation of this major pharaonic monument starting in fall of this year. So, Dr. Warner is leading this very important endeavor on behalf of ARCE, and we are so glad to have him with us today to discuss the project. So, please welcome Dr. Nicholas Warner.

Nicholas Warner:
Thank you very much, Liska, for that very full introduction, which saves me quite a lot of preliminary remarks, and welcome to Egypt, everybody. I am speaking to you from Egypt at the moment. So, the Temple of Khonsu, in Karnak, has been the focus of much ARCE activity in the past 20 years, and I'd like to, first, before I discuss what the plans are for the future of this site, to take you through a little bit of the physical context and the historical context of the restoration, the early restorations that have taken place because I believe it's important for anybody attempting to conserve for sites such as this to have a familiarity, more than a passing familiarity, a deep familiarity with what's going on before. And so, there's been a certain amount of detective work on my part to uncover the sequence of repairs at this site over the past 150 years. So just a small piece of context from the Egyptological point of view, and I should stress very much that I am not an Egyptologist, so I will not be able to answer any questions tonight about Egyptology, but obviously Khonsu is one of the Theban Triad of Gods of Amun, Mut, and Khonsu. He is the son of Amun and Mut and represents the moon good. And on the right here, you see a very wonderful sculpture that was discovered inside Khonsu temple in 1904 by then French director of the area of Karnak, Legrain, and it shows Tutankhamun as Khonsu. And on the left you can see the figure on the far left of the triad group, sitting on Ramessesnakht, the lap, is Khonsu, identifiable by this braid of hair on the side of his head. As Liska said, the temple's located in the southwestern corner of the complex of Karnak, within the great enclosure walls of Karnak, and you can see here the location as reconstructed by Jean-Claude Golvin, looking south in fact. So, it's looking from the back of the temple. And, here we have a 1993 aerial photograph that just shows the different bits of construction around Khonsu Temple. So there is the temple itself, which has a fairly classical form of temple inasmuch as it's got pylons with a court, hypostyle hall, and then a series of chapels arranged around an ambulatory at the rear end of the temple. Other buildings immediately approximate to the temple include the Opet Temple on the left there and a gigantic gateway built by Ptolemy the III Euergetes, the Benefactor, and these buildings span over 1,000 of years of construction history, so the time span is vast. And, of course, that's ignoring the modern edition of magazine which I'll be talking about in a little while in 1957, next to the temple on the western side of the temple. So just an overall plan of Karnak, situating Temple of Khonsu in the southwest corner, and it was at the end of a avenue. It was approached from an avenue and a gigantic gate, which is this, the Euergetes Gate. And, this is the first view that we have of the temple from the time of the "Description de l'Egypte," at the end of the 18th century. In the middle of the 19th century, we have one of the earliest photographic proofs of the condition of the building, which was a salt print taken by ... a photograph taken by Felix Teynard, and it's in these photographs that I'm showing you, you have to remember that there was a gigantic wall here, which has disappeared by the time of the "Description," but probably long before, maybe reused as fertilizer. It would have been made out of mud brick, this structure. And so, one has to reconstruct that mentally when one looks at these early views of the temple, and it has been reconstructed in the very minimal way today, as you'll see, a fairly typical 19th century photograph with sort of Orientalist leanings, various villagers from the site who are shown draped elegantly over these sphinxes at the entrance to the temple. It's also very important to remember that until fairly recently this served as the main entrance to the

site of Karnak. This is a photograph, an aerial photograph, which I think is by Gaddis. I haven't identified the author of the photograph yet, but it shows a clear road running to the right of the temple, and this is where people came to with kalishes from Luxor So they didn't come on the present approach from the riverside, from the western axis. They came from the south approach. And so, you can see it here. Instead of writing a postcard, you could even put a stamp from the Egyptian post office on to your postcard which showed the same thing. And this is what it looks like today. The reason I'm stressing slightly this approach is that is one of the major projects of the Antiquities Department that is reaching fruition at this point in time, which is the reopening of the Avenue of Sphinxes that once connected Luxor Temple with Karnak Temple, ending at the Euergetes Gate and the Temple of Khonsu, behind. So this has placed a new focus, shall I say, on the importance of our conservation work in the future. Early maps show that the temple had a village next to it, quite a large village with substantial buildings, and the village of ... the presence of the village of course, no doubt, contributed to some of the conservation problems that we have in the temple such as the burning of surfaces, the deposit of soot, many of the ruins were used either as stables or for bedding, used for kitchens, and a lot of the material would have been taken from the temple, loose blocks would have been reused in this village, and you can see it here in the distance in this aerial view from 1914, looking over Karnak and in the distance there, you can see it's a bit blurry, but you can see the back of the temple. And then on the right, a very large number of buildings, some of which are at least two, if not three, stories high. So that is now a vanished landscape from the area of Karnak. This is the facade in the late 19th century, after it was essentially dug out from the ground, and you can see immediately the effects of water erosion on the lower courses of the stone work is very, very severe, or a lot of material disappeared in this process, this long process of erosion that took place over centuries. And this picture is particularly interesting because it shows many of the immediate conservation problems that had to be faced after the evacuation of the temple from the ground. You can see in the distance, actually, the ground level is still quite high at the back of the temple, but you can see in addition to the erosion damage, you can see either collapsed or collapsing roofing blocks and whole sections of roof that are missing, including that within the thickness of the pylon itself. Another very early photograph, rather important because it shows the preclearance level of the temple, and this, which may be one of the earliest colored views that I've found so far, showing that the coloration that was still evident in the first court of the temple, again, prior to the clearance. And this is a picture of the drawing, a pencil drawing, by an American artist who visited the temple and represented it after the clearance, so there's rather significant difference in the appearance of the structure. Since 1858, Karnak has been the subject of considerable investigation and conservation by a series of distinguished French archaeologists and Egyptologists, starting with Auguste Mariette, who was the person who initially actually started working at the site, followed by George Legrain, who is the one who found that wonderful statue of Tutankhamun as Khonsu that I had the at the beginning of the talk. And then, Maurice Pillet and Henri Chevrier, and now, of course, the French are involved through the Center for French Egyptian Studies of Karnak Temple under the direction of Luc Gabolde, now, a very extensive collaboration with the Egyptian Ministry of Antiquities and Tourism. And what did they do during that period? The answer is quite a lot. So, first thing, is they infilled all the missing

masonry at the bottom of the walls, which had been damaged and removed by erosion, destroyed by erosion, and they refilled them, the losses, with a fire brick, red brick laid in cement and then plastered it over. And, I think the facade certainly was blasted on more than one occasion subsequent to that. That seems to have happened at the very end of the 19th century, beginning of the 20th century, and of course the critical word is cement because, of course, cement was, at the time, a rather wonderful material to use, and now we have the knowledge to see that it is in fact rather a dangerous material to use, regular Portland cement. So you can see here, the side view on the pylon, this is showing the brick work, and at this point it didn't actually meet the rest of the stone work. They stopped it and just blasted it. An entire column was blasted into this courtyard, it was rebuilt into this courtyard of the same material and replastered. A lot of the major structural repairs were carried out, such as the reroofing of the pylon, as you can see here, with steel beams, above your head there, necessary structural repairs. Here again, in the further parts of the temple, over the hypostyle hall, we have roofing blocks which were bolted together to prevent further collapse, and these are clear, honest structural repairs, and they will be maintained in any future conservation project. What may not be maintained, or certainly won't be maintained, are a lot of the textured cement fills that were done at the time, going through until the 1920s and can't be very precise about when some of these things happened. But there was this period in which this rough cement textured fill was being used with struck joints. That's to say a delineation of joints which would not have been visible in antiquity, but they are clearly described in this new treatment, which was subsequently repaired itself by scraping off some of the cement and replastering it with a non-textured finish. You can see it in other places where the cement has been simply covered over with a kind of slurry, and the joints, you can see the struck joints there. This is a very intrusive kind of repair and the fills that were executed will have to be taken out and redone in synthetic materials using lime-based mortars rather than anything cementitious. So, I mentioned the role of the French in the preservation of the temple and the large site of Karnak. I also need to mention the fact that Chicago House, the local arm of the Epigraphic Survey of the Oriental Institute of the University of Chicago's been working on the epigraphy and, actually, more than the epigraphy in collaboration with ARCE in the most recent period of their work on site, and they've been producing volumes of very significant information, covering aspects of their work from 1935 through present. ARCE started working in 2006 with funding from USAID and carried out an incomplete program, I think we can be honest about that because it is incomplete, which included some major structural repairs and architectural conservation, but an incomplete program of surface conservation, particularly the polychrome surfaces that we'll come to in a minute, and only a partial conservation of the facades. Some work was done laying new pavement, considerable work was done laying the new pavement inside, both inside and outside the temple, and significantly a site conservation laboratory was built, which is a major asset to future heritage site managers and for training purposes, which also used for ... It was also used very much for the training program for Egyptian conservators, and as Liska mentioned 59 Egyptian conservators were trained on this project over a period of a decade or more. This slide on the left shows ... this picture on the left shows you some of the repaving work and a lot of interesting epigraphic material emerged from reused blocks that were in this pavement, and it was laid all the way down the center of the

temple axis. And, you can see on the right, this is the plan where I have identified all of the previous inventions and their dates, carried out by a number of conservators including Christy Pohl and Claire d'Izarny, and latterly John Shearman and Khadija Adam, who are in charge very much of the training program for conservators in the latter years of ARCE's involvement on site. So, it looks as if there was a lot done, and certainly there was a lot done, but there's plenty more to carry out. This is a picture of Dany Roy, who is very, very sadly passed on now, and I'd like to dedicate this lecture to Dany who was a remarkable master mason who worked for many years in Egypt, not just on pharaonic monuments, but also Islamic ones and his presence is sorely missed. He carried out a lot of work that was done on the roof of the building because one of the major problems is to create adequate water shedding and to make sure that all the joints are filled on the surfaces of the roof. And so, quite a significant amount of work was done to tackle this problem and to actually get water to flow off the roof because although people think it doesn't rain very much in Egypt, when it does rain, it rains extremely hard and the results are often catastrophic. So one has to bear in mind the fact that the water really must leave the roof, otherwise it filters through the joints and destroys the surfaces on the underside of the slabs and on the walls that support them. This is a photograph of the north facade and the Contra Temple which the small temple that was built against the back of the north facade after it was conserved. And, this is a picture that shows you what we call the mega-trapezoidal sandstone painting, gigantic sandstone slabs that are at least 10 centimeters thick or 15 centimeters thick, which are cut in an irregular pattern to simulate some of the irregularity of the ancient paving that had been, that had disappeared, and this was felt to be the right response. I think it is the right response, and it's quite beautifully done by Dany. Everybody focuses very much on the cleaning of polychrome surfaces, blasted limestone surfaces in projects like this, and in my view there's too much initial focus on the cleaning of these fine surfaces, which are obviously the prettiest part of any conservation project. But in the first year of our planned program of work, we're not going to touch any of the paintings, any of the polychrome surfaces, not until we've got the roof sorted out. This shows you where the earlier conservation efforts stopped, you can see a very clear line here between the conserved and the unconserved sections of the wall reliefs. In this case in the court area, the walls surrounding the first courtyard of the temple. And you can see on the right, where the attention went was mostly in the earlier period of work, was in the chapels at the rear of the temple. So, here again you can see cleaned and conserved versus unconserved and in the columns in first court. And just to show you a picture for those of you who don't know about ARCE's conservative lab. It's built next to the Gate of Euergetes and Ptolemy Euergetes, and it's behind this wall, and the thickness of the girdle wall that ran around the hall of Karnak Temple, and the interior has all the facilities of the modern conservation lab, and it is shared with missions who are working in Karnak, and it is going to be an essential base for future work. So, now I've come to the project that we hope to initiate in the beginning ... at the end of this year. We have ... We don't have the security clearance for carrying out our work, but we do have the clearance from the Ministry of Antiquities and Tourism for the program of work that is being proposed. So the security clearances will hopefully come later on in the year, and we'll be able to start actually working on it at the end of the year. And the first part of the work is actually going to not be to complete the building fabric conservation, but I've

missed out the most essential thing, which is to carry out a 3D laser survey, a complete documentation of the temple which has actually not been done and I regard as being the essential prerequisite for any future conservative interventions, and I'll tell you about who's going to do that later on. Then, we're going to move on to a program. This program of work is at least 4 years to 5 years of work that I'm describing to you now. It's not going to be an instant process, and the plan is that we will be working for 6 months of the year on-site, basically from September through to April, and the rest of the year will be devoted to study and documentation, completion of documentation. So, that's to take advantage, obviously, of the cooler winter months to carry out the work, and that has a very sound practical reason which is mortar that is used in conservation work dry out much, much faster, too fast in fact, if it's carried out during the heat of the summer. We're then going to, at the end, after we've done all that work. And, I should say that when I say complete polychrome surface conservation, there's more than 2,500 square meters of wall and decorated surface to deal with, so it's a very, very big area of work that we have to do. Once that's done, we're going to have a look at all of the loose fragments of statuary and altar and the barque stand that is at the back of the temple, and we're going to think about how to design not only safe visitor access to all parts of the temple but ones that are appropriate and don't conflict with one's aesthetic appreciation of the temple. And, we're going to also continue with our well-established training of Egyptian conservators in both the theory and practice of conservation, so that's the scope of work. So the first thing will be dealing with the roof, as I've said. And, obviously, a lot of the sandstone blocks are quite fragile and will require consolidation and probably using ether silicate in some cases. We're going to try and do a minimally-invasive or aggressive treatment on all surfaces as far as possible. The roof is particularly important because of the fact that it preserves an enormous number of very interesting historical graffiti, some of which you can see if you peer closely at the center of this image, you'll be able to see a pair of feet there carved on the surface, and there are many, many graffiti which have been documented and published already. We're going to try and find solutions for areas of missing roof. A number of the chapels have lost their roofs and that is, of course, a source of water penetration, so that is definitely a problem that we'll have to solve. We'll also have to stabilize and point all the vertical surfaces, so these walls are more or less like dry stone walls now, they've lost all of their water, but actually connected the blocks together. So this will have to be fixed with lime waters that will be appropriate for that context. And, we're going to remove all of the brick and cement repairs of the base, particularly in pylon, base of the building where the material was lost through erosion, an to replace those areas with new sandstone blocks, which will be probably quarried from Gebel el-Silsila quarries, sandstone quarries, which are just north of Aswan, so I shall be going to look at the stone probably in November for this aspect of the work. The pylon itself has had some rather horrible treatments which are incomplete and need to be redone in many cases, so that is also part of the package of sandstone replacement work that we'll be doing. Within the temple, there is a problem with bats. Bats fly through the gaps in the ceiling, and during the course of their flight they deposit offerings of their digestive processes on the walls of the temple, and these are very viscous substances which are quite erosive and difficult to remove, so we will have to try and stop that happening as much as possible. We'll also have to stop large numbers of pigeons from perching in very obvious handy roosting spots on top of

the columns that you see here, and a lot of birds can be found, smaller birds can be found in the cracks that exist that are unfilled on the surfaces of the walls and the columns, and you can see the areas in blue on the plan, the roof plan on the right, that shows the losses in the roof slabs where we do have quite a lot of bats flying through, passing traffic. So there we will have to probably introduce mesh solutions, wire mesh. But again, try and design it in a way that is most sympathetic. This photograph shows an area of wall which has been completely unconserved, so nobody's touched this since it was first dug up or dug out, so there we're starting from scratch as it were in terms of conservation. In other areas, there's been partial conservation activity. And here, this is a good picture because it shows you, also, the damage caused by soot. This chapel was probably used as a kind of kitchen at some point, in its more recent history, and so you can see the effects of that on the wall reliefs, the colored polychrome wall reliefs on the picture on the left. On the right, this shows you the areas that we will be focusing on to complete the program of conservation. As I said, about 2,500 square meters of surface remain to be looked at and treated, and there are some areas that I haven't even seen yet, which are basically the ramps and staircase ramps inside the pylons, at least the west pylon, going up to the roof of the pylon. I haven't been able to access those to assess their condition yet, but they are likely to require treatment of some kind as well. And then, we're going to look at the future of the objects, the various objects that there are within the temple. This is a detailed view of what appears to be either an altar or a barque stand, that is at the very rear of the temple, that in the 1950s had a great deal of attention paid, too much attention paid to it in the form of plaster and cement reconstructions, which will have to probably be removed, reversed, and more neutral fill adopted. We have a number of pieces of sculpture lying around within the temple, and interestingly all of these bits of sculpture seem to predate the main construction of the period of the temple. They're older blocks. The one on the left, is, I am told, reliably the Middle Kingdom, and the others are earlier New Kingdom of Ramesside. So, they are all elements of the temple, which I think are important to restorers simply because very often one visits a temple and one forgets that actually the place would have been crowded with statues, with votive statuary and other objects, and it's an aspect that is very often missing, I feel, when you visit an Egyptian temple is that you're not really aware of the volume of statues that there would have been in the interior of the temple. We've also got a number of loose decorated blocks that will have to be either displayed after conservation or taken to new storage facility at some point. Outside, on the various mastabas or benches constructed outside, there are a very large number of granite relief blocks which come from the interior of the barque shrine of the temple which is the main shrine area at the rear of the temple. And these have been studied and reconstructed by various individuals and will be going back to those studies to inform us about what would be the best policy to adopt with such material. Would it be advisable, for example, to try and reconstruct elements of it in situ, or would it be best to just leave it as something for future generations, perhaps, to deal with? A problem ... Duck the problem, I suppose you would say. We will have to see about that. That's in the latter stages of the project. One of the things that I've already started to work on now, however, is a plan to deal with the University of Pennsylvania's Block store that was built in 1957 on the west side of the temple. This is a very poorly-constructed building, and it abuts the western facade of the temple, so we can't conserve the rest of that facade

of the temple without removing not only the building itself but also its contents. It's a very shabbily constructed temporary sort of structure with fiber-based cement roofing sheets and a rather random and ad hoc system of support. But it does contain 16,000 decorated blocks, and we'll see those in a minute. And it is, as I said, bang-up against the temple, and this is an area where you can still see all of the textured cement repairs that were done at the beginning of the 20th century. So this has to go, and many of the blocks ... Of course, all these blocks derive from the period of Akhenaten and from various of these foundations that potentially were in the vicinity of inside Karnak and its vicinity. And this is not the only area of block storage that there is in Karnak, so a coordinated policy with the Ministry and with our French colleagues has to be adopted as to where to put them. Because this is 16,000 blocks, but I think that there are a total of 80,000 in different magazines around Karnak. ARCE has already carried out significant documentation of emergency conservation over a period of 5 years. And there are plans to make the results of that available in digital format to the public. My job is to think about where to put these blocks. And at the moment the plan that meets with most favor is to build a completely new structure which is on the west side, again, in the area of the missing wall of the temple, the girdle wall, the enclosure wall of the temple on the west side. This can be described as a sub-project of the Khonsu project overall, but it's actually a very, very major piece of work that will need quite a lot of funding. But it there is absolutely no doubt about the importance and significance of doing it. It should be done. One of the last things is to design the visitor information and the visitor flow patterns. Maybe not all of the chapels should be open to visitors. Again, these subjects are sensitive and they require consultation with our Egyptian colleagues. For example, do you allow people to go up to the roof? There's a chapel on the roof, and visitors could be encouraged to go up to that area, but not to walk any further on the roof. So these are questions that will have to elaborated on later. And finally, through all these different periods of different activities that we're going to be carrying out, there will be a continuing component of training for Egyptian conservators. Both in the theory and in the practice of conservation because very often, I think ... In my experience, now a quarter of a century, perhaps not enough attention is paid to the theory and the ethics of conservation in training programs here, with more of a focus on hands-on work and recipes for treating material. So that's something that I think maybe we will try and tweak a little bit. This slide shows you our able, local team that is going to be the linchpin of the success of this project, lead by Rais Mahmud Faruk, who has worked for many years not only with the American Research Center at Khonsu, but with numerous archaeologic missions all around Egypt and within different areas of Karnak. We have Shaaban Mohamed, who is the head of the ARCE office in Luxor, and Ahmad Badawy, who runs the conservation lab, and Mohamed Saleh, who does everything that one asks him to with great pleasure. The first thing that we will be doing is a complete 3D survey and scan, and for this I'll be relying on the very able Pietro Gasparri, who has collaborated with me on work at the Red and the White monasteries over the past 6 years now, and has produced the most wonderful documentation, which is of extreme use in planning any conservation interventions in the future. A key member of the team. We have James Wheeler, who is going to be new to Egypt, but who has worked on the architectural stonework of Aphrodisias in Turkey for many, many seasons. And he is going to be supervising a lot of the sandstone replacements and carving work that will

need to be done on the initial project, particularly on the pylon end of things. And we have Bianca Madden, who I think many of the people attending this lecture will be familiar with her work from other sites in Egypt, and she will be directing the polychrome surface conservation campaign. And Theo Gayer-Anderson, a long-term partner of mine, will be working on the stone conservation aspects with Hani al-Taiyyib, who again has been a right-hand person for me for many, many years. I have worked with most of this team for a long, long time, so I'm very confident in their abilities. This is to show you that things have started on-site. It may not look like much, but this ... If I will just press this button ... Might show you the process of slaking lime, which is being taking place now at the site for the last few months. And for those of you who haven't witnessed the production of lime, you add water to burnt lime, and you get a very, very strong exothermic reaction which you saw in that little video. And this is Rais Mahmud's work here that we're looking at. It's slaked in tanks, and then it is regularly turned manually so that it breaks down into a nice slurry, and can be used a minimum of 6 months to a year after fabrication. So that's already happened, so we have got 6 tons of lime on-site, which will be ready for use in the project from January 2022. I'd like to just thank all of the individuals who have actually stumped up and come forward to help us pay for some aspects of this project. And in this particular case, I think we were targeting the purchase of the sandstone for the repairs to be carried out on the pylons and in other areas. So I would like to extend a special thanks to all of these individuals who have so generously donated. And I look forward to updating each and every one of them in the future with progress reports from Egypt, from the site, to tell them how we are getting on. So a big thank you to everybody who was so generous in that way to this project. I think that's all the time we're going to say this evening, and I thank you for attending this virtual talk. And I understand that there is a process of some kind of questions. And we ask the office staff, who have been very helpful in setting up this meeting, will guide you through that process of asking questions. So thank you for joining me.

Qurat Ul Ain:
Thank you so much, Dr. Warner, for an amazing lecture and update about the conservation project. Thank you again to all the supporters who have made a contribution towards this project. We do have a few questions on the way. We will get started. But an anonymous attendee is asking you, "Why is Portland cement an inappropriate material to use in conservation?"

Nicholas Warner:
Because it contains sulfates that react ... Well, first of all, it's harder than the material that you're working with. And so, generally speaking, one tries to use in conservation a material that is softer than the material next to it that is being conserved because then, if there is a failure in the future of the original material, it will fail in the original material rather than the conserved material. And the idea is that if you make the repair softer, if there's a damage subsequently, it will occur in the repair rather than in the original material. Portland cement, additionally, is a very, very ... In addition to being very, very hard material, also contains sulfates. So should there be any residual water in the vicinity of the stonework, in this case, in the building, the sulfates will be deposited not

only on the surface of the repair, but also in the adjacent stonework. So you would get, typically, a white powdering on the surface, and salts appearing on the surface of blocks that are next to the repaired area. So two reasons: One is hardness, and one is the transfer of salts to nearby stonework.

Qurat Ul Ain:
Right, thank you. Another question by another anonymous attendee, "Theo Gayer-Anderson, related to Gayer-Anderson House Museum in Cairo?"
Nicholas Warner: Yes, Theo is Major R.G. Gayer-Anderson's grandson. And he is an English stone conservator who's worked on many projects in Egypt, and for ARCE particularly, on the conservation of the Bab Zuweila in Cairo, the Fatimid gate of Cairo on the southern side of Cairo in the late 1990's, early 2000's. He's worked with me on the conservation of aspects of the Gayer-Anderson ... Rooms in the Gayer-Anderson Museum, material from the Gayer-Anderson Museum next to the Mosque of ibn Tulun. And in Old Cairo, and in quite a lot of other projects as well. So, yes, he is related.

Qurat Ul Ain:
Great. There was a compliment from Dana. Ariel Finger is asking, "Can you or will you do 3D models of unplaced blocks?"

Nicholas Warner:
Yes. But it may not be part of the initial scanning process. Initially the 3D scanning that we're going to be doing is going to be focused on the building and the surfaces. I think there will be, at some point, a sub-project to deal with the barque shrine, the remnants of the barque shrine walls, the granite walls, some of which is in situ, or may be in situ, and some of which is sitting on the benches outside on the right of the picture that you can see in front of you. So yes, I believe there have been attempts to reconstruct the walls of this structure and the gates of this structure, but undoubtedly we should be doing a 3D modeling. If you're volunteering, I'd be very happy to accept your volunteering.

Qurat Ul Ain:
Great. Susanne Woodhouse is asking, "What happens to the removed, original pavement slabs?"

Nicholas Warner:
Well, it should be said that the original pavement slabs would've probably been removed by two things: Either human interference or natural interference in the form of they would just disintegrate because of water damage. This area was quite wet, and you can see there's a kind of rising tidemark of water all the way around the base of the building, most spectacularly in the pylons, but everywhere you look you can see evidence, historic evidence for the presence of quite a lot of water in the ground which was sucked up into the walls, which is why you have so many losses of the lower levels of the wall. So the blocks themselves would almost certainly have been missing by the 19th century. And when some of the French work was done, they actually found that the soil itself was so salty that was in place of the blocks, that they removed the soil and poured concrete in

there as considered to be an improvement. So that was all removed when ARCE did its paving work within the temple and put in the new pavement, so hopefully there won't be a problem there. So it's two things, historic deterioration and man-made, anthropogenic damage.

Qurat Ul Ain:
Great. Our next question is by Aster, words of encouragement, "Thank you for the presentation. Brilliant. Do you plan, in the future, to work at the Opet temple nearby?"

Nicholas Warner:
No, the Opet temple has already been conserved by the Franco-Egyptian Center at Karnak, and that has fairly recently been completed. And there will be a publication on the Opet temple coming fairly soon, I believe, the architecture and the decoration. So that one has already been done. It's obviously much, much smaller than Khonsu, and it can be ... I think it can be visited at the moment. One of the concerns is that this area is going to experience an increase in the number of visitors in the near future, so it is a priority of the Ministry's that we should work on a site such as this, which has got a very high visitor profile. So that is one of the reasons why, in addition to the value, the obvious cultural value of the building itself, why we have chosen to focus ARCE's attention on this project to complete it.

Qurat Ul Ain:
Great. Sid is asking, "Has the epigraphy work been completed for the whole temple?"

Nicholas Warner:
No. And I'm not sure how soon Dr. Ray Johnson, who is the Director of Chicago House, wishes to return to the subject of completing the epigraphic documentation in Khonsu. There is a lot more to be done. But the Chicago House is also very active at other sites in Luxor, most notably in its sort of flagship project in Medinet Habu, but also in Luxor Temple itself. So in terms of their priorities, I think it's not the highest priority for them. But in terms of our work, I think that if we carry out the conservation of the reliefs, that's no bad thing, and I think it will assist Chicago House in their work, future work.

Qurat Ul Ain:
Very interesting question by an anonymous attendee, "I'm always shocked at the small number of female participants among the ARCE team. What is ARCE doing about this? I noticed there was a female shown when the mention was made of training Egyptian conservators. Is ARCE actively recruiting women?"

Nicholas Warner:
There are ... Obviously, you know I have only highlighted individuals who are going to be running individual programs within the project, so there are many, many Egyptian conservators who are going to be working in this project with us. A lot of them have already been trained on earlier ARCE training projects, and the Head of Conservation of Karnak is a long-term ... Is a friend, and is a long-term graduate from the ARCE Conservation Training School, and there are others like him. We have yet to identify

exactly who is going to be working alongside the lead conservators on different aspects of this project, but undoubtedly there will be a large percentage of women within the ranks of the conservators who will be working on this building. I don't remember the percentages from the previous years, but they are certainly at least 50 percent, if not more, of the conservators are female conservators. And that reflects, I think generally across the board with conservators in Egypt, there are a very, very great number of women conservators who work alongside their male colleagues quite happily. That's actually one of the few areas where I think there's quite a good balance in terms of the sexes, in terms of gender, so I'm not ... We will take the best, and I'm sure the best will include some very, very good women and some very, very good men.

Qurat Ul Ain:
Brilliant. Thank you. Mary's asking, "Was the Khonsu temple or parts of it open to tourists during the years of conservation? Are there sections of it open to tourists now?"

Nicholas Warner:
For many years, this southern part of Karnak has been off-limits to tourists. People have been discouraged from visiting because there's lots of blocks that are lying around in the open, and there are very few guards. So it's been off-limits. And recently, that's changed. It's now within the tourist circuit. Obviously, tourists have got an awful lot to see in Karnak, and their visits are usually prioritized by tour guides, so they will come not from the southern entrance at the moment, although there are plans to reopen the gate that we've just looked at, the Ptolemy, the benefactor gate, and bring people in that way from Luxor Temple. That's obviously quite a big strategic change to patterns of visitation at the site. But actually, given the fact that most tourists have a very limited number of hours and they often see both Karnak Temple and Luxor Temple in the same day, and Karnak Temple is vast and takes 2 hours to see on its own, the main part of the temple, quite a few people just don't have the energy or the time to get down to the other sites which are important in the southern end of the site. So, we'll see. I mean, there in terms of visitation it was not open during most of the time of the ARCE project going out until 2018. It will be partly visitable during the process of our work in the next 5 years. There will be limited access probably into the first court and no further, and we will inform the public about the project as it's going on, so there will be information for visitors about what we're going to be doing there and what we are doing there. I hope that answers the question.

Qurat Ul Ain:
Good, thank you. Melissa is asking, "Can you tell us more about the chapel on the temple roof?"

Nicholas Warner:
Ah. Well, when you come up the staircase, which has not been conserved and whose roof also needs to be conserved, you enter into an area where there was a roofed chapel, I guess, two columns, and a missing roof in that area, decoration, wall reliefs, none of the polychromy survives. None of the polychromy in exposed, external circumstances survives, but it's fair to assume that it was all polychrome decoration on the outside of

the building as well as the inside, so it would've been colorful at one point. So from that point, you do get quite a good view over Karnak looking north, northeast. And it might be possible to allow visitors to actually visit that section of the roof to get an idea of the context around the temple, but it's not essential, and it's only if the Antiquities Department think that it's something that should be encouraged or not. It's quite nice to experience, architecturally, a staircase within a temple, because they are such beautiful elements of these buildings, so it's not a terribly long or arduous staircase to climb. And generally speaking, people are let in there at the moment, in a clandestine way, and so we may as well formalize, I think, this process and make sure that it's a safe visit.

Qurat Ul Ain:
Great. Deborah is asking, "What is the process of removing concrete from the bottom levels of structures?"

Nicholas Warner:
Mechanical. Not pretty. Chisels, hammers, that sort of thing. It's not ... Possibly, we will use an angle grinder to cut up sectors of the surface into manageable pieces. We will have to see when we start work. But we have a good idea, a very good idea, of where the brickwork is. Let's say that the destruction will be highly focused, and it has to be done very carefully because we obviously don't want any of the walls existing stone coursing above the repairs to fall down. So you'd be doing it in sections, probably, leading gaps, taking out meter-by-meter sections and leaving a meter of fill, taking out the next meter, etc., etc., so that when you do your repair, the wall above is always going to be supported.

Qurat Ul Ain:
All right, well, Dr. Warner, we have a question. "Who was the artist who made the colored view of Khonsu, and who was the American artist?"

Nicholas Warner:
The American artist, I think, was on the slide, Edwin Blashfield I think his name was. And the colored view, I'm not sure. I found it on the, actually, the Grand Egyptian Museum website and it was unattributed, so I have to do a bit more research to find that. I don't think there was a view, for example, by the famous artist David Roberts. I don't think he did a view of the interior. I have to check on a lot of the historical representations, still, because they obviously include some significant details sometimes. Even the early photographs, if you look at them not as Orientalist or ruined photographs, but actually in terms of the information that they provide, you'd be amazed how much information there is there. So it's quite a worthwhile process to try and assemble a kind of database of all of the previous imagery of the site.

Qurat Ul Ain:
Our next question is from Juan, "What is your opinion on current travel to Egypt? The State Department has Egypt as red for now, mostly because of COVID."

Nicholas Warner:
Well, the COVID situation here has fluctuated. It was quite bad in Luxor particularly about a month ago, and now there are no COVID cases in Luxor hospitals, for example. There is obviously a great difficulty with finding adequate date for the number of cases that we have in Egypt, but I would say at the moment things are much, much better than they were a couple of months ago, certainly. And I hope that that positive trend ... Negative trend, I should say ... Increases so we have fewer cases in the future. There isn't quite the same level of paranoia about Corona that exists in the West and in Europe ... I mean in America and in Europe ... But it's a very serious problem, and the Egyptian government has tackled it, I think for the most part, in a very, very good way. I've been vaccinated here. It's good.

Qurat Ul Ain:
Dr. Alberto Silvioti is asking, "Will the chapel be open for visitors?"

Nicholas Warner:
Well, I hope so. And I'm very glad you're here, Dr. Alberto, because I'd like to contact you about something completely different about Luxor Temple. Yes, I think we will be keeping a number of the chapels, the most interesting chapels, open to visitors. But I think ... or rotating the number of chapels that are open. There are certain chapels that are very, very badly damaged, and so I suspect that we will not be using them except possibly for displays of material. I think that some of the damaged chapels at the back of the building might be a suitable venue for putting in displays of relief blocks, loose relief blocks or even statuary because those things should be protected, and a deteriorated chapel is quite a good place to protect such things, as well as to interpret them for visitors.

Qurat Ul Ain:
Yeah. So our next question is by Brenna Baker, "How do you support the pylon wall when you replace the earlier repairs?"

Nicholas Warner:
As I hope I shared earlier, you take it out in sections. So you don't remove it all at one go. You take out a meter, and then you leave a meter, and then you take out another meter, and then you go, you make the fills with new sandstone, and then you remove the intervening brick fills and then join the dots, so to speak. That's the theory. Obviously practice sometimes can be rather different.

Qurat Ul Ain:
Great. Our next question is by Kelly, "Is the black color on stone from only the smoke ash effects or also black mold? I noticed that in many other temples with other water damage on sites I've visited in 2019. How is ash and mold cleaned in this situation?"

Nicholas Warner:
In this case, it is soot damage rather than mold. We have taken hydrometer readings to check on the chapels which are the least ventilated of all the spaces and the most

worrisome in terms of the growth of fungal molds. And they are ventilated, but I would say it's slightly borderline in terms of the humidity that would encourage molds to grow. Karnak was the subject of a major dewatering project around the entire wall of the temple which was carried out between, let's say 2005, 2007, another USA project, and that, I think, has had a positive impact on the level of the water table inside the temple. I'm not familiar with the figures, but I think it has improved the situation. In terms of the exact treatment of molds or soot removal, that would depend on the lead conservator for the treatment of those particular areas. I'm not going to specify recipes for those treatments. The anchorman will be the one responsible for that.

Qurat Ul Ain:
Great. Dr. Warner, there are a lot of words of encouragement and gratitude coming your way by a lot of people, but to respect everyone's time I'm just going to quickly glance through them and then also go towards the questions. A next question is, "Why use sandstone from Aswan rather than local materials?"

Nicholas Warner:
Well, I think the Gebel el-Silsila, which is not very far away, is a local material. It's the same material that was used in the temple to start with, and there are no good sandstone quarries in the vicinity. So we would be taking the sandstone from the same quarries that would have been used by the Ancient Egyptians who built the temple. So I'm no ... I agree with the principle entirely of using local materials, and we will be using the local materials, but not necessarily everything comes from next door. It may be some miles away. The lime, for example, that is used in the mortars, the best place for that is Minya, which is to the north of Luxor. So that's where it came from.

Qurat Ul Ain:
Great. So next question, "Thank you very much for an interesting talk. I wonder how the Ancient Egyptians managed the problem of bats and birds inside the big temple, realizing this is a question of more Egyptological one. I suppose, however, that their experience may be useful for modern restoration work."

Nicholas Warner:
Well, I think that they ... The fact that the building would have been used on a much, much more regular basis would mean automatically that animals, such as birds and bats, would not be so present within the building. Bats are a very particular problem, and obviously they roost, and they would be discouraged by people being in close proximity to their roosting places. So if there people there, as there would have been during the life of the temple, there would be lots of people running around. Priests would be going up and down onto the roof, and so I think that that human activity would have actually discouraged any animal activity. The point at which a building becomes a ruin, the balance changes totally. So a few tourists occasionally wandering through is not going to disturb the resident bird population. There is no resident bat population here. We're dealing with bats that just simply fly through the gaps in the roof, and so we'll have to discourage that.

Qurat Ul Ain:
Suzanne is asking, "Assuming the original slabs have been documented in their original position, does this documentation also show lines used as indication of the location of altered placement of columns and also possible graffiti?"

Nicholas Warner:
We will just do the best that we can in terms of physical documentation, three-dimensionally and two-dimensionally, and the interpretation of shifted block positions and things like that will have to be carried out by trained Egyptologist rather than ourselves, but I think as a percentage, it's not a great deal of blocks that have moved. There are blocks that were found in the pavements that obviously were somewhere within the building, and, again, we will document ... They've already been documented, actually, by Chicago House, and they will be reconstructed on paper if nothing else. It's often difficult to actually tell where some of these things go, and there's no point in trying to replace wall relief blocks if you don't know exactly where they were. So it's quite a long process which involves quite a lot of research by Egyptologists, actually.

Qurat Ul Ain:
Thank you, Diana. Thank you, ARCE, for your words of encouragement. Christine is asking, "What variety of materials are used in pointing of the roof of the temple, an ongoing problem over the centuries for buildings?"

Nicholas Warner:
I'm sorry. I didn't hear that.

Qurat Ul Ain:
"What variety of materials are used in pointing of the roof of the temple, an ongoing problem over the centuries for buildings?"

Nicholas Warner:
Well, here, the original mortars were either a lime-gypsum mix or a straightforward lime mix. We would be using a lime-sand mix, and we'd have to see one to three, one to four, one to five. I don't know what the proportion is going to be, but we will be doing some testing. We also include sandstone powder within the mortars, which is really also for the final color. It's significant to have something pretty close to the actual color of the sandstone originals. So in the past I think we've used quite a lot of sandstone powder in the mortars, and that has proved to be successful. So I think we'll be continuing that, but all interventions are going to be tested, obviously, before we actually do any significant volume of work.

Qurat Ul Ain:
Thank you, Howard, from Manchester, England, for your support and kind words. I have actually shared the link on the chat section if you want to look at it. Thanks a lot, and then another question, "What percentage of talatat blocks have been categorized?" I apologize if I butchered the pronunciation.

Nicholas Warner:
Have been ... Well, they've been cataloged, if that's the question. They have been catalogued, and I think that digital catalog will be soon made available in the ARCE website somehow or other via some link through the Archives department. So obviously that's an important percentage. It's not the only amount of talatat blocks that there are on-site, at least talatat blocks on-site. So that's a first step. Dealing with the talatat blocks is a nightmare from many points of view. Have we come to the end of those questions?

Qurat Ul Ain:
I'm sorry?

Nicholas Warner:
How are we doing with the questions?

Qurat Ul Ain:
We have quite a few if you ... To be respectful of time, I can send the questions your way, and then I can share-

Nicholas Warner:
-By all means, carry on, carry on.

Qurat Ul Ain:
Okay. All right. So, "What does the sidelock hair of Khonsu mean?"

Nicholas Warner:
No idea. You ask Egyptological friends. I'm not ... I steer clear of Egyptological stuff.

Qurat Ul Ain:
Audra ...

Nicholas Warner:
Not my department, I'm afraid, no.

Qurat Ul Ain:
Audra also, "Any crypts you restored?"

Nicholas Warner:
Crypts, thank god, no, but we do have the interior staircases of the pylon which you can see have got a couple of ... There's a window. You see a couple of little windows. They go into that space, and I haven't been in there yet. So those are almost like crypts because they've very stony environments, but no, we don't have any crypts.

Qurat Ul Ain:
"Has your work uncovered any unexpected relics offerings or ritual items?"

Nicholas Warner:
No, and I hope not also.

Qurat Ul Ain:
Kelly is asking, "How would an ARCE member go about to volunteer on your site to ... on-site volunteer assistance with the conservation work?"

Nicholas Warner:
This is a ... It's obviously something that we would appreciate very much is to have volunteers, but I'm afraid that volunteers on-site is not so manageable because before we start on-site, we have to submit a list that has to be of people who are going to be working on the project that has to be approved by the Security Forces of Egypt, and so adding people to that is not a possibility. There are other ways I am sure that ARCE would welcome volunteers and even volunteers in Cairo and Egypt, in the Cairo office would also be I'm sure welcomed, but on-site it's very difficult unless it's planned at least a year and a half in advance, which is quite difficult for many people.

Qurat Ul Ain:
Thank you, Richard, for your words of encouragement. Thank you, John, lots of words of encouragement. Amira Mansour is asking, "The walls appear to be plastered over, and I'm assuming that was not original construction, but when was that done? Also, what risk of further flooding damage is there? While heavy rains could cause damage, would it actually stand to a flooding height?"

Nicholas Warner:
The plaster on the walls is original in many, many cases. There are also areas where sandstone was defective for one reason or another during the time of construction and was given a deep plaster fill. So the external appearance of the wall in ancient times would have been a plaster surface on top of sandstone, the plaster surface varying very considerably in thickness from up to 15 centimeters where losses have been repaired or patched to a very, very thin coating, almost a wash, a lime wash on top of the sandstone in other areas. So it is an ancient thing. Obviously, there are many, many areas where modern plaster repairs have been carried out, and that's something else. The other question to do with water damage, I couldn't quite remember what the ... What was it about water damage? Water damage, correct? The question about water damage that Amira had?

Qurat Ul Ain:
Do you want me to repeat that or ...

Nicholas Warner:
The last part of the question related to water damage.

Qurat Ul Ain:
... last part, let me just scroll back down. I'm sorry. I'm moving ... Okay, "While heavy rains could cause damage, would it actually stand to a flooding height?"

Nicholas Warner:
No, but the water would trickle down the walls, and there are places where you can see that inside the temple. So we do have to attend to water penetration as being a major risk factor, so that's what we're going to have to do. We're going to have to try and make sure that the water can get off the roof as well as stop it from going through the roof and through the joints in the walls and the vertical surfaces as well. That's also a major issue.

Qurat Ul Ain:
Speaking of water damage, "Are there groundwater problems at the site?"

Nicholas Warner:
Yes. Again, in the photograph in front of you, you can see camel formed, and that's present because of water in the vicinity, in the near vicinity. It grows wherever there's any humidity. So yes, there is, and as I said, there was an attempt to dewater the whole of the Karnak area, and I'd have to go back and look at the data for the monitoring for that project, which was carried out now quite a long time ago. So there should be quite a lot of data about the success or lack of success for that project. There may be now localized issues whereas before there might have been a general problem affecting the whole temple. Now there might be pockets of humidity that survive. So it's something that we have to bear in mind, and it is something that we will ... We are addressing in the program of repairs, so yes.

Qurat Ul Ain:
Arlene had some words of sympathy for passing of Danny Royd, so I just wanted to pass it along your way, Dr. Warner, and Brett is asking, "Why is the Khonsu temple is large compared to other possibly much more important structures at Karnak?"

Nicholas Warner:
Why is it what?

Qurat Ul Ain:
"Why is it large compared to other possibly much more important structures at Karnak?"

Nicholas Warner:
It's not large compared to other large ... other structures at Karnak. I think it was ... I don't think I said anything about its relative size. I've always thought of this temple as being quite a petite temple in the Egyptian sort of size states of temples. I've never thought of it as being a very large temple. However, it is a remarkably complete temple, and the program, the decoration inside is pretty complete, and all of its bits are there. So I think it's relatively well preserved, but I certainly don't think it's a very large temple, no.

Qurat Ul Ain:
Thank you, Diane.

Nicholas Warner:
It's just about manageable. It's a nice manageable sized temple I think. Anything bigger becomes very, very difficult to deal with in a lifespan of one individual.

Qurat Ul Ain:
Thank you, Diane. Another question, "Have you noticed any conservation or restoration done by Ancient Egyptians themselves?"

Nicholas Warner:
Yes. The plaster fills are an example. As they went, they had to deal with defects in the materials, and it's quite interesting to see how they did that, yes.

Qurat Ul Ain:
So last couple questions, Dr. Warner, thank you so much for being with us today. "Is it common to use three-dimensional scanning and computer all to determine how to reconstruct structures from blocks to determine placement when other documentation is no longer available?"

Nicholas Warner:
Two aspects I think there. One, yes, I think 3D scanning is the fastest and most accurate method of recording that we have available today, and the detail is remarkable, and it's certainly something that I would do with any project, no matter what the scale was because the value of it is incalculable. In terms of 3D modeling, that's something slightly different. Obviously, there will be a 3D model of the temple that will be made as a result of the scanning, which is a result itself of three different processes so topographic survey using a field light plus scanning plus high-resolution photography, which is then mapped onto a wire-frame model. So it's a tripartite kind of technological method. Smaller blocks, individual blocks, if they were to be reassembled into, for example, a wall or in adjacency to other blocks if it's a statue, yes, you can do it by individually scanning the pieces and then doing so on a computer. I'm not an expert in that, but I know people who would be very good at doing that.

Qurat Ul Ain:
Someone earlier asked about what the sidelock indicates. Solon, actually thank you so much for answering those questions. If you are still around, it means ... Sidelock indicates that he is a youth. So I hope that's helpful. Anthony is asking, "What technique was used for waterproofing the roof slab by the Ancient Egyptians themselves?"

Nicholas Warner:
They used gutters, and they used rainwater spouts. The sandstone slabs were laid to fall, which is that they had a slight inclination which led to perhaps in many cases small internal gullies that then led to rainwater spouts, stone rainwater spouts. In many cases ... Well, the surface has disintegrated in many cases, but also due to substance, sometimes you have issues with where the water would go nowadays. So you may have to rectify that in a more clever way, but yes, they did plan for rain certainly.

Qurat Ul Ain:
Rob Sullivan, thank you for being here and your kind words. Last two questions, Dr. Warner, Asta is asking, "I wonder about small doors we see on the wall in the current photo. I remember entering into the temple through these doors. Are they original? I believe the main entrance was through the pylon. Thank you."

Nicholas Warner:
Yes, the pylon is the main entrance. There are two side doors. You see one in the center of this slide, and there's one matching from the other side of the temple, on the west side of the temple, and I'm not sure. I don't know. I'd have to ... Because so much of the decoration is missing, I'm not sure if they were original. They may have been put in during the long, long lifespan of the temple. As I said, there's a 1,000 years difference between the Opet Temple, for example, and Khonsu, and the side door may relate to access next to Opet as well. So I don't know the answer to that question, honestly.

Qurat Ul Ain:
Windmill91, "I was a visitor there in November 2006. Do you want my pictures? In looking at them, I saw several places where I could not climb up to the place into the chapel, but I'm glad that you are going to make sure there's better visitor ingress. It was a lovely introduction for the temple."

Nicholas Warner:
I'm glad you enjoyed the visit, and I encourage you to come back and visit again in about 5 years time.

Qurat Ul Ain:
Dr. Warner, that was the end. I don't think there are anymore questions. Thank you, everyone, for being here. Dr. Warner, this was absolutely fantastic. Thank you.

Nicholas Warner:
Thank you.

Qurat Ul Ain:
Just to give you all a quick update on where we are on the fundraising, we so far have raised $8,000 of our 11,500 goal for the sandstone which is incredible. Thank you, everyone who supported. We will be including a stretch goal because our donor base has been so generous and kind, and we will be including a campaign about raising funds for the 3D scanning as well, and that would ... You would hear more about that in coming future, and if you have any questions, please reach out to us. We will be sure to keep you in the loop about the updates. Dr. Warner, thank you again. I am so glad that you were able to take the time out today.

Nicholas Warner:
Thank you very much. Bye-bye, everybody.

Qurat Ul Ain:
Bye, everyone. Have a wonderful rest of your weekend.

Nicholas Warner:
Thank you.