

## **Andrew Hershberger—Photographic Historian**

Photographic historian at the School of Art at Bowling Green State University, Andrew Hershberger uses his expertise to discuss the history of camera obscura. Hershberger begins the interview by talking about the upcoming 2024 eclipse, and his personal experiences with these phenomena in the past. The interview continues with discussions on how to observe the eclipses safely, for yourself and technology, and concludes with how science has evolved with understanding eclipses.

Interviewee: Andrew Hershberger (AH)

Interviewers: Sam Davis (SD), Oluwatimilehin Fatoki (OF), Trenton Nelson (TN)

Date: September 29, 2023

Location: Zoom in Kuhlin Center, Bowling Green State University

[START OF INTERVIEW]

[Note: Some tangential discussion from the audio file has been omitted]

**SD:** [00:00:06] Okay, awesome. So my name is Sam Davis. I am a second-year history grad student at BGSU.

**OF:** [0:00:14] My name is Oluwatimilehin Fatoki, A second year graduate student at BGSU.

[Note: Some tangential discussion from the audio file has been omitted]

**SD:** [00:00:29] Awesome. Thank you. Okay. So if you could just give us a brief introduction as to who you are and what you do?

**AH:** [00:00:37] Yes. It's a pleasure to be here with you today. My name is Andrew Hershberger. I am a photographic historian. I teach in the School of Art at BGSU. And one of the very interesting things in my opinion about the history of photography is that cameras predate photography by a lot. And many people don't know that. And so today, we're going to talk a little bit about why that is and how that came to be. So I'm really looking forward to our conversation.

**SD:** [00:01:07] Awesome. Thank you so much.

**OF:** [00:01:09] Thank you so much. So we're going to be starting with the first question, which was, what are you going to do on the eclipse of April 8? Will you be bringing your camera?

**AH:** [00:01:18] Actually, I probably won't be trying to make photographs in that moment. Because I don't have the right equipment actually do that myself. As a photographic historian, I am a photographer. And I did bring an old camera with me, I really like old cameras. And so if the conversation directs us in that way, I will bring up this old camera. But most of the cameras that I own are not designed to photograph the sun even during an eclipse. And the lenses that I have are definitely not the best kind of lenses for that. So I will be observing, but only as a person, you know, using my own abilities. And probably I'll be using a camera obscura, actually to make it safe. And I'll talk about that too. more as we get into the conversation.

**SD:** [00:02:07] Awesome. Thank you. Do you have any memorable experiences with previous eclipses?

**AH:** [00:02:12] I do, indeed. And I found the date of the one that really stands out to me in August of 2017. So pretty recently, there was a partial eclipse of the sun here in Ohio. And it happened on August 21, which was the first day of school in fall of 20, excuse me, 2017. And I vividly remember that Eclipse because I was outside on the first day of school with a group of photography students that were not my own students, they were in a photography class. My history of photography class didn't start till the next day. But I joined with a photography class. So there were a bunch of students outside the school of art. And the phenomenon of this partial eclipse in and of itself was amazing, of course, to see with the proper protective equipment on my eyes. But the thing that absolutely blew me away, was the view underneath trees that were around us. And this is a really cool phenomenon. So I highly recommend anyone during an eclipse. Look below trees that happened to be around you. And you will see an image of the partial eclipse of the sun projected onto the ground hundreds and thousands of times underneath trees, and I'm glad to see you reacting.

**SD:** [00:03:30] That's just amazing!

**AH:** [00:03:31] It is unbelievably cool. And this phenomenon was known for a very long time. People like Euclid and Aristotle write about this phenomenon in the ancient world. And so this spectacular, in my opinion, view of the image of the Sun projected over and over and over again, underneath trees is something that's been known by, you know, a lot of people for a long time, but I had never perceived it myself until 2017. And I was like, Oh my God, that's what they were writing about. And it's such an interesting phenomenon. So I have a lot to say on that topic. And I think we'll probably get into that more later on.

**SD:** [00:04:07] That's so interesting. You would never think to look down during an eclipse.

[Note: Some tangential discussion from the audio file has been omitted]

**OF:** [00:04:16] Thank you Dr. Andrew, you mentioned something the other time about the camera obscura?

**AH:** [00:04:21] Yes.

**OF:** [00:04:22] Which is both the precursor of the camera and a key way to observe eclipse. So can you talk about the shared history of photography and the observation of eclipse?

**AH:** [00:04:31] Okay, yeah, great question. And I brought with me some books that I think I'm going to use to help me answer that question. Again, I teach the history of photography. And it's been a pleasure actually to learn this history and I'm still a student. In my own mind. I'm still learning there's a lot to know. And one of the most fascinating things is definitely that. Cameras predate photography by a lot. And maybe go on All the way back to ancient times because the word camera actually literally means room. That's what the word camera means originally is

room. So we are in a camera. Right now, we're in a room. It's not designed to make images inside this room were designed, you know, this room was designed to capture audio very well, and hopefully it is. But if you have a room and many people have rooms, you can see images inside of it if you have a small hole that allows light in to the room. And ideally, the hole will be facing the outside. So in this room, we're kind of inside a room inside of a room, so it'd be hard to do it in this room. But if we're in a room that has a wall that faces the outside, and if we were to drill a little hole in the wall, like maybe a eighth of an inch diameter hole, you would see inside the room, as long as every other source of light is blocked, so the room has to be totally dark. Other than this one little hole, you will see whatever is outside projected inside the room, it'll be upside down and reverse left to right. Because the light that's up high outside will come in through that hole and go down low. So the sky will be seen, and you will see the clouds on the floor. And you'll see other things that are up high on the floor, you'll see what's low, like people walking on the sidewalk outside, their image will be projected on the ceiling, you will see people walking across the ceiling of your room, it's such a fascinating phenomenon. And that same phenomenon is happening inside of all of our eyes to the image that's on the back of our retina is upside down and reverse left to right. Because the light that's coming in from the right goes into the left, and the light on the left comes into my eye and goes into the right, and low becomes high, high becomes low. So the image is always reversed upside down and backwards. And so all of us, our brains are flipping these images right side up and correcting them left to right and then combining the two images in our eyes. So every camera, including this really nice old camera that I have from the late 1800s, it's basically a room. And inside the room, you've got this little opening, which is now the lens, but you don't really need a lens, you just need a room. And this box camera shows that the rooms just keep getting smaller and smaller and smaller. And now we can fit the room in our pocket and our cell phone. But cell phones still have a little room inside of them where the light comes in and strikes a CCD. And that CCD is turning the image right side up and correcting it left to right before we look at it on the back of our phone. So, in any case, the history of photography begins, arguably, with the first cameras, which were basically rooms. And some scholars have even argued that maybe caves were the first cameras, because light sometimes comes in through those caves through small openings. And it will create an image if it's coming through a small enough opening. And that's why by the way, Aristotle and Euclid and an Arab philosopher named Al Hasan all the way back in the year 1037, I think, Al Hassan sees this phenomenon underneath trees. And it's happening because the sun is so bright, even during an eclipse, that just having like leaves that create a small opening. So sun comes through all these leaves, and there's little openings. And all those little openings act like that hole in the wall. And that's why the image of the Sun is projected onto the ground underneath trees is because there's all these little like apertures in a sense, and you don't need a dark room around the tree in order for it to work. Because the sun is so bright, even when it's being eclipsed. It's almost as if you don't care that there are no walls blocking the rest of the light. Because the image of the sun is so intense. You can see it without, you know, blocking the rest of the light. So that's kind of a long answer to your question. But the history of photography goes all the way back to you know, very, very early times if we connect it to the history of cameras, which again are rooms originally.

**SD:** [00:09:17] That is so fascinating.

**AH:** [00:09:19] Thank you, I'm glad to be here.

**SD:** [00:09:20] Yeah, I had no idea that that was conceptually how that worked. That is so fascinating. So I think we're through all of our major questions. So maybe we'll get into a little more detail of like the sub questions. Um, okay, what do we have? Timmy, you're typing right now. He eliminated a couple of the questions so I'm trying to figure out what we should get into next. What do you think we're? Because did he strike through these last? He's got rid of these last three questions. I'm so sorry about this.

**AH:** [00:10:11] Yeah, I will defer to people like Andy Leighton about like how to photograph and Eclipse today is that you don't, wanna do that unless you have the right equipment.

**SD:** [00:10:21] Has the science really evolved on that over time?

**AH:** [00:10:42] It's dangerous. You know, you could damage your own eyes, you can damage your equipment too, aiming it directly in the sun.

**SD:** [00:10:31] So equipment can be damaged by?

**AH:** [00:10:33] Absolutely, yeah. The sun is very bright. Yeah. During an eclipse.

**SD:** [00:10:39] Do we have the technology to photograph this stuff?

**AH:** [00:10:41] Yes, people like Andy Leighton can tell you how to do it for sure. No doubt about that. You would just need probably a very, very dark neutral density filter. And I mean, one that blocks out basically all light, essentially, and allows in though the intensity of the sun. And actually, this brings up a really cool point in my head that the reason why I think Camera Obscura's we're first noticed, you know, this phenomenon, like if I'm in a room 1000s of years ago, and it happens to have an imperfection, like a little hole in the wall. And I start to notice, like, wow, I'm seeing images of people, you know, walking outside on the ceiling of my room. I'm going to pay attention to that. And I'm going to figure out, like, why is this happening? Or at least I'm going to note it and write it down maybe like Al Hassan and other people did. And Aristotle and so on. You know, he was even outside seeing this phenomenon. I think why Camera Obscura is were so helpful to people early on, was so that they could safely view a an eclipse, or they could safely look at the sun. And one of these books that I brought with me has an image. And I know that we're being recorded here on audio, so you can't see it on audio. But here's an early drawing of a room, a camera that was being used specifically to look at a solar eclipse. And so this was a Dutch philosopher, named Gemma Frisius, who made the drawing. And it dates from 1544. So back in January 24 of 1544. In the Netherlands, there was an eclipse of the sun. And he made a diagram of how that was viewed. And I think it's partly because looking at the sun even during Eclipse will damage your eyes. And I have no doubt that was the case back in 1544, too. And so it is really important for viewers and listeners to know that you don't want to look at the Eclipse without the proper gear. And you need to be very careful, still today, with buying the glasses that are sold, because sadly, many places will sell you glasses that are not actually properly safe for your eyes. So make sure you go to like the National astronomy websites that are telling you these are the accurate sources where you can buy correct, you know, not corrective glasses, but protective glasses, that will protect your eyes enough because if you

don't get that kind, you can actually damage your eyes pretty badly by observing the sun. And so these rooms allow you to look at the eclipse on the wall inside your room rather than look at it directly. And it is perfectly safe without any protective gear on if you're looking at the the solar eclipse inside a camera obscura that will be safe for you to do so I think that's one of the reasons, pardon me, why these early cameras were first of all noticed, and secondly useful is because they would allow people to look at things like intensely bright things like the sun without damaging their eyes permanently. Yeah. Very good benefit.

[Note: Some tangential discussion from the audio file has been omitted]

**OF:** [00:12:46] Because I think I had an experience with eclipse, I think maybe 2017. I'm not so sure. Well, I looked at it with my, you know, eyes, but I wasn't very sure. You know, there was no information prior to that, that you can't just look at the sun during the eclipse. And everyone I was, when I was doing my secondary school, call it secondary school, high school over here, and we were all looking at the sky with our bare eyes. And probably because it's a partial eclipse, so not an total. Well, now it's just important for everybody to know that you can't just look at, you know, the Eclipse directly.

[Note: Some tangential discussion from the audio file has been omitted]

**AH:** [00:14:37] Yes, it's definitely a dangerous thing to do. Yeah, you can permanently damage your eyes, looking at the Eclipse and hopefully yours are okay.

**SD:** [00:14:45] Well he has glasses now. Can't be too sure. You mentioned that some Arab scholars were really important in the development of, you know, Eclipse science. I was wondering if you could speak more to maybe how multiple different cultures were involved in this history?

**AH:** [00:15:05] Well, yeah, I think it could be the case that, you know, it's going to be the case that all cultures have rooms, and be my assumption of some kind. And so you know, if you have a space that is relatively enclosed, or maybe totally enclosed, and you have imperfections in that space, you're going to see light, light will do this. And by the way, I love to tell my students this, you all probably, you know, have rooms that you live in, and you can make a camera obscura in your apartment in your dorm in your home, wherever it is, all you have to do is darken the room completely, and then create a little hole, it doesn't have to be a lens, you don't need a lens of any kind, you just need a hole. So if you have a window that faces the outside world, in a room, just darken the rest of the room completely, that means putting a towel like under your door, and maybe up above, if there's big openings that let light in, you need to block all the other sources of light, and just allow a little bit of light in through one opening. And it doesn't have to be open to the air. So you could have a window with just a little, you know, opening that you allow light into your room, you will see this anywhere in the world, it cannot not happen, you know, light will come in the way that it does. And so you're gonna see images, and it is magical. I'm telling you, I've seen it many times myself, but I never tire of this phenomenon. And one of the things that I also know about Camera Obscura is is that when the sun is present in like if my window with my little opening is able to, in a sense, see the sun, like if the sun is out there in that direction, inside the room, that's going to be the only thing I can see is the sun because it's so

incredibly bright. It blocks my ability to see all of the other image and the image is everywhere in the room, it's on the floor on the walls on the ceiling, it covers everything outside the room. But if the sun is out there, you're not going to see the rest of this image because the sun's brilliance is going to block your ability to perceive all the other image. So most people that like me want to make a photograph inside of a camera, you typically don't want to include the sun, because it's intensely bright light blocks your ability to to see everything else basically. So when you're inside your apartment or inside your room, hopefully some days you'll be able to see the sun because then you're going to get this bright image of the sun in your room. But hopefully other days, you won't have the sun out there. Because then you'll see like people walking on your ceiling and stuff like that, that you won't be able to perceive if the sun is coming in to your room through that little opening. So yeah, it's a very fun phenomenon. One of my students I love to tell this story. One of my former students who's now the assistant curator, actually the full curator, believe it or not of photography at the Dayton Art Institute in Dayton, a student named Maria Postlethwaite. I'll never forget when she first saw the inside of the Camera Obscura that we have in the School of Art. When she first saw this phenomenon, she blurted out, "Oh, my God, I'm so happy." And that just made me so happy too, its like, wow, that's exactly how I feel still today, every time I'm inside of a camera obscura and seeing this amazing phenomenon that all of us should really be familiar with, because it's happening inside of all of our eyes. But we just don't really realize it, I guess. It's an amazing thing to see in person. So I highly recommend that all of you make a camera inside your room. And all you have to do again, is block out all the light except for a little opening. You don't need a lens. You don't need technology of any kind. And it will happen inside your room and you will not forget it. I can tell you that.

**SD:** [00:18:49] That is so cool. And make sure it's not facing directly at the sun.

**AH:** [00:18:53] I mean, if the Sun is out there, you will basically see the sun inside your room and image of the sun. And that's pretty much all you'll see. Because it's so bright. You know, it blocks your ability to see the rest of the image.

**SD:** [00:19:05] Wow. I love the idea of the Camera Obscura. That's so fascinating.

**AH:** [00:19:10] It is absolutely fascinating. And you know, I don't know how much more information you want. But I did bring a bunch of stuff including this article by Don Ida. And it argues that the camera obscura invents modern science. This is an article from 2008. And it's a very interesting thought. So the history of cameras might be the beginnings of photography. And according to him at least it's also the beginnings of modern science. And so lots of scientists use cameras and artists like Leonardo da Vinci, who was also a scientist. He was using camera obscures to help him with his drawings, both in terms of scientific drawings and in terms of, of art, you know, he was an artist as well as a painter and a drawer and a sculptor. So, many, many people over time have use cameras in a variety of ways to assist them with making images an pictures and paintings and so on. And so photography inherits a long history of camera use that predates the official introduction of photography as we know it today.

**SD:** [00:20:15] Oh, that is so fascinating.

[Note: Some tangential discussion from the audio file has been omitted]

**OF:** [00:20:41] ...I was thinking about something when you were explaining the way the camera works and creating the hole. So, I was trying to think of shadows. Also, is it the same idea? Or it's kind of different from, you know, the camera obscura thing?

**AH:** [00:21: 05] Yeah. Well, I hope I didn't stop you from fully expressing your question. Okay. Yeah. Great question. One of the inventors of photography was man in England, and the history of photography is super cool, in my opinion. So photography is invented around 1839. So a lot of what we've been talking about predates that a long way, like going back 2000 plus years if we're talking Aristotle and Al Hassan, and other people. So Aristotle's, you know, knowledge of cameras is something that happens a lot longer ago than 1839. But the official invention of photography happens around 1839 with three people, two of them are really probably the most important. One is William Henry Fox Talbot. William Henry Fox Talbot is the English inventor of photography and Talbot was using cameras very much like this one, he was using little box cameras, because they were well known. They were being used by people like Leonardo da Vinci a lot longer ago, you know, in the fifth 1400s, and the 1500s and Da Vinci's case. So cameras were well known by the time people like Talbot started thinking about trying to create an image using light sensitive material, like silver nitrate and so on. But Talbot to answer your question about shadows, Talbot had this great idea that he invented is the art of fixing a shadow. That's what he calls it. In his first announcement to the world in 1839, he calls his intention, the art of fixing a shadow. So he thought exactly like you were thinking that not only is it light that's being captured by these cameras, and again, you don't need any fancy equipment. You know, this kind of fancy actually has a camera compared to a box, but I wanted to bring this little box camera in because it's so simple compared to other cameras today. You know, this one is one of a kind of shot photographic camera. And so you've got a very simple box camera here. But the ones that Talbot was using, were even simpler by far. So just a box with a little opening, sometimes he would use a lens, too. So you've got lens cameras at that point as well. But you don't need to have a lens, you just need to have a small hole. And that will create the image on the back of his camera. And he was one of the people that put in light sensitive material in the back of the camera. And that way he captures you know, this shadow image or this light and shadow image on the back of the camera, and then he can develop it and fix it and show it to other people. That's, that's what we think of as photography, you know, today. So, it's people like Talbot back in 1839, with the art of fixing a shadow. So, thank you for that, great question.

**OF:** [00:23:56] Yeah. So, during the eclipse, we'll be seeing our shadows.

**AH:** [00:23:59] Yes. Yeah. The shadow of the moon will be all around us.

[Note: Some tangential discussion from the audio file has been omitted]

**AH:** [00:24:24] It was so shocking to me how many little images of the partial eclipse were out there. It was just like every it was like carpet.

**SD:** [00:24:36] Oh my gosh. And do you have any further questions? I think you've given us so much great material and very concise. Like you've been a great interviewee like I don't think we could have asked for anything better, honestly.

**AH:** [00:24:49] Thank you. Thanks for asking.

**OF:** [00:24:52] Sorry one more question before you go, I was thinking about looking at the weather And the Eclipse at the same time, will it affect the photography? Because I think that time it will be winter.

**AH:** [00:25:08] Good question. Yeah, the weather will. Hopefully not Cottonwood, it's going to be a clear day. You know, that would be so frustrating. If it's, you know, super cloudy day, then we won't be able to see what we're all excited to see. Yeah, so fingers crossed. It'll be a clear day. Yeah. Good question.

**SD:** [00:25:27] Fingers crossed yes. Yeah, we've been talking about this so much. If we don't get to see it.

**AH:** [00:25:31] Yeah, that'd be a letdown.

**SD:** [00:25:33] It wouldn't be a big let down. Um Trent, do you have anything you want to add? Or?

**TN:** [00:25:39] Yeah. So even if it was cloudy outside, let's say full overcast? How would that affect the light in the atmosphere anyway? Right. So would it still be completely dark, pitch black?

**AH:** [00:25:51] It'll be even darker. Yeah. If if there's a cloud cover, and then the eclipse happens? It'll, it'll be very much like night, I think. Yeah. When the full eclipse happens. Yeah. But I gather that even in that moment, like if it weren't cloudy, even in the moment of, of total eclipse of the sun by the moon, you don't want to look at the, the sun in that moment, because the corona of the Sun is also very bright to our eyes. And it can, my understanding is that can be very dangerous, too. So be very careful when you're looking at the Eclipse. Make sure you have the proper glasses on and hopefully, you know, there won't be clouds. Blocking our view.

**SD:** [00:26:30] We'll make sure to get the real glasses.

**AH:** [00:26:32] It'll be even darker. Yeah, with clouds.

**SD:** [00:26:35] So there will still be an observational difference.

**AH:** [00:26:38] Oh, yes. Yeah. If there's clouds. I hope that won't be the case. But it'll be harder to see. And maybe it'll block us completely from seeing. Hopefully not. Fingers crossed.

**SD:** [00:26:48] Fingers crossed. Knock on wood. Well, I think we, we've got everything we need for today. Thank you so much for joining us. This was amazing. Your expertise was very enlightening.

**AH:** [00:27:02] Well thank you.



[END OF INTERVIEW]