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>> I am delighted to introduce our next speaker, Andrew Weislogel. Who is the Seymour R. Askin, Jr. 47 curator of earlier European and American art at the Herbert F. Johnson Museum of Art at Cornell University, in Ithaca, New York. He holds a BA in Medieval Studies from Hamilton College, and an MA and PhD in Italian and French Renaissance art from Cornell. He has organized numerous exhibitions at the Johnson, including Etchings by Rembrandt from the collection of S. William Pelletier in 2004. The New and Unknown World: Exploration and Trade in the Dutch Golden Age from 2011. And the catalogue from his most recent exhibition is called Lines of Inquiry: Learning from Rembrandt's Etchings. It won the College Art Association's Alfred H. Barr prize for distinction in museum scholarship. We do have a few copies of that catalogue here, along with books by our other speakers. And they've all asked me to inform you that they really don't want to take all those copies back home again. [laughter] So I hope you will find them of interest. Doctor Weislogel is going to talk to us today about the project that is related to that recent exhibition. Its called, he has a longstanding interest in technical art history and has participated in dendrochronological dating and X-ray fluorescence mapping of paintings using Cornell's synchrotron. And I don't even know what that is so you'll have to tell us. It sounds extremely impressive, and it is. This is really what's brilliant about this, is that it's a marriage of science and art. And the WIRE Project, which he's involved with stands for Watermark Identification in Rembrandt's Etchings. Its an innovative, interdisciplinary project that brings together students from art history and computer science designed to expand access to knowledge about Rembrandt's printmaking and our understanding of his techniques as a printmaker. So we will hear about that now, Doctor Weislogel.

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[Applause]

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>> Thank you, Stephanie for that wonderful introduction and for the invitation. Its such a pleasure to be with you all this afternoon. I also want to extend my thanks to Max Valsamas too, for his wonderful organizational efforts. And all the lovely fellow scholars that we get to spend the morning with today before the program began, in the beautiful and bountiful exhibition here at the Agnes. Today I'd like to cover the following as time permits. So its good that we've all been re-caffeinated. Hold onto your seats. I'd like to start with some papermaking and watermarks background of course. Then introduce the WIRE Project at Cornell and some of its goals and progress. Share some examples of watermark discoveries encountered along the way. Briefly touch on watermarks as they relate specifically to Rembrandt's Leiden period since that's what we're about today. And discuss some future directions for the project. And hopefully I can fit that all into the next 25 minutes. So.

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It all starts and ends with paper. As my colleagues here all well know, every sheet of paper made in Europe in Rembrandt's time regardless of its ultimate use comes from one of these. A paper mould and the deckle that keeps the sheet rectangular when the mould is dipped into the vat. Here we see the three main components of every paper mould in Europe at this time. The laid wires running horizontally. The chain wires running vertically. And the watermark sewn with fine wire to the mould. At right you see a freshly couched sheet of paper from this modern mould. You can see the indentation or thin area left on the paper by the watermark wire, as well as the chain and laid lines there before the sheet of paper actually dries. Here's an example of a more complex post-torn type watermark, probably from the 19th century, again sewn to a mould. So just a few words about the paper-making process. Because this is important to understanding Rembrandt's process and how we date his prints. So let's see. The first important thing to know is that the paper-making process in Europe at this time consists of two rotating moulds. And the watermarks on these rotating moulds that rotate through the vat are as identical as possible. But of course, they're made by humans and so there are slight variation between them. They're not quite identical and so we call those twin marks. And every sheet of paper that comes from the batch has one of those two marks. And every paper, every print that we find printed on a sheet from that batch is therefore datable to that same batch. There's a three person team involved in making paper. There's the vatman, who is in charge of the operation and dips the mould. There's the coucher, who turns the mould inverted and inverts the fresh sheet of paper onto a felt. And then there's the layer, who takes the moist sheets out from between the felts, stacks them for pressing. And the whole thing rotates over the course of a workday. And artisans working this way could turn out about 1,000 sheets in a day. So it was a really quite efficient process. Here is a sheet of probably 18th century paper made for the Dutch market. We can tell it was made for the Dutch market because it has a pro patria watermark which shows the Maid of Dordrecht on the right there in a palisade enclosure. It also features a countermark, a secondary watermark usually on the left side of the mould that served as a further identifier for the paper. Now if we knock that photo down to grayscale so you can see it a little bit better, the paper characteristics. We can talk a little bit about what happens when prints are made from a sheet of paper like this. And you actually have to cut it up in terms of how we read the watermarks. I think you can see that if you print four prints in a quarto format on a sheet like this, you can still see the watermark underneath there, hopefully. The upper left part of the sheet won't get any identifying characteristic at all except the chain lines. The bottom left will get the countermark until the margins of the print are trimmed. And then that's gone. And the two on the right will each get a partial watermark. And this is important to keep in mind because when we look at Rembrandt's prints we actually in practice, only find a portion of

a watermark on about a third, 1 out of every 3 Rembrandt watermarks that we look at. So there's a lot of information that gets lost in the process. Let's see. So just a little bit of background on our project, that we've been working at Cornell for the past four years roughly. This is the 3-volume set by Erik Hinterding at the Rijksmuseum who is the acknowledged expert on Rembrandt watermarks, which provides the basis for our project. And he is in turn drawing on scholarship by legends such as Allan Stevenson, Nancy Ash, Shelley Fletcher and others. Here are some of the things that watermarks can tell us. We can learn where the paper was made. All of Rembrandt's paper was made outside the Dutch Republic and imported in. In what year a specific impression was printed. When and how rapidly Rembrandt made state changes or plate changes to his plates to affect the visual of the image. Which plates he was printing at the same time, and therefore which older plates he was reprinting as he made new ones. Which is important as well. And of course, what most people want to know, whether a print was made during Rembrandt's lifetime or not. Some assumptions about the scholarship that we need to carry going forward. One, paper was expensive. And so Rembrandt usually bought small batches and used them up as quickly as he could to recoup his investment. What that means is you can date each batch to roughly a particular year. Or at least many batches are datable to a particular year, period and time. And that also means that the latest date of a plate printed on a given paper batch dates all the other impressions of other plates found on that same paper. It's a last date, dates the batch kind of phenomenon. So let's look at a couple of watermarks here ok. I think you can pretty easily tell these apart. But you can also tell that they're of the same type. They're both a double-headed eagle type. It's a type of paper made in Switzerland. Now how about these? Those are a little harder to tell apart, yes? You could probably do it but you'd have to come up with a descriptive language to do so, yes? Well, in this case you don't have to worry too much because these are twin marks. They're from the same batch of paper. So anything appearing on this paper is going to be datable to the same time. However, if we have two like this these look even almost more identical than the previous two, but these are not twin marks.

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The double-headed eagle watermark on the left is found on prints dated to 1637, while the one on the right is found on prints dated to 1645. So if you mix them up, you miss dating the impression of the print that you're looking by a range of eight years. And that's not really acceptable. So part of what our project is designed to do is to combat these types of mixups.

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So the basic goal, the current goal of the WIRE Project is to create an online interface that allows people to upload their own watermark images and answer a series of yes or no questions to get to the correct match in the existing Rembrandt taxonomy. This is student

project that we've been working on for a few. We've taught eight semesters of research seminars to build this tree. And I'm happy to say the decision tree is nearly complete. And so we're in the testing phase of that now. So I wanted to show you a little bit of what that looks like by taking a test example. So here is a Strasbourg bend watermark, so-called for the bend or the diagonal stripe that we see on the shield. When you use our interface, you'll come to this page on the website. You'll click the centre button and you'll be offered an opportunity to upload your own watermark image. When you do so, then you'll be taken to a page where there are roughly 50 odd types of Rembrandt watermarks that are known appear in a scrolling, up and down sort of configuration. And you can choose the correct watermark type. Once you've chosen the correct type, you can look for the correct subvariant, by answering a series of yes or no questions here. Such as, are there initials below the shield? In this case, you can see that there are. And other questions continue. If you get stuck, you can have access to this image which reminds you what the names of the parts of the watermark are called. And when you get to the end, you can see you're at the arrival page where a match is reached. And in future, information about other impressions on this same paper will appear right here on the site. And if your watermark doesn't match at this point you can click the little oval yellow button at the bottom, and it sends me an email. [laughter] So I'll be looking out for those. This is the actual structural diagram that lives behind the scenes of the website. This is the pattern of yes or no questions that leads to every subvariant of the Strasbourg bend watermark. And this is a small branch. Some of our branches have upwards of 60 different types in them. So this is a lot of intensive work that the students have put in over a series of semesters. And what we can learn at the end of the trail here is all the different prints that appear on a given batch of paper. And not only that, but as I was mentioning earlier, you can see which of those is the latest plate on the batch. And therefore when the earlier plates were being reprinted. In this case it's the portrait of Jan Cornelis Sylvius, 1646. So you can see in this case, there are some Leiden era prints that Rembrandt was reprinting onto the same batch from his new post in Amsterdam in 1646. As we've been working on this project, we have been sort of slowly building a consortium of participating institutions who have showed us their Rembrandt prints. And we've identified their watermarks and who are helping us test the interface as we go forward. And that's the sort of crowdsourcing aspect that you saw in my title at the beginning. Its been immensely rewarding to build these relationships along the way. And we've benefitted from watermark data as well, such as these radiographs that have come to us from the Cleveland Museum of Art which I'll talk about in just a moment.

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So I'd like to share a few discoveries that the project has made. And these fall into three basic types. The first type is when you see watermark you would expect to find on a certain print. And that's

called reconstitution edition. So the 1647 portrait of Ephraim Bonus, for example. Erik Hinterding had found eight on this particular paper with a basilisk watermark. The WIRE Project has uncovered an additional five. So we're getting a sense of just how big this particular edition of this portrait print was. Bigger than we thought. Also, we're taking a similar census of previously unexamined impressions of Rembrandt's famous portrait of his respected friend, the silversmith Jan Lutma from 1656. This is a fascinating print from many standpoints. But there are questions around the print's production, in terms of Rembrandt's financial situation at the time. He declared bankruptcy as we know, in July of 1656. And around his role with later impressions of the print. And the possible role of the Lutma family members in the print's later production. So a WIRE watermark discovery got us thinking about this. So the first date of the print you can see it shows Lutma seated in front of a blank wall. The second state includes a worked-up window embrasure, which completely transforms the print. And again makes it saleable again to presumably to the same public once again. And then in the third state, and its very difficult to see. See if you can pick it out. There is an inscription that says F Lutma X, which stands for Francois Lutma, the sitter's son as publisher. And this has caused some confusion and some questions about the third state of the print. There seems to have been some kind of publishing arrangement made here. Although this happened too with other Rembrandt plates represented by Barendrecht and Danckerts as we know. At this point, one would normally assume Rembrandt was no longer involved in the printing of these impressions. So however, when you discover watermark matches like this of paper batches. One, these are both in Cleveland. One on the first state of the print, one on the third state of the print that I just mentioned. We believe this is the same batch of paper. So this adds to the existing scholarship of three other watermarks found on at least the first and third states of this print. And sometimes all three, indicating that the changes to the plate for each state were made relatively quickly within the span of one batch of paper, in each case before it ran out. Its also important because as we've just said, the third state is supposedly published not by Rembrandt, but by Lutma. So technically that should be on a different paper but its not. It appears on the same paper as the first two states. So this situation raises questions about Rembrandt's relationship with the Lutma family. And whether Rembrandt was still involved with printing this plate even after a new publishing arrangement seems to have been made. So the second type of watermarks are, come to us via another student discovery from the project. And that is finding known watermarks on new prints. Here we have Christ Presented to the People the oblong plate, 1655. The impression in the Morgan Library and Museum which features a Strasbourg lily watermark, which is never before seen on this print. The only other print found on this paper are several impressions of Rembrandt's famous Hundred Guilder print from 1648. So the Morgan's impression of Christ Presented on the Strasbourg lily paper, helps us first to date these Hundred Guilder impressions

appearing on the same paper to after 1655 for sure. And this is also interesting because watermark evidence shows that sometime around 1654, Rembrandt stopped making reprints from most of his earlier plates, this one included. Which suggests that he had somehow lost control of his early stock of plates, probably having to do with his financial, growing financial insolvency at the time.

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So does this watermark correspondence therefore mean that the Hundred Guilder print plate was still in Rembrandt's possession in 1655, when Christ Presented to the People was being printed? We don't know. This is an open question. But what it does mean is that certainly these two prints were printed by somebody at the same time, and that was not previously known. The third type, is new watermarks that have never been seen before on any print, any of Rembrandt's prints. And so here is another example of an impression of Christ Healing the Sick, the Hundred Guilder print. Which is clearly a posthumous impression. But it still can shed light on the history of a plate after Rembrandt's involvement with it. And I'll tell you how. This as I mentioned, is quite worn impression. But transmitted light shows an Arms of Amsterdam watermark. This paper is produced in the southwest of France, where paper mills were owned by Dutch merchants. And so they marketed a lot of paper still to the Dutch Republic at this time, with this Arms of Amsterdam watermark. So first this gives us sort of a snapshot in time of the plate's condition of around 1745. You can see the date at the bottom of the watermark. But its also a further link in the plate's provenance that the Hundred Guilder print plate was probably still being printed in the Netherlands at this time. Which we surmise, but this sort of gives us a further evidence for that.

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So let's move briefly to some Leiden prints by Rembrandt. As the exhibition catalogue rightly points out, Rembrandt produced about a third of his etch plates while still in or associated with his hometown. However, so many of these were small plates. The loonie is included for scale. [laughter] And surviving such few impressions overall, at least before 1631. That its difficult to glean a lot of useful watermark information from these early prints. However, some information from some of the larger impressions of his larger plates at that time can be sort of put into the mix here. Scholars of course, have long wondered about Rembrandt's beginnings as an etcher in Leiden. And for example, the discussion continues surrounding a possible personal or professional artistic relationship between Rembrandt and Jan van Vliet, the established Leiden printmaker. Here we see an impression of Rembrandt's Good Samaritan in the collection of the Met. The first state, where the horse's tail is still not filled in yet. I think you can see that. Hinterding tells us that the Arms of Burgundy and Austria watermark on this print is dateable to 1631 and 32. And appears on 11 different Rembrandt prints with plate dates from 1630 to 1632. Likewise, 6 prints from 1631 by Jan van Vliet

also appear on the same paper. Watermarks therefore can lend credence to the idea of Rembrandt and van Vliet sharing workshop space or at least sharing paper, or at least having known each other. But what if Rembrandt and van Vliet independently used the same paper supplier or the same printer? That's a possibility. So I think its worth citing Stephanie's arguments in the catalogue for the present exhibition. First, Leiden is not a very big place. The likelihood of a collaboration has a sort of common sense feel to it. Second, did Rembrandt have access to his own press? He was after all living at home in his parent's attic. And with respect to watermark matches, I would further add that from my experience studying watermarks, the likelihood of this watermark overlap being coincidental is quite small indeed. And its also not the only example of such an overlap. So this is again, still an open question. But one that watermarks can continue to shed light on.

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Somebody give me a time. Where are we at?

>> Five minutes.

>> Five minutes. Ok.

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Of course, we see examples of Rembrandt's Leiden prints appearing as later reprints as we've already discussed, in Amsterdam. And many of these pointedly date from that period that I was talking about, the early 1650s when he seems to have had been printing more prints because of his growing financial difficulties. So for example, here The Small Lion Hunt with Two Lions which appears on this Foolscap watermark which is dateable to around 1650. Or The Rat Catcher, which is a subject that Jan van Vliet also treated. And impressions made in Leiden of this print by Rembrandt also appear on the same paper as Jan van Vliet's impressions. But this one is later. This is probably from around 1653 in Amsterdam. Both of these impressions in our collection. So just to wrap up, I'd like to sort of you know, give you a sense of points of departure for further avenues for this research. There are a lot of implications. And one is the possibility of branching out from Rembrandt to those in his circle. So Ferdinand Bol is a good candidate, for his own decision tree treatment if you will, as one of the few Rembrandt pupils who had mastery and productive success of the etching technique. The hope here is that we might find overlap between Bol's prints and Rembrandt's. And as a matter of fact, this has already begun in some sense. With print drawing matches like this one between the same watermark appearing, the same paper batch being used to create Bol's drawing from the early 1650s for the Amsterdam Town Hall Commission and Rembrandt's famous print of The Three Crosses being printed roughly simultaneously in about 1653. So the question here is, did they happen to buy the same paper? Were they still friendly at this time long after Bol had left Rembrandt's workshop? What are the implications here, what are the possibilities? And there are more matches than just this one as well. We also find drawing,

drawing matches, same watermark. These are a little harder to see. These are Arms of Amsterdam watermarks that appear in respectively, on the left on a famous drawing of Rembrandt's from the Ashmolean in Oxford, of the late 1650s. and a Phillips Koninck landscape in the Fondation Custodia in Paris. So what does this mean? Houbraken cites Koninck as a Rembrandt pupil but there's no documentary proof of that, that I'm aware of. So again, this kind of match might imply a relationship between those two artists that could be further explored. And so, I think I'm probably. I'm ok? Ok. Thank you very much. Max, you're great. And all of you, thank you. So yes, the last bit is about matching watermarks without, I'm sorry, matching mould mates without watermarks through chain line matching. My colleague Rick Johnson, who some of you know, has developed with his colleagues a method of marking chain lines on radiographs of papers. So that they can be fed into a computer and matches can turn up. And this is an example of that. The red and the blue lines work together to show a match. And this is in fact a match between two prints in the Morgan Library and Museum. This print, which is formally attributed to Rembrandt now given to his workshop. And a print decidedly by Rembrandt, the Medea print of 1648. And you can see how those radiographs overlap and the chain lines match. And in this case, we can confirm that the chain lines match because both of them have the same watermark as well. As a matter of fact, this is one of the examples that got our project started. So they refined this now. The software is now improved such that you can not only mark chain lines on an existing sample, but it will automatically calculate the ratios of the chain line spacing. So that allows us to make more matches, such as these mould mates here at the top of the page. And also, to determine mathematical matches between the relative placement of watermarks relative to chain lines on those sheets. So the last thing I'll mention, and I thank you for your indulgence, is a new collaboration that we're working on right now. That's supposed to be a white slide but nevermind. That we've just partnered with Erik Hinterding's publisher, the publisher of the New Hollstein series Sound and Vision publishers in the Netherlands. So we'll be consulting and collaborating with them on a project they're developing which is called the Virtual Print Room, an open digital platform for the sharing of printmaking research. So more to come on that. And if you're in Amsterdam and you haven't seen this exhibition yet, check out Rembrandt Laboratory. We were asked in the spring to contribute a version of the WIRE decision tree to this exhibition on technical approaches to studying the master. And if you go, you can see our kiosk there. So up until February 20th, that's on view there. So I thank you very much for your indulgence. And again, thanks.

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