KATE CORDES: Welcome, everyone. Welcome to Doc Chat. We'll get started in a few seconds, just waiting for more people to sign on. All right. I think we can begin. Again, welcome, everyone, to Doc Chat. I'm Kate Cordes, the associate director for reference and outreach at the Stephen A. Schwarzman Building. And Doc Chat, for those of you who are new, is a weekly program series in the New York Public Library Center for Research in the Humanities that digs deep into the stories behind the library's most interesting collections and highlights ways that teachers can incorporate them into the classroom. In this episode, Ian Fowler, our geospatial librarian, is joined by Elizabeth Cronin, assistant curator of photography. Ian and Elizabeth will be discussing the many applications and meanings of aerial photography, providing historical context for its use in exploration, the military, mapmaking and more. Our guests will speak for about 10 to 15 minutes before we open up the conversation. During the program, feel free to use the chat function to share comments, though make sure you change your chat mode to panelists and attendees so that everyone is included in the discussion. Once we begin the question and answer segment, please use Zoom's Q&A function on the screen rather than the chat function to pose your questions. If you wish to remain anonymous, you can do that just by clicking that option before submitting your question. We would also like to know a bit more about you. So please fill out the poll that I'm about to launch. And I'm going to send it over to Elizabeth and Ian.

IAN FOWLER: Thank you, Kate. Excited to be here with everybody. So let's get into it. So Elizabeth, when we talk about aerial photography, I feel like we first have to talk about two things, which is technical advancements in photography and technical advancements in aeronautics. So how do we start with the history of aerial photography?

ELIZABETH CRONIN: We're going to start today -- it's, of course, a huge topic for a short Doc Chat. But we're -- I'm going to give a brief little history, mini history of aerial photography. And we're going to start with balloons, because that's really how it began. And it's kind of an interesting moment in the middle of the 19th century when balloon -- balloons are becoming very popular and also photography is becoming very popular and widespread. So first, we have here on the screen a lovely image from Sibel, the Science and Industries Business Library. And it depicts the Giant, which was this huge bulletin that Nadar, the French photographer, built. And he was very excited about aeronautics and balloon travel. It was his big investment. And he patented a camera to shoot vertically from the balloon. And he had a few mishaps, though. The story of aerial photography is always associated with troubling situations at first because this was a time when you had to expose your glass plate and develop it right away using developing chemicals. And so at first when he tried to take and develop his photographs, he realized that
the gases from the balloon were interfering with the chemicals of the photographs. So he had to
design a special cloth to hide in the basket. But this -- the giant balloon was specially designed,
and it included a darkroom in the balloon. And it was a two-story basket. So quite huge. It
unfortunately did not make very many ascents, and it was also not really a success but a really
interesting story in the history of ballooning and photography. And there's a lot of other short
little interesting tidbits like the British -- two British guys tried to take pictures of clouds. But they
got up too high and could barely breathe. So that almost ended in a disaster. They didn't come
home with any photographs. And basically, things got easier when the dry plate was invented in
the 1880s. And then you could take your exposures and develop them later. You didn't have to
develop them right away. And one of the things that -- you know, besides the sort of novelty,
that, you know, different perspective that the, you know, Nada was kind of going for was to use
photography in exploration. So one of the most famous sort of adventures for that, which also
was the -- well, it was disastrous is here from Solomon Andre expedition -- proposed expedition
to the North Pole. They didn't make it. As you can see here from the images, they crashed
pretty soon after they took off. But miraculously, many years later, the remains of the expedition
were found. And they were able to find the camera that Neil Strindberg especially designed for
the expedition and roll the film, which they then developed. So then they had a record of what
was going on. But there aren't really a bunch of aerial photographs. You know, most of the
photographs taken were after they crashed. So, you know, the history of the ballooning is quite
interesting. There's also a history involving rockets, kites, pigeons. But we are going to go on to
where aerial photography really gets its use, and it becomes more respected as a field. And that
is during World War I. As you can see here, we have a lovely image in the photography
collection of an aerial photographer. And he's -- this is a point where they figured out how to
attach the camera to the plane. But a lot of times, the cameras were handheld. And there were
a bunch of different difficulties associated with that, one of which was the vibration from the
planes. But they used -- they used the photographs for surveillance and to gain intelligence
about enemy whereabouts and movements.

IAN FOWLER: It was also something that'd originally been done in balloons. And so it's kind of a
similar leap forward in military campaigns.

ELIZABETH CRONIN: Yes, I forgot to mention that. Yes, with balloons, in a lot of the wars, the
Civil War, the Franco-Prussian war, the Spanish-American War, there was -- in the Civil War,
they're not quite sure if they actually took photographs or not. But they were -- in those other
wars, they were taking photographs from the balloon. Of course, it was very dangerous to be up
in the balloon during the war.

IAN FOWLER: Yeah, I don't think I would volunteer. It doesn't sound quite like the picnic it used
to be. And this is a great image on the right here. So here, we have in our plain view. And this
will lead directly into mapping. And so a lot of these were used to make maps.

ELIZABETH CRONIN: And you can see here in the next image, if I can get it that, a really great
picture. And this is slightly more of an oblique angle. So in aerial photography, you can look
down a vertical or an oblique angle. And here, you can see that this was used to show the railhead. And you can see the trenches and the trucks at the image so nicely explained. You can see those little squiggly lines in the front or the trenches.

IAN FOWLER: Yeah. And this will be used -- it's actually dismissed at first, especially by the Royal Air Force, as being not worthy. But then they realize the value of it. And then this is where the really detailed trench maps from all of Europe come from is these wonderful aerial photographs.

ELIZABETH CRONIN: Yeah, and I would -- and I need to mention as a, you know, historian of photography that Edward Steichen is the most sort of famous photographer associated with aerial photography. And he actually got into the war because he wanted -- he had quite a personality. He wanted to be the Mathew Brady of the First World War. He wanted to make the best photographs, the most remembered photographs of the First World War. And he joined the US Signal Corps, which at the time had the photography division. And then it was later the American Expeditionary Forces. And he basically was instrumental in organizing aerial photography, mobile, dark rooms, all the equipment, much of which came from France. And it really developed into something that was taken seriously. And it was quite useful.

IAN FOWLER: Indeed. Are we using a gelatin print at this point in time, Elizabeth?

ELIZABETH CRONIN: Yes, yes, which made it easier as well. But some of the cameras were -- they were still quite big and bulky. It's not until the Second World War that they're then you know, able to use 35-millimeter cameras, which really helped. And, you know, some of the difficulties, again, associated with this were keeping the parts of the camera from freezing when they are in the air because it was so cold. So not an easy task, but very instrumental in the outcomes of the war.

IAN FOWLER: Yeah. And so like a lot of things, if you want to go to the next slide that were kind of advanced or invented during the war, that technology comes home. And this is where we really get the advent of commercial aerial photography, especially in the United States and Canada. And so here, we have an aerial photography, a photograph from 1924 from the Fairchild Aerial Services Company, which was one of the biggest in the United States. And as you can see on the bottom right there, this was done through the auspices of the board of estimate and apportionment. And one of the things that delights people who enjoy photographs but kind of annoys people who enjoy cartography is that aerial photography is kind of not as useful because it involves observation and context. So if you're a New Yorker, especially if you're a Mets fan or a New York Park -- City Parks fan, you might know where this is. But if you don't, then it's kind of difficult to figure out which of the tens of photographs that were taken of New York City this is. And I will provide a little help with that on the next slide, which using our map warper has a Google Maps overview. So this is Mets Willets point. This is Printer Park, where the world's fair, of course, was. And it kind of shows the limitations that Fairchild had and aerial photography had in general in trying to make maps out of aerial photographs, which even
back in the balloon era was forecast as one of the things that's going to happen is we're going to be able to make these beautiful maps. But there's problems. The oblique view versus the vertical, as Elizabeth mentioned, is an issue, especially when you get to places that aren't flat, for example, Colorado. Very difficult in the 1930s and 50s to map through airplanes. And it

ELIZABETH CRONIN: Also, I should mention that they also use stereoscopic photography and aerial photography to try and get a sense of the depth and, you know, size of different buildings.

IAN FOWLER: And I was just going, it's perfect that you brought that up. So if you go to the next slide -- so the United States Geological Survey through the Army Air Force photographed the entire United States. And so this is a fairly typical US quadrangle. This is for Antwerp, New York. And so if you look at other countries, particularly Italy, Switzerland and Germany, when they issue these maps, they would issue them in red, green and also issue 3D goggles, so you could look at them actually in stereo. And this is talked about in all the manuals. Fairchild and their bulletin says that stereo is the way to go and that the scale on these admitted to by the Corporation is really not ideal for anything except for maybe oil and gas exploration. And that is where Fairchild has the biggest success, which is in excess. But as you can see here, if you're biking or wandering around Antwerp, New York have, the map on the left if you're used to orienteering and wayfinding is very useful. But the aerial view on the right doesn't really have the same use. And so in this regard, it has a lot of promise, but it really doesn't translate into the mapping potential it has until we get to GIS and we get to satellites. And one of the issues with that, of course, is the issue with all mapping of the globe us projection, which Google uses a 1710 projection invented by LaToya Sweeter, for those who don't know. And I think we can see in the next slide kind of where it leads. So we go from the vertical on that last slide back to the oblique, as much as with Elizabeth’s photograph of World War I and this beautiful 1952 map and photo spread of Uruguay. And so here on the left, we have a map, also not very useful. But then a very kind of pretty photograph showing you where all of the spas and everything are in this town and why. But again, not very useful for wayfinding or much of anything else, except for pleasure.

ELIZABETH CRONIN: But here's the really interesting, you know, where the sort of youth goes along with the novelty of it. People like looking at things from above. And they think it's neat. And so, you know, whether it's useful or not, it looks great. And it becomes part of modern, you know, a modernist aesthetic also in the early 20th century.

IAN FOWLER: Yeah, I completely agree. And they're fascinating. And they're beautiful. And, you know, we photographed everything from the moon with film all the way down to tiny towns, mountains and everything else.

ELIZABETH CRONIN: I think we can take some questions from the audience now.

IAN FOWLER: I think so.
KATE CORDES: Okay. Well, everyone, I welcome you all to submit your questions in the Q&A function. I can start off. Elizabeth, I have a question for you and Ian perhaps as well. The photographs that came out of the balloon expeditions, the early ones, is -- I mean, how did that change people's perception of their environment? Was it -- I mean, was it a new view? I'm assuming they had aerial type.

ELIZABETH CRONIN: Yeah, it's a new view. It's new. But as I said, I think it's more of a, you know, wow, that's really cool kind of thing, rather than -- in the beginning, it was -- there was some use, maybe. You know, and it's the mapping, right? The reason that we're talking to each other today. But how useful it actually is up to date.

IAN FOWLER: And it was extremely popular. I mean, everywhere. Like, everywhere there was ballooning, there was hundreds of thousands of people who either saw the ballooning and went and watched it with a picnic or went up in the balloons. Aeronauts were famous. And it builds up a tradition of bird's eye views in both painting and in cartography. At least in cartography, beginning in the 16th century. And so it has something to build on.

KATE CORDES: Yeah. I assume people are always going to the highest point and trying to get the vantage from there.

IAN FOWLER: And we still do today, right? We go to the Empire State Building, and we look down. And it's really amazing. And we, you know, people like to sit next to the windowpane so they can look down, because it's interesting. And whether or not you actually know where you are is a different question.

KATE CORDES: Question from Laura. How widely disseminated were these early photos? Were they commonly printed in newspapers or ephemeral publications or books? And -- or did they only get a narrow audience?

ELIZABETH CRONIN: I think some of the earliest views -- like, there was a very successful view taken from James Wallace Black of Boston, it was an aerial view that -- and I would have to do a little bit more research. But it was probably reproduced via wood engraving or etching. But, you know, it would probably say, like, this was reproduced from a photograph, which then lends it a certain veracity as an image. They were reproduced, but probably, you know, depending on the success of the image.

IAN FOWLER: And then I think -- and Elizabeth knows way more about this than I am. But the San Francisco earthquake and kite photography, that becomes kind of an iconic set of images that comes out of early aerial photography. But yeah, again, it's always funny because like, they have, you know, these images, like the balloon view of Boston and other things. And then they're always reproduced by etchings and all of these, like, popular journals, especially in Paris.
KATE CORDES: Question from Julie. Can you talk about the difference or the relationship between bird's eye views and aerial -- aerial views?

IAN FOWLER: Yeah, it's very interesting, I think, especially looking at this page, because with aerial cameras, you get the ability to take vertical photographs, as we saw especially, like, in the World War I and the Fairchild photographs. And then in the 1950s and 60s, they go back to the oblique view that is so popular in early bird's eye views. That's interesting from my perspective as a historian of photography. What do you think, Elizabeth?

ELIZABETH CRONIN: Yeah, and I would just add to that that some of the -- especially in modernist photography from the 20s and 30s, bird's eye views were really popular, these really strong angles. And a lot of those were just made from being on top of the building or radio towers or something and looking down rather than saying, you know -- and that that could be a difference between a bird's eye view and really an aerial photograph suggests that it's really high up.

KATE CORDES: A question of when did color photography -- aerial color photography start? Most of these we saw are black and white.

ELIZABETH CRONIN: Yeah, we don't have any color. [inaudible]. There were some hand colored photographs in the 19th century stereo views that were aerial photography that were hand colored color photography being useful and practical. Not so much until -- I mean, it starts in the '30s, '40s. But really, like, I would say not until the fift -- maybe it's really used more, you know, in a widespread way. And I would assume that just applies to aerial photography in the same way.

IAN FOWLER: Yeah. And I think it's important to remember, especially from a military context, that the black and white is helpful. And a lot of times, they work from the negatives. And they're just looking for things and looking for shadows. And they're looking for things that look conspicuous or maybe just intuitively don't look right. And so not having them in color in early photo interpretation and photochromatic map interpretation is actually more beneficial than color.

ELIZABETH CRONIN: I think that brings me to show you guys something, I have a surprise slide at the end.

IAN FOWLER: Secret slides.

ELIZABETH CRONIN: I know. A secret slide that I can show you. Here is an example of how they use these -- this is from a US Army Corps album from 1918. And it shows you how they use the photographs, the aerial photographs. And then from that, they drew the map, explaining what the details were. And they sort of redrew it based on the photograph and then explained, okay, here are the trenches. Here's the front line. And then they would photograph the drawing
so that they could make a lot of copies and then send them out to the people that needed to know where the movements and things were happening.

IAN FOWLER: Yeah, these are great because a lot of times, the people on the ground who were in charge didn't believe what the photographic intelligence departments were telling them. And so they send these out and say, like, no, there actually is a pontoon bridge, and you can drag things over. And they go, oh, I guess there is.

KATE CORDES: That's really cool. A comment to follow up on the color aerial photography from Michael. Ginsberg says Kodak developed a special film for aerial photography called Aero Ektar. Carmen has an interesting question, kind of get into how we use these photos. When comparing an aerial photo to a map of the same area, what questions are useful for analysis and comparison?

IAN FOWLER: So there's some pretty basic questions. I already brought up projection. That's a good one. Elizabeth brought up, like, height distortion. So if you're looking at something from an angle, flat ground, that's, like, let's say sea level is going to be more of a natural scale than if there's a mountain, a hill or a tall building. And so there's going to be distortion there. And I think what's also important to remember, and you can look outside probably anywhere and find somebody doing triangulation still on this day, is that, you know, the triangulation methods that the French first used to map France in the mid-18th century are still used today. And that's really where people thought aerial photography was going to take over. And it's only in a very few narrow fields that that actually happened. And so then I would -- I would also think that you could do kind of -- if you really want to get dorky, because you can determine, like, scale and things from aerial photography based on altitude, the time of day that it was taken, et cetera. And you get, like, really nerdy and compare that with the scale of triangulated maps. And you can just look at the beauty of the photographs and say, how beautiful is the map? There's lots of things you could do.

KATE CORDES: Okay. Let's see. We have time for a couple more. The -- let's see. Will you -- question from Brian. Will you expand on the photographers in military situations? Were they pilots who could operate a camera? Or were they experts in photography?

ELIZABETH CRONIN: They were -- so basically, they were trained. And I know in the First World War, Steichen had a training of them. And so they would go through extensive training. And they would learn, basically, they would learn how to be photographers. And they would learn how to specifically take the photographs from airplanes. And they would learn the developing, the printing, everything that they needed to be aware of. It was all training. So they weren't coming into it as --- I mean, Steichen was a photographer. He's a little bit of an exception. But otherwise, they were just military servicemen that were trained in photography.

IAN FOWLER: And in the Second World War, they specifically, at least, the -- especially the British used fighter planes that actually didn't have any armaments for photography. So that way,
the pilots could just focus on taking photographs. And that worked until the Germans launched the jet engine at the end of the war. And then that did not work anymore.

KATE CORDES: Another question from Laura. Broadly speaking, did aerial photography mostly focus on documenting and mapping locations early on mostly? Or did it become a creative expression, an art form at some point?

ELIZABETH CRONIN: That's a really good question. It's less of a creative -- I mean, it depends on how you look at it. I would say, you know, I mean, Nadar was a complicated figure. I mean, you could say his works were artistic. And that way, you know, they weren't just documentary. He was -- he was producing. You know, he was commercial. He was a brand. You know, he also photographed celebrities. Like, he was into -- he was into a lot of -- a lot of things. But there's also -- I'm sorry. I have a disturbance. To answer your question, there are -- sorry, Ian is going to have to take it over.

IAIN FOWLER: I'll take it over. So I'll just pick up off of her thread. So Black, who takes the first balloon video of Boston, also is an actual photographer. We have some of his photographs of baseball players and digital collections. And so there is this combination of people who are actually photographers, but then also just the enthusiasm of ballooning. Like, they take photographs, and then they write like 300-page word essays about the experience of ballooning and being up in the air. And it's great because, like, apparently, metrology -- like, meteorology didn't exist yet, because all of these things and balloons are, like -- and then all of a sudden, there was a gigantic snowstorm. And we almost died. And I think that's [inaudible].

KATE CORDES: All right. I have -- I see two more questions. One, can you speak about U-2 photography and the Cold War?

IAN FOWLER: Yeah. And that's interesting since we're talking about the Clear Skies Treaty again now. And that was first introduced by Eisenhower after World War II. And one of his plans for peace was that if all of the nations -- if all the big nations were constantly allowed to aerial photograph each other's countries, then we could reduce the possibility of there being another World War II. And that was rejected, unfortunately. And so then, you know, us and Soviet Union and some other people just did it anyway. And that's kind of the -- kind of the politics behind it and, of course, the technology behind it. And one of the early -- one of the early people who flew with the Wright brothers, and I can't remember who it was, actually suggested, like, stealth photography for military purposes, like, back then. So it was something that was thought about. And the cameras were incredible. I mean, they're -- like, the U-2 flies really high. And it produces better quality pictures than what was produced at lower altitudes in World War II.

KATE CORDES: Last question. Is there a retro or a newly imagined genre of aerial photography like the way people were making tintypes today?
ELIZABETH CRONIN: That is a really good question. There are, in a way -- there are in -- sorry, again. There are artists who are using more appropriated images. Like, Mishka Henner is taking images that are aerial perspective of the -- you can see -- that are aerial perspectives taken by, you know, that are found on Google. And then he appropriates them and uses them in his work. I'm sure there are others that are taking their own images.

IAN FOWLER: Yeah, I think if I go to, like, Greensburg and I see, like, a bunch of people with 18 kites all strung together, then we'll know.

KATE CORDES: Okay. There are a few more questions. And I'm sorry we can't get to them because we try to keep these things on time. There was the drones question that can be answered perhaps in the blog. But to wrap it up, just Ian or Elizabeth, do you want to explain how people can get to the digitized images that were shown here?

ELIZABETH CRONIN: Yeah, you can find many of them on digital collections. Other images that -- I showed some that were in the picture collection. Those, you'd have to ask the picture collection or me if you would like them. Also, the image from the books that I showed was also not yet digitized. Feel free to always send an email to map@nypl or photography@nypl.

KATE CORDES: Thanks. And I will say that links to these collection items and other resources along with the video and transcript of this episode will be published shortly on the library's blog, which will send out that link to everyone who registered for this episode. And all previous episodes can be found on that site as well. The easiest way to find a post is by subscribing to the Research at NYPL channel of the blog. And I will add that link to the chat. And just a reminder that these doc tests are held every Thursday at 3:30. Our next episode will be with the library's Matt Knutson and NYU Professor Oxt. And they will be exploring the archives of the financial firm, Brown Brothers and Company, and discuss the ways of locating the deep ties between northern bankers and the slave owning south. You can register at the link, which I'm going to drop in the chat. And you can look for future Doc Chat -- Doc chats on our event pages and on our research newsletter and social media. Let me just put that in here. There we go. And I want to thank Elizabeth and Ian and Elizabeth's special guest. And thanks for all the attendees and all the questions, which were really great. And again, sorry we couldn't get to all of them. But keep an eye out.

ELIZABETH CRONIN: And if you have questions, you can always email it.

KATE CORDES: Yes. Yeah. This is not the end of it. This is the beginning of the conversation. I have our contact information. You know where to find us. All right. Thank you, everyone. Have a great day.

ELIZABETH CRONIN: Thank you. Thank you, Kate, lan.