

Kattelle Oral History, Tape 3

August 19, 2003

Andrea McCARTY: Alan, I wanted to talk to you a little bit more about why you started collecting. We had been talking about this earlier [off-camera], and I was wondering if you can repeat what you said to me.

ALAN KATTELLE: Yes. I believe that I really began collecting seriously when I became interested in the development of the technology. I was determined to acquire as much, as far as possible, every camera that represented a forward step in the technology. Of course I couldn't immediately tell whether a particular camera was an important one or not, so my rule of thumb was, if it's a movie camera, and I can afford it, I'll take it and wait until I get home and research it to see whether it was important or not. That might be why I wound up with so many Model Bs. [Chuckles] But they make excellent doorstops. Not technically particularly attractive.

AM: So then, this brings me back to another question I asked you yesterday about what you do with all the excess, with all of the duplicates, with all of the cameras that, you know, are similar to

something that you already have? In your early years, did you do a lot of selling and trading?

AK: I tried to do selling and found that they did not market very well, as I may have mentioned. At a typical trade show, I might be the only table that had nothing but movies. Other tables, other dealers, might have a few movie cameras, but I was pretty much the one oddball. Out of two hundred dealer tables, you know, it was kind of funny to have just one that was movie [cameras]. But as I say, once I began to see the general outline of the technological history, that sharpened my focus somewhat, so that I got to know what I was really looking for. By that time I had accumulated numerous duplicates, but I tried to sell those. In some instances, I gave them away.

AM: I noticed with some cameras in the collection [that] you've collected different colors of the same model. Did you often collect them to details like that?

AK: Absolutely. I thought it was interesting that, you know, George Eastman was sort of like Henry Ford-- in the early cameras you could have any color you wanted, as long as it was black. But then he hired a world famous designer, Walter Dorwin Teague, who introduced colored still cameras, which became very popular with collectors. And I was fascinated to find that there was also some color variations in movie cameras.

AM: Clearly Kodak had a very good design team. When I look at some of these cameras, they're beautiful, especially some the ones from the thirties that are very art deco. Why do you think

that was? Was [design] a priority of Eastman, George Eastman, or--? Who led the commitment to design at Kodak do you think?

AK: I think probably the sales staff must have had influence on Mr. Eastman, persuading him to take this perhaps radical step, as far as he was concerned, and design for mass appeal and try to make the cameras aesthetically pleasing as well as functional.

AM: So you think it was market driven, rather than the sheer pleasure of creating a beautiful piece of equipment?

AK: Absolutely market driven I would think, yes.

AM: Because some of the designs are just beautiful. Okay, so Alan, we're going to start to talk about some of the equipment in your collection, and we thought we'd try to go somewhat chronologically and hit some of the most important pieces. You wanted to start with some of the pre-cinema— early, early, early cinema stuff. So, do you want to talk about the beginning of amateur film and film technology?

AK: This happens to be one of my favorite pieces. It also, as I look at it, it's probably the oldest piece in the collection, dating from 1878. But it's also very appealing because it was such an important step in the whole history of motion pictures, not just amateur, but motion pictures themselves. It was invented by a Frenchman, Emile Reynaud, and this is a toy version of the Praxinoscope, as he called it. But it was a toy that showed animation, and thus is an important step in the history of the motion picture. Doubly so, because Reynaud went on to modify

this principle and enlarge it to theater size. And for several years he exhibited, in Paris, his theater projection mechanism with the long continuous bands of images which he hand-colored and hand-printed. The show was seen by hundreds of Parisians, thousands of Parisians.

AM: When was this? This would have been the early 1890s, late 1880s?

AK: 1878 about. The tragic thing was [that] Reynaud discovered that he had a competitor, and the competitor was actual movies. Reynaud was so discouraged when the attendance of his theater dropped off, he threw most of his priceless bands into the Seine, and he died a broken man, almost in poverty. And it's so tragic because he was such an important person in the development of technology, and yet he was, in a sense, killed by the advancing technology.

AM: So he didn't move along with the technology.

AK: No. Of course he had so much time invested in this mechanism, that it would have been too much for him to start over again.

AM: About the toy Praxinoscope-- if he was touring Paris in the late 1870s having shows, when did he start to market it for the home? Would that have been later?

AK: No, the home came first. And that led him--when he saw how popular and how this worked, to show animation, he realized that it would be possible to enlarge it so that not just one person could view it, but a whole theater audience could view it.

AM: And where would the consumer buy the bands?

AK: No, the consumer didn't--for this toy?

AM: Yeah. Did the toy come with bands, or were there bands that you could--if you got bored with the bands you had, could you have bought more?

AK: I can only assume that you bought the machine with bands, and as you say, you could buy more if you needed to. I might mention that when I bought this it was like that [removing the candle from the machine], and I had to find a candle holder, and then wonder of wonders, I learned that there was a gentleman making photographic reproductions of this original lamp shade, and that's what this is.

AM: How did you figure that out? How did you learn about [the shade]?

AK: How did the man--? I have no idea.

AM: No, but how did you find him?

AK: I suppose on the Internet. [Chuckles]

AM: That's funny. Did Reynaud ever incorporate photographs into the band, or were they always kind of hand-painted figures?

AK: They were always hand-painted.

AM: So that was it. He never moved onto capturing--

AK: No, he did not. That's right.

AM: You have something in front of you. Did you want to talk a little bit more about early amateur film?

AK: This is a reproduction of another interesting, and essential artifact in the history of motion pictures. It's Plateau's [Joseph

Antoine Plateau] device that demonstrates persistence of vision. It requires holding a mirror and viewing it through these slots. Plateau was a fascinating man. He was very much interested in the eye and the physics of the eye. And in fact, in one of his experiments, he looked at the full sun through a lens, and subsequently went blind because he ruined his retina. But he didn't quit. He continued his work with his wife helping him and taking notes for him and that sort of thing. So he was a real pioneer in the science of persistence of vision. This is a reproduction of one of his toys that I made.

AM: You were telling me earlier that you use a metaphor to explain the evolution of projection and movies. Do you want to talk to me about that?

AK: I tell, chiefly for people who have very little knowledge of the movies, I tell them the motion picture as we know it today depends on three legs. And those legs are: number one, the art of projection, which is the oldest art and goes back to the seventeenth century as typified by a magic lantern. The second leg is the invention of film, which occurred in 1890 or so. And lastly, the third leg is that peculiar eye, brain phenomenon which we erroneously call persistence of vision. Physiologists tell us that that's misnomer, that there isn't any such thing; that the retina doesn't retain the image but your brain does. So those are the three legs that support the motion picture as we know it today.

[Tape paused]

AM: So we have the next piece of equipment, and I asked you to put it up against a white background for a minute so people might be able to see it a little bit better. I know that the light in here is not ideal. Let me see if the camera will adjust. No, still not better.

AK: What's happening that you don't like?

AM: You can't see the detail very well, and I think that's just because it's black and we would need to light it.

AK: You know, do you think that we may run into that again? Because what I'm thinking is [that] I could clip a light here that would show on this.

AM: Let's pause for a minute and talk about that.

[Tape paused]

AM: Okay, can you talk about the Ernemann projector?

AK: Yes. Almost as soon as motion pictures became commercially successful in theaters, various entrepreneurs looked for ways to bring this new amusement into the home. This projector, I believe it dates from 1898 or so, made by Ernemann, a well-known German concern, is very typical because it is a projector designed for the home, but it uses commercial 35mm film.

AM: Is that nitrate film?

AK: Nitrate film. I am particularly fond of this example because, from a technical standpoint, its film advance is by the so-called beater movement, which you probably can't see. An actual

beater comes down and pulls the film down frame by frame.
That was an early method of film advance.

AM: Let's see if I can demonstrate its full effect. I don't know if it will show up, but-- so the beater comes down and catches the sprockets on each side?

AK: No, it doesn't even do that. It just holds by the geometry of it. [Chuckles] There are no teeth on the beater; it just pulls on it. Another interesting thing about this projector, and it's typical of the day— you'll notice how the lamp house slides over. And that is to provide for the projection of lantern slides. Here is where a small magic lantern slide could be put in this slot and projected on a screen. That was very common on early home movie machines, because up until the time of motion pictures, the magic lantern was the one projection machine that was common in the homes. The Edison Home Kinetoscope had the same thing. It was a movie projector but it could also project slides and those slides for the Edison Home Kinetoscope are among the rarest artifacts going.

AM: Do you think this projector was a success? Was it most common in Germany? Do you know anything about what happened to Ernemann and how the projector fared?

AK: Well they were very successful in other photographic fields, in cameras and projectors. This is the only one I've ever seen, for what that's worth. I'd say that it probably didn't have a big

market. But there were similar American-made machines in this country. Keystone made an early one like this too.

AM: Okay. What do we have now?

AK: Well, we were just talking about the earliest appearance of movies in the home and they were by that Ernemann projector. Of course, eventually, entrepreneurs sought to introduce a camera for the amateur. This is perhaps a typical example of one of the earliest home movie cameras. According to the label, this was made by Barker Brothers Inc. in Los Angeles, and it is labeled as a combined motion picture camera and projector, and patent supplied form. And that is so typical in so many ways. Also the fact that it's made in Los Angeles is interesting. The birth place, so to speak, of home movies, of movies in general. I looked up Barker Brothers and discovered their main business was furniture making.

AM: Well that's a really nice cabinet. Look at the wood. It's really beautiful.

AK: Yes it is. The fact that it could be used as a projector as well as a camera was also very typical. The British Birtac [camera], for example, made by Birt Acres, was similar. And again it used commercial 35mm film, nitrate.

AM: How did the projection work? Are there batteries in there? Is there a cord, or--?

AK: Nope. What there was, in the rear of the camera-- I haven't had it off for so long, but you'll notice this circular disc that unscrews

and the space is the place for inserting a light, the projection lamp.

AM: Is there a shutter in there as well?

AK: Yes, I don't have a crank in there but—

AM: Okay. So in effect, it was portable, provided you had a lamp to bring with you?

AK: I'm sorry. I gave you the wrong scoop on that. This is where you put the lamp. As you can see, it gave access to this forty-five degree mirror, so the light beam would—here's the film coming down here, and the light beam would go through the film and out the front lens to serve as a projector.

AM: Oh okay. That's pretty cool.

AK: Yeah. And here are the film magazines. Oh, there's film in there. Almost guaranteed to be nitrate. I'm looking for edge printing and it says-- oh, this says, "Property of Pathé Exchange. Not to be sold".

AM: So that was film for projection then? It looks like there's a title there.

AK: If I had a magnifying glass-

AM: Now I'm interested. Hold on; let's pause for a second here.

[Tape paused]

AM: Okay, Alan and I just discovered-- we read the title on the film that was in the camera. It's a Pathé newsreel, and the title that we saw said *Glimpsing Chicago at the Field Museum*. So that was evidently in there for projection. Alan, what year was that camera again? Around 1908 did you say?

AK: I believe it was 1913.

AM: You had mentioned the home projectors, like the Kinetoscope. Was the Kinetoscope the first one?

AK: Oh no. That was 1912 and there were home projectors in the 1800s—for instance, the Ernemann was pre 1900s anyway.

AM: Was Ernemann the first?

AK: I can't tell you the very first. I doubt if anybody could really.

AM: Okay, what do we have now?

AK: We have another typical, early, amateur motion picture camera. This one was made by the A. S. Campbell Company in Boston, Massachusetts. And this was a camera only, not convertible to a projector. The company made a Cello projector, a huge machine which I own, but it's too big to have in this room.

AM: Did people often have such a large projector in their home?

AK: I don't know how good a market there was for this. Let me say that this is the only one I've ever seen, so I doubt that there were very many sold.

AM: How big, just out of curiosity, is the projector?

AK: Oh, it takes a case about like so [gesturing].

AM: Okay. So that was a camera designed for amateurs.

AK: For amateurs, right. And it's 35mm.

AM: It looks heavy.

AK: Well, it's all wood, so it's not as heavy as you might expect. Or it's almost all wood.

A. S. Campbell also made— Can we cut a moment?

[Tape turned off]

AM: We're going to continue talking about the Cello camera. Do you know the date of that camera, Alan?

AK: No, I don't. Since it appears to be quite similar to the Pathé Kok and that was 1912--

AM: The Pathé Kok was a 28mm?

AK: Yeah. I would guess that [the Cello] is probably about the same era. Also, it's interesting that it's a Boston company. The only other Boston manufacturer of cameras and projectors that I know of was Keystone.

They also began about 1917. So, so much for that.

AM: Did Campbell do very well? How long did they—do you know anything about [them]?

AK: I have no idea. Again, all I can say is this is the only Campbell camera/projector I've ever seen.

AM: Can I ask you to talk a little bit about the market for 35mm cameras and projectors for the home? I would imagine there wasn't a very big market for it, but maybe there was. Do you have any idea about who was buying them, how they were marketed?

AK: I can't answer that because I wouldn't have-- the statistics are long since gone. Campbell, I have no idea how many they made. The only thing I can go by is how often they show up, and the fact that this is the only camera of this make that I've seen, and similarly the Pathé 28mm is a very rare camera; I've never seen another one of those. So I don't think they had a big

market, and they were fairly expensive, relative to the small toy projectors, which were cheap. Ten dollars or so. The cameras were not cheap and I don't think they sold very well. And of course people were aware of the hazards of nitrate film. There was a particularly disastrous fire in Paris. I've forgotten the date now, but you may have read of that. Dozens of highly placed Parisians were killed.

AM: And I would say that most of the film that we find-- the home movies that we find on 35mm, are usually of wealthy families.

AK: Yes.

AM: Okay let's move on. What do we have now?

AK: We have an amateur motion picture camera, dating from 1926.

AM: What's the name of this camera Alan?

AK: It is a DeVry and manufactured by Herman A. DeVry, a German immigrant who came to this country in the very early twenties and became an innovator for many things, one of which was a portable projector with which he perhaps showed the first in-flight movies.

AM: Do you know what the first movie he showed was? Was it a newsreel or—?

AK: It was a newsreel as I recall, and he flew over Chicago. There's a picture of him in the plane with his projector set up in the aisle.

AM: So this is just a projector, not a camera?

AK: I'm sorry; this is a 35mm camera/projector.

AM: [What can you tell me about it?]

AK: Here again, it is convertible. That is a giveaway on this aperture, which again leads to a forty-five degree mirror, to allow the light beam to pass through the film.

AM: Okay, so this was the DeVry Standard Automatic 35mm Camera/Projector. So it's both. Okay.

AK: And it dates from 1926, I believe.

AM: Still nitrate film. But this was 1926, after 16mm had already come on the market, after 28mm was on the decline. Who was still shooting on 35mm then? For the home?

AK: I'm sorry. I don't follow your question.

AM: That's a 35mm camera/projector that was marketed in 1926, and that was after 16mm film had already come on the market. I'm wondering who would have still been shooting—

AK: What was the market for this camera, in other words? That's a good question. 28mm had not been successful. That's the whole trouble. Probably there's more to that in the book, but I just don't...

AM: That's okay, Alan. I was just commenting that this machine probably wasn't long for the market. Because if you could shoot on 16mm film you probably would have.

AK: Exactly. Exactly. And I was trying in my mind to justify that. You see DeVry went on to found a school of visual education.

AM: Where was that, in Chicago, or--?

AK: Yes. DeVry Institute existed for quite a while, and it was bought out eventually by Bell & Howell, I believe.

AM: Okay. And it was an institute for students of photography? Or?

AK: Yes. And I think it was promoting the use of films in education.

AM: Was the whole DeVry concern bought out by Bell & Howell at some point, or just the Institute?

AK: Just the Institute.

AM: Did they start to make 16mm and smaller gauges as the market progressed?

AK: I'm almost certain that there's a-- I think so, yes.

AM: And we'll probably come across one of those cameras as we progress down the line.

AK: I hope so.

AM: So that was—they never made a 16mm projector/camera [combination] did they?

AK: Not that I can recall, no.

AM: So that was more something with the larger gauges.

AK: And again, these are—I hate to keep saying it, but I've never seen another one. So you have to assume it wasn't a big seller.

[Tape paused]

AM: Okay, we're back to the DeVry camera again. Alan, you were pointing something out about it.

AK: Well, this is the means to convert it to a projector. This is the opening to where the light source would be put, but it seems like such a small aperture. And just to show that I do know what I'm talking about, there is the forty-five degree mirror, enabling the light beam to go through the film. Incidentally, the airborne projector that I mentioned was not this. It was more like a standard-sized machine.

[Tape turned off]

AM: Okay Alan, what do we have next?

AK: We have here the Edison Home Kinetoscope. It was actually an invention of one of Edison's engineers. It was introduced in 1912, and Edison, having contributed a great deal to professional motion pictures, decided that he would try to do something for films in the home. When he discussed the subject with George Eastman, Edison asked Eastman if he could supply film for the projector he envisioned, Eastman said, "I will supply you safety film. I wouldn't dream of giving you anything other than safety film for home use."

AM: I have a question. The people who were making 35mm cameras and projectors with nitrate film, were they getting their film from Eastman Kodak?

AK: Between Eastman and Pathé, those were the two major suppliers of film, yes.

AM: So why did George Eastman take this stand with Edison and not necessarily--?

AK: He felt that the professional projectionist, the theater operator, knew the hazards of nitrate film, and besides, there were laws written. The underwriters required certain enclosed booths and other safety precautions.

AM: Okay. But what about the people who were taking home movies on 35mm nitrate and showing them in their homes? Like the people using the [DeVry] camera/projector?

AK: Eastman couldn't control—he would sell 35mm nitrate to a professional—

AM: Whoever wanted to buy it.

AK: Whoever wanted it. He had no control over it— but knowing that Edison wanted it for use in the home, he insisted that it be safety film So, Edison devised a very curious format. The film was 22mm wide, and it had three rows of images. I don't know how we're going to be able to see this. Oh, look at that. Did that show up?

AM: Yep, that shows up. Actually, if you can unroll it a little bit more and give me a little more of the black. Yeah, there we go. Yes, that's clear.

AK: Okay, the camera shows that there are three rows of images, and there are two rows of perforations on either side of the central row. The purpose of that was, of course, to get as many projectable feet as possible on to a reel of film. The way that was accomplished was— this is the film transport mechanism.

This is to feed the spool. The film goes down through the film gate, out, and is collected in the lower sprocket.

AM: Can you show that one more time? I'm going to do a close-up on the...

AK: Surely.

AM: You were talking about [the path] through the gate, and I didn't get the bottom part of it. No, leave it just like that.

AK: Can you see alright?

AM: Yes, it's perfect. I just wanted you to show that one more time for the camera.

AK: The film comes off the feed spool up here, down through this channel which is the film gate, and out the bottom, and is caught by the take-up reel down here. Now, there are three rows of images. So how does one go from one row to the other? This wheel moves the whole film transport.

AM: So then the middle row, you go from take-up reel to— you go backwards. You go back up.

AK: Exactly. Let's say you start on the outside of the roll of film. You crank up through— then when you reach the end, you switch the film to the center roll and crank in the reverse direction. And then finally, you shift over to the last row and go back again in the forward direction. So that on fifty feet of film, you've got one hundred fifty images. [Note: On fifty feet of film you have the equivalent of one hundred and fifty feet of images.]

AM: That's pretty smart.

AK: Yeah. The light source was a miniature arc lamp. Edison also offered the projector with two other forms of illumination. One

was acetylene, you know, an acetylene torch, and the third was something called a Nernst lamp.

AM: What was a Nernst lamp?

AK: Good question. I didn't know until I was visiting the Eastman House archives one time and met this gentleman who— I mentioned what I was searching for, and he said, "Oh, we have one. I'll show it to you." I discovered shortly thereafter that my kind guide was the famous Dr. Rudolph Kingslake, the dean of lens design. And he was just the kindest, nicest man I've ever met.

AM: And you met him on a tour of the Eastman house? Or where exactly did you meet him?

AK: I had received permission to look in the archives, and Dr. Kingslake volunteered in the archives as a sort of free-lance curator. He would look through the archives for errors in the notation, or that sort of thing. He was giving his own time to do that. And I discovered that a Nernst lamp was a device that used a rare earth oxide, maybe cesium or something like that, and under applied voltage it glowed like a filament.

AM: Were they common?

AK: No. Very unusual. I've never heard of one since.

AM: Could each projector be outfitted with all three sources of illumination?

AK: No, you had to specify what you wanted. The machine got mixed results from the critics. I read that one critic said that the

[miniature] arc was a joke. However I've run this projector with an arc and found that I got very good results. Good enough so that we copied one of Edison's films onto Betamax. A Channel 4 camera man came up here and put his Betacam over his shoulder, and I set up the screen, and he filmed it.

AM: It wasn't the guy from *Chronicle* was it? [Note: *Chronicle* was an evening news show run on the ABC affiliate in the Boston area.]

AK: It was Art Donahue.

AM: He seems to be really interested in movie technology. He's an interesting guy.

AK: Yeah. Nice guy. I think his picture is up there [gesturing to a wall of photographs].

AM: Alan, do you want to demonstrate how the magic lantern part of this [projector] works?

AK: Yes, of course. This lamp house, in this case, you see is swinging. Let's hope we can get it all the way out.

AM: If you can't, that's okay.

AK: You'll notice up here that there are two lenses. One is for movie projection and one is for lantern slide projection. So, it's now in position for the lantern slides. The film path is out of the way. And, here is an Edison slide which is—can you see at all?

AM: Hold it out a little bit farther and I'm going to zoom in on it. Bring it out, and I will zoom in. Can you hold it at an angle? That's good. So it has ten images on each slide.

AK: Yes. And, they are designed to show in sequence. You put it in one way, and it's showing the top row, then after you've shown that—

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AM: And the bottom becomes the top row, and that's how you show the bottom row of the lantern slide.

AK: And Edison provided lecture notes to accompany the lantern slides.

AM: This is going to be tough to see. I'm getting a reflection off of the window. Let me turn off the light and see if I can see it better.

AK: Are we getting the outside window?

AM: The outside window.

AK: That's too bad because it's a...

AM: Well, let me read the top. It says, "Lecture on Edison Lantern Slide No. 57." It goes through each view and gives you a paragraph to read so that your audience can find out what the image is, and gives them some fun facts about it. See, you've got view number two, view number one. Can you lift it up a little bit Alan? There's view number three. That's good.

AK: Yes. You're through with that?

AM: Yes. So you've showed us how it works, but do you know anything about how it was received, besides the one critic who didn't think that the carbon arc worked very well? These machines are pretty rare, aren't they?

AK: Yes, but the archivists are finding them very interesting and worthwhile searching for. There is now a pretty good list of Edison Home Kinetoscope films.

AM: Right, there's a Union Catalog.

AK: Right. You see, the films that Edison provided were almost all reduction prints of films that he made in the Black Maria, and he had done several films on the early days of this country. The people who were running events during the Bicentennial year [1976] thought it would be wonderful if they could make 16mm prints of those films and distribute them to high schools throughout the country. And the only source for those films that they wanted, like *Washington Crossing the Delaware* and so forth, were the Edison 22mm films.

AM: Where did they find them?

AK: Well, that's a good question. But once they found them, the next problem was how to transfer them from 22mm to 16mm.

AM: So how did they do it?

AK: They enlisted the help of one Karl Malkames, the son of Don Malkames the well-known Hollywood cinematographer. And

Karl built a special printer to take the Edison films and print them onto 16mm stock.

AM: And those were distributed across the country?

AK: Right, to high schools across the country.

AM: I have a question about Edison. He seems to me to be a very controlling sort of inventor. He did not want the audience to have any freedom with the technology he gave them. That's my impression of him.

AK: I'm not sure. How do you square with that with the fact that he offered three different lamp arrangements?

AM: That's true.

AK: The film, you could buy in short lengths or fairly long lengths, but--

AM: But, with his technology, he was the only person who made these 22mm films, and the audience was going to get the films that he made for them. He wasn't— didn't seem all that interested in making a camera/projector so that the audience could make their own 22mm films to show.

AK: That's true. I would say again, that's self-interest. It was an additional market for his films.

AM: It just reminds me of the old story about how he completely missed the boat on projecting film for an audience because he wanted everybody to look at his films one by one [in the Parlor Kinetoscopes]. I don't know. If you're going to sit here and analyze Edison, which I have really have no right to do, he just seems to be [so protective of his business model that he misses out on larger opportunities].

AK: I think he felt that once he made a machine that could show pictures to dozens of people, you wouldn't sell many machines. [Chuckles] That was his thought. At least this way, it was that every family should have one.

AM: Right. In their home, and they could show the films that he makes.

AK: Yeah. Right.

AM: Was he interested in having other people adopt the 22mm technology so that it would become a standard? Or did he want to corner the market, so to speak? It doesn't seem like he wanted anyone else to be doing 22mm.

AK: Actually, I think you have to face up to the fact that the Home Kinetoscope was not a commercial success. The figures that I found somewhere, show that less than half of those produced were ever shipped. They're still in the factory, and whatever happened to them, I don't know. It was not a commercial success.

AM: Why do you think it wasn't [a success]?

AK: Well, I would imagine that the arc lamp was a bit daunting to most people. Also, the technique of cranking one way and then cranking the other way, those were things that perhaps didn't come easily to the general public.

AM: Right. You really had to have an understanding of the technology.

AK: Exactly. I hope I'm being fair to him.

AM: Well, he's covered admirably [in other publications], so I'm sure it will be okay.

AK: [Laughs] I can look up those figures, but an awful lot of those projectors were never sold.

AM: We're almost at the end of Tape 3, so I'm going to end Tape 3 here and put in a fresh tape for 4.

AK: Okay. So we can put this away?

[End of Tape 3]

