

Collecting Television's Technological History:

Steve McVoy in Conversation with Mark Williams

Steve McVoy is founder of the Early Television Foundation and Museum, a nonprofit institution dedicated to the preservation of early television technology, based in Hilliard, Ohio (a suburb northwest of Columbus). He has been working in television technology since his teenage years in Gainesville, Florida. After his studies at Cornell University, he owned a television antennas and cable systems business, and since 1999 he has dedicated his time to developing the museum's unique collection of historical television technologies. Mark Williams, editor of Journal of E-Media Studies, conducted the following conversation with McVoy about the museum's collection of historical television artifacts, the annual convention of early television, and the museum as a resource for conducting research in television history.

Mark Williams: Let's start at the beginning with your introduction to electronics and television, and then segue to an overview of the Early Television Foundation and Museum.

Steve McVoy: Well, I guess the earliest introduction was that my parents told me that I, at a very young age, was taking electronic or electrical things apart. At the age of two, I took my grandfather's toaster apart and of course was unable to put it back together. But for some reason, I've always been fascinated with television. There's a picture I have of me at age ten with one of those Radio Flyer wagons with signs on the side of it that say TV Repair or TV Service or something like that. [laughter] I have no idea where that came from, but I've always been fascinated.

MW: So that would've been about what year?

SM: I was born in '43, so that had to be '53. I think we got our first TV set about that time. And then I got a job when I was in middle school, working in a TV repair shop, and I would essentially just be a gofer for the technicians, take the chassis out of the cabinets, and so forth. Occasionally, they'd let me do some minor stuff, but that's basically what I did. And I also had my own business in eighth or ninth grade installing TV antennas.

We lived in a rural area in Gainesville, Florida. And the nearest TV stations were 75 to 100 miles away, and so you had to put an antenna on. When I was a senior in high school, I started buying sets . . . there was a big used TV market back then. People would trade in their sets, and dealers would resell the good ones and then they would dump the dogs.

MW: So this was in the late '50s?

SM: Yeah, late '50s. When I was a senior in high school, I remember I found a load of fifty TV sets that I was able to buy for I think something like \$10 apiece. I'm not sure how I got the money, but I bought them and repaired them and resold them to make some spending money.

MW: What was the typical image size on those sets?

SM: Well, by that time, 17, 21, and 24 inches was sort of the standard for sets. A lot of the sets I got were ten years old, so some of them were 10 and 12 inches going back to the late '40s and '50s.

My father worked for the State Department, and I was in Korea in the tenth and eleventh grades, and I worked at a Korean university. My physics professor in high school was an American guy who was a professor at Yonsei University in Korea, and we were trying to start a television station. I worked there and helped them put their station on the air. I bought a World War II surplus camera. In fact, we have one in the museum; you might've seen it when you were there.

MW: Yes!

SM: Those were available on the surplus market for hams to modify for ham television. So we found one on the black market in Korea.

MW: What kind of camera was it? Do you recall?

SM: It's an iconoscope camera that was actually a prewar design. When the war [World War II] started and RCA's engineers went to work on military projects, they took the camera, the last camera they had made before the war started in 1940, and ruggedized it. They used it in a couple of different ways, but one of them was, they put it in the nose of a wooden glider that was full of explosives and they took the glider up underneath the B-17. In the glider was the camera and a transmitter, and in the B-17 was a receiver and a monitor and an operator, and an operator would get close to a target and they would drop the glider, and the operator would attempt to fly it into a target using a television.

MW: Unbelievable.

SM: Yeah, it was not very successful. We modified it by building a tripod for it and putting a lens that you could focus on it. The lens that was in it, obviously, was a very telephoto lens so they could see something a long way away, so we put a different lens on it and built the generator and all that stuff for it. If I remember correctly, we found a surplus military transmitter that we could modify for, I think, channel 2, because there were no TV stations on the air then. This was '58 and the Korean War had only been over for a few years, and the country was still in a state of disaster.

MW: Let me ask you one detail about what you were describing earlier. What would it mean to "ruggedize" a camera?

SM: Well, if you look on our website [http://www.earlytelevision.org/rca_crv-59_camera.html], you'll see that we have a camera of the same design, small, of the commercial design before the war, and it's very small, lightweight, as light as possible because they needed to carry it and it was on a tripod. What they did was, they took it and they built it into a very sturdy metal box, and they put rubberized legs on it, because one of the problems . . . they wanted to minimize vibration getting to the camera, not so much because it would disturb the optical part of it.

Back then, electron tubes were subject to what they call microphonics, which means that if the tube vibrated, it would modulate the picture or the sound and cause interference. So if you took a tube or a typical TV cap back then and tapped on it, the picture would go crazy. So we built special tubes that minimized that problem, and also put the camera on rubber mounts so any vibration from, like, the airplane carrying it up or the glider going through the air wouldn't affect that.

MW: So they intended these cameras to be destroyed when the bombing raid occurred?

SM: Right. And apparently, I think, they never got them to work very well. The glider version, they ended that after a while. And the second way they used them was they took B-17 bombers that were past their useful flying life, and they would put two cameras in them, one on the instrument panel and one on the front window. And they packed the planes full of explosives and had pilots take off in them, fly them to coast of England, get them up to altitude, and then arm the explosives, bail out with their parachutes. And then another B-17 would fly the plane across the English Channel and crash the plane into a German target there.

And that worked well, except that there was a problem with the TV transmitter. The energy from it would often cause the plane to blow up before the pilots could get out. I think the television technology was progressing during World War II at an enormous pace, so they kept coming in with better and better camera tubes. The iconoscope was the first practical one, and then they got better, and then there was the orthicon, and all of that happened between 1942 and 1945. So they built new versions of the cameras which required completely different circuits.

I think what happened is that there were thousands of the cameras that weren't used during the war. And they ended up being for sale after the war in magazine articles. And there are quite a few of them. They pop up on eBay today, a few times a year.

MW: Fascinating. So, back to your work in Korea?

SM: I was there for two years. Came back for my senior year of high school, and continued my interest in television. And then I went to Africa for a few months because my father was transferred there. After high school, I went to Cornell in electrical engineering. And that was a mistake. I went to a very small, sort of experimental high school run by the University of Florida. I thought it was great, the stuff I learned, but it wasn't what I needed in an Ivy League university.

So I got to Cornell very ill-prepared. At that time, virtually everybody there had gone to a prep school. That was way before they had programs to bring in minorities and things.

MW: Yes.

SM: I was completely out of my element. Also, I wasn't very good at sticking to things and being disciplined and doing the sort of things you need to succeed in that environment. So I transferred to English lit the second year and then dropped out. But while I was there, I was doing television repair. I would spend weekends at my uncle's house about thirty miles away and started repairing TV sets for his friends, and word got around that I was pretty good at it and pretty cheap, so I did that to raise spending money.

MW: And why English lit? I'm curious.

SM: I don't know. Engineering was such a disappointment. I thought engineering was inventing. Nobody told me that engineering was very detail oriented, and that was not what I wanted. I've always liked a whole bunch of things, so I thought English lit would be fun to try. But I wasn't happy, and so I left and moved to New York City. I lived there for I think a year, a year and a half maybe.

Then I went back to Florida to join the Civil Rights Movement. And I worked for voter registration in north Florida, which at that time was just like the counties that bordered Alabama, in terms of their society. So I worked at voter registration for about six months up until the '64 elections. Then I moved back to Gainesville and started a TV repair shop and got interested along the way in installing antennas.

Back then before cable TV, if you owned an apartment building or a hotel, you could hire a company to wire all the rooms and put up one big antenna. So I did that, and I did that pretty successfully. But then cable came to town and that, almost overnight, that put me out of business. Because as I mentioned before, we were so far from the TV stations that the little antennas that I had put up on an apartment couldn't do the job.

MW: And what year would that have been, approximately?

SM: That would have been 1965 . . . '64, '65. I then got an idea. The big cable companies wired all the medium-sized cities. The large cities were a different story, that I'll talk about in a minute. So I got the idea that I could use the technology I was using in the antenna system that I had been putting in hotels, but use that same technology in small towns and build very inexpensive cable systems.

So I found a partner, and he stayed my partner for the whole time we were in business, for thirty-five years. And that's what we did. We first started building little cable systems in rural areas around, places with populations of 500 to maybe 3,000. We built cable systems there, and back then of course, you charged five bucks a month to bring in four or five channels.

In the '70s, '80s, and the '90s too, cable was a real simple business. If you did a good job in running your system and had good customer service, you could do really well. But starting in the mid-'90s, it started getting more complicated. We started getting more competition from phone companies and satellites, and it was obvious that we were gonna have to invest a tremendous amount of capital to update our systems, to do things like telephone over cable and internet access and video-on-demand. And we decided it was a

good time to get out. So in 1999, we sold our cable business.

MW: How did the Early Television Foundation and Museum come into being?

SM: When I sold my cable TV businesses in 1999, I was looking for something that would be challenging to do. So I thought it would be fun to collect old TV sets, because when I was a teenager, I worked in a repair shop and we'd get sets from the 1940s occasionally. I was really ignorant of the history of television. I had no idea they existed before World War II. First thing I did, was look on eBay for a TV set to buy, and the first one that came available was a prewar set. I bought it. It was in pieces and missing a bunch of stuff. And I started the project of restoring it, and in that process I met all of the collectors, all of the major collectors in the country. There were probably 200 people whose predominant interest is TV collecting, but I met them all very quickly, because of the internet. They said, "Who's this new guy?" I got emails from people and very quickly got to know the main players and went to visit them and saw their collections.

MW: And when you saw their materials, how did that affect your collecting practice? Were you interested in trying to duplicate what they had done, or something different from what they had done?

SM: It didn't really. I knew that I wanted to collect prewar sets because they were very rare, and I wanted to collect anything that was sort of unusual or rare. And they were looking for the same things. But the other thing I noticed in visiting these collectors is they were for the most part very gracious, and they were happy to show me their collections, which were always in their attics or in their basements or garages.

MW: Now, when you visited these collectors, is that part of where you became more educated about television history?

SM: Yes, I learned all of that and of course the internet was becoming a really valuable source for that kind of information, even then. I learned a lot from talking to collectors. There were two or three major collectors in the US, and one guy in England that I spent quite a bit of time with, and that's where I learned the basics. I ended up buying from all three of those people; if they had duplicates of a particular set, I would get the worse of the two from them. In the early days, that was the guts of my real rare stuff.

I kept buying stuff on eBay but also from a few dealers who sold antique TVs still. I got maybe ten or fifteen sets. Some were interesting from a design standpoint, but most of them were pretty ugly or don't have a lot going for them. And they certainly didn't fit in with our home decor. So [I] relegated them to the basement and tried to figure out what to do, if I wanted to go beyond my ten or fifteen TV sets.

I realized there was no place in the country where the public could see this stuff. The Smithsonian had two or three TV sets on display. The Henry Ford [Museum] at that time had five or six. They've got so many things that they have to display, they can't really devote much space to any one technology.

This made me come up with the idea [of] starting a museum. A building became available, the one where the museum is now, in Hilliard, Ohio. It used to be a warehouse, and is way off the beaten path so we got it at a very low price. We renovated at first just a

very small part, and in the end of 2000 I moved the collection in and started the website [<http://www.earlytelevision.org/>]. Over the years, our buying declined and the number of valuable sets that were donated increased, and that's been the trend. If anybody has an old TV set and knows about us, and a lot of people have been donating their stuff rather than selling or having us buy it.

MW: From across the US or internationally too?

SM: Mainly from the US, because of shipping costs. A lot of times we'll get something donated that we already have in the collection, and we'll trade it for something else. In particular, we have a lot of TV broadcast equipment donated to us, and we have a limited display of that stuff, as it's not our focus. But it turns out that it was pretty valuable to camera collectors, so we've done several trades of TV cameras for TV sets.

MW: Could you provide sort of an overview of the collection itself? Perhaps one place to start is mechanical television.

SM: Mechanical television is the earliest form of TV. The rotating scanning disc was patented in 1884 [<http://histv2.free.fr/nipkow/nipkow1884a.htm>]. The rotating disc would spiral, and that divided the image into a series of lines and pixels, and then you sequentially transmit the light intended to each spot. Of course, back then there was no implementing it because there were not vacuum tubes and photocells that were sensitive enough.

In the mid-1920s, John Baird in England and C. Francis Jenkins of the United States produced pictures, very crude 20- to 30-line pictures [using this technique]. And then from 1928 on to about 1933, this kind of TV was broadcast. At its peak, there were probably forty-five [mechanical television] stations in the US and maybe fifteen stations in Europe. We have a number of those sets at the museum; several of them are working [http://www.earlytelevision.org/mechanical_gallery.html]. That technology was dead-end. The more lines you put in a picture, the dimmer it is and more light the camera needs. So it becomes impractical.

MW: So the sets also had rotating discs?

SM: The sets had rotating discs. That's how the picture was produced, with a neon bulb and a rotating disc.

MW: How big would the image be? And how far away could they broadcast?

SM: About the size of a postage stamp. Black-and-orange, not black-and-white. Very hard to see and tell what you're watching. In the early days, they used AM radio stations so they could broadcast long distances. There are verified reports of television transmissions from England to New York, and England to Australia in the late 1920s. There were people in Columbus that had TV sets that picked up broadcasts from Chicago and Washington and New York.

MW: Would those have been mostly hobbyists or engineers who were intrigued by the medium?

SM: Basically. And everybody thought that the mechanical TV technology would become practical at some point. But it never did. By 1933, all the stations were off the air. What held up the electronic television was the camera tube: they hadn't created adequate picture tubes in the mid-1920s. Until the mid-1930s, no one made a practical camera tube.

MW: So the fundamental difference between mechanical and electronic television is the way in which the lines are composed and distributed?

SM: Yes, in a mechanical television the lines and pixels are created by a spinning disc; in the electronic system, the lines and pixels are created by using cathode ray tubes and scanning an electron beam across it—and [in] the case of a camera, across a photosensitive surface. And in the case of a picture tube [that is, the screen], by illuminating phosphorous inside the tube.

MW: So could one initially watch images produced on mechanical television cameras but seen or projected on electronic television picture tubes?

SM: That's true. Starting in about 1931, they hadn't solved the electronic camera problem. They intended to build electronic receivers for the transmissions from mechanical television cameras. Around 1933 the first practical camera tube was available. And from that point on, it became all electronic.

MW: And much of this research was done at the corporate culture level, while some by hobbyists, amateurs, and inventors.

SM: Yes. The work on the mechanical part of it was done by lone inventors. With a couple exceptions, there were no big names. Basically they were small companies and individuals that developed the television cameras and the receivers. When it came to electronic television, RCA was the main player.

David Sarnoff ran RCA and realized that television was going to be a big thing, and put a ton of money into developing it. So he is primarily responsible for television development. Inventors were involved along the way, but he was the driving force in making electronic television possible. In 1936 he realized he had a working system, but also that it wasn't time to introduce it yet because the Depression was still going on and television was really expensive and cumbersome.

So he delayed introducing his system, but the BBC in England decided to go ahead and launch the first modern television system in 1936. We have a bunch of those sets in the museum, probably twenty, and [a] few more British sets of various types.

MW: It is a very impressive part of the museum. You don't necessarily expect to see that array of non-US materials in a museum.

SM: They were really the pioneers in terms of implementing. Now, the technology was predominantly developed by RCA, but they were the first ones to implement it.

MW: Could you say a word about a couple of individuals in television history, like

Philo Farnsworth and Harry Lubcke, who was a figure primarily on the West Coast?

SM: Philo Farnsworth [http://www.earlytelevision.org/philo_farnsworth.html] was one of the guys—and may have been the first, the history is really muddy—who sketched the idea of how an electronic camera might work. He and Vladimir Zworykin [http://www.earlytelevision.org/vlad_zworykin.html], who worked for Westinghouse and then RCA, were both working on developing an electronic camera tube.

And as I said, that was the holdup to television becoming practical. Farnsworth never solved the sensitivity problem of his tube. He produced a tube and produced a picture, and maybe even before Zworykin, but it was never practical. It required too much light. He is a great folk hero because it was the little inventor up against the big, ruthless corporation, RCA, so it made a great story. In fact, there was a Broadway play [<http://www.farnsworthonbroadway.com/>] about it that has fictionalized and glorified Farnsworth.

A lot of people call him the father of television. He doesn't deserve that. He was a contributor, but there were lots of people who contributed to the development of television [http://www.earlytelevision.org/farnsworth_prototype.html]. Lubcke was one of them [http://www.tech-notes.tv/Biographies/Harry%20L/harry_lubcke_page.htm]. He worked for Don Lee, who was a Cadillac dealer in Los Angeles and had a radio network, too, before that. Lubcke doesn't get a lot of credit, but he did some really innovative things and started a mechanical station [in] 1931 in Los Angeles.

And he was one of the first to use an electronic receiver with a mechanical station. In fact, in 1933, before electronic camera tubes were available, he produced a 300-line picture with a mechanical camera, which is phenomenal. It would only work with transmission of filmed footage because it required so much light, but his broadcasting consisted of a 300-line picture with a mechanical camera.

MW: How would that have affected the light requirements?

SM: Well, you could shine a movie projector directly into the camera tube, and you could bombard it with a lot of light, whereas if you put a lens in front of a camera, you've got to bombard the subject with a lot of light—and that wasn't practical.

MW: And this was still based on spinning disc technology?

SM: It was a spinning disc, 6 feet in diameter, in a vacuum chamber—because, if you make your calculations where the disc is big enough to have 300 holes in, the outside of the wheel would go faster than the speed of sound. So it had to be in a housing that was evacuated. It was quite a machine.

MW: And does that device exist somewhere?

SM: No. That's one of those things you'd just love to come across.

MW: Can you give us an overview of your collection? What you have, and what's most rarefied about it. And maybe how you hope to expand it.

SM: Well, I think we have fifteen mechanical sets [http://www.earlytelevision.org/mechanical_gallery.html], including some very unusual, rare ones. We have about twenty British prewar sets of various types, and about the same number of American prewar sets that were made from 1939 and 1940. We also have an American RCA prewar camera, and a lot of early postwar black-and-white sets, some of them very rare.

We have a television jukebox that was made in 1947, for instance [<http://www.earlytelevision.org/telejuke.html>]. You can put a quarter in and either listen to five 78 rpm records or watch TV for twenty-five minutes—just whatever was locally broadcast, which might have been a test pattern at that time. They were sold in New York City, which had three stations then, in 1947, before anybody had a TV set in their home. After that, television grew so fast that it was no longer a novelty that somebody would pay a quarter to watch. We have probably ten large-screen sets in the museum. Some of them were designed for the homes of very wealthy people, but most of them were designed to be put in public places.

We just got a donation of an RCA set called the Clubman that was designed to go into bars and clubs. They only made twenty-five of them, and one came available and a friend bought it for the museum. It is a big, tall, blond box with a 3- by 4-foot screen at the top of it. In 1947 and '48, before home sales of television sets really took off, every bar, restaurant, and club had a set, and that's where people watched TV. So the companies made these large screen projection sets for that market. They produced very, very dim pictures, but it was a novelty.

Then the next part of our collection is color TV. This is the area that's been growing the fastest. We've gotten a lot of really rare color sets donated in the last couple of years. The first color system was in 1950. It was developed by CBS.

We've had three receivers using the CBS color system at the museum for some time, and there are only a dozen that exist anywhere in the world. There were only a few made. Just recently, an anonymous donor donated one of the cameras for the CBS color system, the only one that exists besides another one at UCLA [http://www.earlytelevision.org/dumont_color_prototype.html]. A committee that was set up to form standards for all electronic TV finished its job in mid-1953, so I am sure that the set we got is the only existing prototype that Dumont made to test the color system. We have a growing number of those sets. We also have quite a big collection of early picture tubes and camera tubes. About thirty more tubes were donated to us in the last couple of weeks.

Finally, we have a small collection of British and European postwar sets that includes some very flashy elaborate designs, and a collection of broadcast equipment. The highlight of that is our mobile van, a 1948 RCA production truck that they sold to a number of TV stations around the country [http://www.earlytelevision.org/wgsf_van.html]. Ours started out in Salt Lake City and in 1960 was bought by a local educational station that operated it for about ten years and donated it to the Ohio Historical Society. It sat in a warehouse from 1970 until I learned about it and started working on trying to get it. It's on permanent loan to us, and is one of the most popular things at the museum.

MW: I have to say, I was stunned regularly going through your collection, but when I went into that room and saw an entire remote truck, I was completely gobsmacked. Just being able to wander around the truck and see the kind of spatial constraints and what they

were able to pack into that mobile unit is still very edifying. Does that equipment really work, or is it just on display?

SM: No, it doesn't work. But we plan to get one of the cameras working before next year's convention, so we can demonstrate a camera and probably a monitor within that truck.

MW: Indeed, another significant thing the Early Television Foundation did is starting an annual convention. What occurs at the conventions?

SM: We started our first convention [http://www.earlytelevision.org/2015_convention.html] in 2003, and every year it's grown. I think we started with about 40 attendees, and we were up to about 120 at the last one. We have a bunch of volunteers that come over and work on particular types of sets that we have in the museum to get them running. On Friday night we have a social event, and on Saturday morning we have a flea market and auction. This year, we had \$140,000 worth of stuff sold at the auction.

On Saturday afternoon we'll move to a conference center that's two blocks from the museum to have some presentations about various aspects of television technology or technological history. Then on Sunday we have some how-to workshops, with talks about how to align a color set, how to troubleshoot something, that sort of thing. And then we have an annual meeting of the museum and election of officers.

MW: Can you give me an example of what such a presentation is like?

SM: A lot of these are people that have restored TV sets. We had a presentation of the RCA-CT 100, which was the first commercial color set. A bunch of people that did research on various aspects of its engineering, the production line, the advertising, and we had four presentations on different parts of what they'd learned about the history of that first set. Some of them were just fascinating. A guy that was building a color picture tube, which is a big, big process, gave a presentation with pictures showing the various things he tried and what worked and what didn't.

We have a project we've been working on for four years now: it used to be a big business to rebuild picture tubes, because going back to the 1970s in particular, tubes wore out quickly and it was fairly simple technology to rebuild them. All of those companies have gone out of business, and we have acquired the equipment from two of them and set up a room with the equipment. We're working on rebuilding tubes for collectors on a nonprofit basis and hope to set up some sort of small-scale operation to rebuild tubes. All of the material still exists. We've solved all those problems, and we think it can be done at a cost that collectors will pay. It's just a matter of finding collectors to organize it. The other thing we do on Friday nights and on Sundays is that we turn on a bunch of sets that [we] don't normally turn on and let people see them working, in the mechanical sense.

MW: So do you feed the sets programming of some kind? Or are you just happy to see the tube light up?

SM: No, we have DVD players and cables in each room that run every day when

we're open, with old TV shows on them. We have different ways we operate our mechanical sets. One of them operates from a computer program that converts modern TV images to the mechanical standards. Then we have a mechanical camera that you can watch yourself on one of the sets. And we have standards converters that can put normal TV into it and any kind of TV standard will come out of it. We use those for the sets that don't use the modern broadcast standards.

MW: Amazing. How would you describe your constituency? Who comes to the conventions? Are they all electrical engineers of some nature?

SM: Most of them are all related to technology in some way. We have people that are engineers, who worked in the television industry, or cameramen. We have students, radio collectors that like TVs too, and some people who [live] nearby that come every year. And then we have a bunch of people that are collectors that don't know much about what they're doing, they just like the looks of it.

MW: Is there a record of these presentations?

SM: We have a YouTube channel [<https://www.youtube.com/channel/UCuPxvfS9a88axMOueu1rzLg>]. Videos of every convention are online right now in various places, and we are in the process of moving them to our YouTube channel.

MW: In closing, can you tell us something about what kind of research could scholars of early television conduct in the museum, and how can the museum's collection be accessed for such scholarly purposes?

SM: For those interested in technical details of early sets, such as the types of components used, mechanical aspects of how sets were built, or even cabinet design or construction, we have a large selection of sets from each era that could be inspected.

Outside of the artifacts, we have several hundred books and documents about early television in our library. For example, we received a donation of fifty developmental camera tubes from RCA from the 1940s and '50s alongside two huge boxes of RCA documents and design characteristics. We also have the collection of all the papers, patents, and design notes of an inventor of a 1970s color picture tube that became the basis of the Sony Trinitron tube, and we have a collection of The Collaborator, a newsletter published by [Ulises Armand] Sanabria. Scholars are welcome to go through it. We have a partial index of our holdings in an Excel spreadsheet to help find stuff. We also have online the service data from probably, I'd guess, 500 models of TV sets. I would really like to get the libraries scanned and organized. But for now it's stored and it's safe and it's growing all the time.

We'd be happy to have anyone who wants to do research visit the museum. We can give you access just about any time.

Mark Williams is Associate Professor of Film and Media Studies at Dartmouth College, the founding editor of The Journal of e-Media Studies, and co-editor of the book series [Interfaces: Studies in Visual Culture](#) for the University Press of New England. With Michael Casey, he received an NEH Digital Humanities Start-Up Grant to build the ACTION toolset for cinema analysis. He is the Director of [The Media Ecology Project](#) (MEP), a digital resource that facilitates the awareness of and critical study of the dynamic ecology of historical media in relation to the public sphere and public memory. With John Bell, he received an NEH Tier 1 Research and Development Grant to develop a Semantic Annotation Tool for MEP.

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