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Interview: Henry Lowood (Stanford University Libraries)

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AG/CT: Can you give us a brief history of the Cabrinety Collection at Stanford Libraries? What treatment did the collection receive since it has been donated to the university?

HL: The Cabrinety Collection came to Stanford in 1998, I believe, at least the agreement was made in 1998. It came to us in a couple of stages due to some complications with where the collection was being stored by the family. So that means we've had the collection now for 20 years.

The Cabrinety Collection was the first software collection acquired by any kind of cultural repository (museum or library archive). There was one software collection that was available to the public before then; that was in the United States at the Library of Congress. However that was not acquired as a collection; rather, it was based on a voluntary copyright deposit of software. So they had a reading room with some software titles there but they had not acquired software.

So we acquired, I think, the first software collection. It was a donation and having the gift come through the door was only the first step; it set in motion a whole flow of work that continues to this day. Think of the workflow as a process that goes from acquisition through description of what you have, cataloguing and things like that, archival processing, preservation and then setting up access for the material. There are a lot of different things involved.

The Cabrinety collection is a complex collection: it includes software but it also includes printed materials, software in a whole bunch of media formats beginning around the time of the

Magnavox Odyssey, from the early 1970s through the mid-1990s, all the way up to CD-ROM. So there are a lot of different formats to deal with: paper, physical as well the various digital carrier formats. Many of those formats had not been dealt with by a library before then in a serious preservation system.

If you take the workflow I described, you have to map onto it a number of projects that were more like library research: how do you process a collection like this? How do you describe software? How do you migrate the software as a preservation strategy? Will you use emulation? We had a number of different projects to do those things, several of those were funded by the Federal Government, by the Library of Congress, by the Institute for Museum and Library Services, and by the National Institute of Standards and Technology (we did a project with them for several years). The phrase I use is that this is one of those gifts that keeps on giving. We have been doing work with this project now for 20 years.

We're at the point now where a big part of the collection (about 7,000 titles) has been migrated to our digital repository. We're sort of at the last stage of that workflow where we're trying to figure out how to deal with access. That is partly a technical problem, but I would say the majority of it is about process and about legal matters and restrictions and agreements like that. We're getting close after 20 years to making the collection fully accessible.

AG/CT: So you're saying there is a team of people asking for rights to make it accessible through an interface on an institutional website?

HL: Yes. We did part of that work with the National Institute of Standards and Technology (which I'll refer to as NIST from now on). Their National Software Reference Library (NSRL), the team that does that kind of work, is basically the National Forensics Lab for the US. They came to us. This software library is basically a database of hashes and various signatures of software for people in forensics, like police departments, FBI and people like that. When they get a computer in a legal case, they have to quickly identify what are documents and what is the software that's on there. This library (NSRL) is a tool in that process.

They found out about the Cabrinety Collection and approached us because they knew we had a lot of micro-computing software from the 1980s. For this library it's important that the software be as untouched as possible because they don't want those hashes to be compromised in any way if somebody had modified software, for example. Much of the Cabrinety Collection, in fact the vast majority of it, came to us in shrink wrap, so this was a goldmine for them: this software

from the 1980s and early 1990s, even the 1970s, that was not touched.

So NIST came to us and said in return for us making the collection available to them they would do most of the work of migrating the software, that is creating disc images in the various formats, that we could put into our digital repository. They funded that and we developed the project that we completed over a number of years. There was also a component in that project that involved contacting rights holders because the conversation was so complicated as we tried to figure out beforehand what copyright law, the Digital Millennium Copyright Act and so forth, would allow us to do.

There is a specific paragraph in the DMCA about circumventing technological prevention measures. How do we interpret that? What do we do? We decided, "Forget it, we're not going to try to interpret this, we're just going to contact rights holders." If you look at a collection of 15,000 to 20,000 pieces of software from that time period, it's going to be a long tail, there are going to be a few publishers that have lots and lots of titles (Microsoft, Activision, Electronic Arts), and a whole bunch of defunct publishers and developers with one or two or three titles. So we decided we would just work on the front end of that curve and contact the publishers who had a lot of titles in the collection. We did that for about a dozen rights holders. With that we probably covered several thousand titles. It turned out to be very interesting in that it did not succeed as a strategy. We uncovered a phenomenon that hasn't been discussed very much: there is a vast area of orphaned software.

AG/CT: Many scholars are working within the parameters of media archaeology and new materialism and some even suggest that humanities have taken a much needed material turn. As a curator with an interest in video games as cultural forms can you reflect on the advantages and pitfalls of material proliferation in the research institutions?

HL: It is a complicated issue partly because media archaeology means different things to different people and in different contexts. Clearly there is a scholarly direction, following writings of people like Wolfgang Ernst and others. There is an interpretive framework around media archaeology but there is also the practical growth of Media labs really that follow the idea of media archaeology. Of course, the Media Archaeology Lab in Berlin is example of that; I'm also thinking about Lori Emerson's lab in Colorado.

These two are interesting because they're both kind of outside the library, they're connected with academic institutions of course but the driving forces behind them were scholars who were

committed to a certain kind of research involving the presence and activation of equipment, as Ernst would say, "Listening to what the machines say to you in their mathematical language."

The question for libraries, archives, museums (the traditional repositories; from now on I will only refer to "libraries"), and for curators who work in those kinds of institutions, is one of deciding whether the various use scenarios that come up as a result of media archaeology can be supported in their institutions in ways that are useful to scholars or students. I think the answer is going to be very different from one institution to the next. There probably will not be many institutions that will be willing to make a full commitment to something like a media archaeology lab. The one in Berlin, for instance, relies on such a special commitment, usually to a particular researcher's needs. The researcher is very involved in the creation of those collections; typically, such initiatives can only happen outside traditional repositories.

Furthermore, and this is where things get a little tricky, the main paradigm of digital preservation these days usually involves migration, that is movement of software off of original media due to the problems associated with preservation of the media formats and maintenance of the equipment among other things. As an access technology, emulation has really gained the upper hand in most repositories; a lot of work is being done right now on different approaches to emulation within libraries, also collaboratively among libraries. Of course that's something that is very difficult to do with physical items. Also maintenance of physical items involves a tremendous commitment of resources. If you look at the Computer History Museum, there's a reason there's only one functioning PDP-1, a technology that's only 50 years old, from the 1960s. There's a reason only one institution has gone to the trouble of fully maintaining that equipment: it's expensive, it requires specialised knowledge, it's difficult to do.

At Stanford we haven't done that much with game software, but we have done it with other kinds of technologies. For instance there was a project that restored a working Model 200A from Ampex, the first audio recorder. That was a six month project by a retired engineer from the company. It is a big commitment to maintain even one piece of equipment. A media archaeology lab might preserve 50 to 100 pieces; you can imagine the difficulty of maintaining all of these in working order, but I think it is essential. It's never going to be something that all libraries will do; it will be done by libraries who see this particular use case of a researcher as fitting a high priority for their institution, so that that expenditure of resources makes sense for them. If we look 50 years into the future, researchers will need to travel to the Computer History Museum if they need to see a PDP-1 working, or to Stanford if have to see a working

Model 200A; that's the way it's going to be.

So I think media archaeology as a research paradigm is certainly causing libraries to think in different ways about supporting research, much as digital humanities generally has done that, but I don't think the decisions about which institutions are going to support that as a use case have really been made yet. I don't think the media archaeological turn, if you want to call it that, has moved from those seminar labs of a Wolfgang Ernst or a Lori Emerson to full scale commitments by libraries yet. So that's something that still needs to be considered and it's going to need to be considered in light of the expenses involved, the resources involved and the fit of media archaeology to the way that media preservation is done in those kinds of institutions.

AG/CT: Is it unlikely at this point that that an institution will be able to uphold and preserve the material phase of video game history (software edited on diskettes, cassettes and CDs)? Is digital migration the only solution at this point? Would any institution invest in acquiring all those material traces?

HL: In 2018 there is a very active community of collectors, including libraries, but also I'm talking about individual people who collect those things. I think right now there is no danger, except for a very few artefacts that are rare or exceptional. Mostly the physical artefacts are accessible and they certainly are in Cabrinety. We do repair items now.

In addition to Cabrinety we have a media centre where we have about 15 machines set up, current machines but also some historical ones. Addressing what the needs will be 50 years from now – which is what libraries often do – will be more problematic. The millions of Atari VCS's which were made are still available today by the thousands; that won't be the case anymore 50 years from now. There are a number of deteriorating components in any machine like that; I have already seen vintage machines of that era that are no longer usable just because of age, but there are plenty that still work.

For the short to medium term, libraries will continue to acquire items and new collections will continue to be built. I think for a student working in the next 10 to 15 years it will be an option to work with the original equipment. As we move further out it will be less and less the case but I believe there will always be specialised environments where it will be possible to work with those formats, just like today. There are places where nitrate film is stored, there are places where you can do traditional film editing, there are places where you can work with old audio

formats in a laboratory kind of environment, it's just not something that you would expect to find walking into the media centre of your library.

Today, you can walk into your library in many universities and possibly have access to an NES or to an old Atari machine along with software, but those machines will move into a more limited kind of circulation at some point as they become rarer and rarer.

AG/CT: James Newman among others has suggested in 2012 that audiovisual traces of recordings of gameplay should be a central focus in our efforts to preserve game history. You've led a major games project on preserving virtual worlds which sought to develop methods to document the volatile cultures that emerge in the context of online entertainment. Is there any plan to move ahead with gameplay recordings on a larger scale? What are your current thoughts on the topic? Do you think research institutions should archive community created Longplays or Let's Plays?

HL: I'm very much in agreement with James Newman on this. The basic idea is that you need the game itself as a core object in the archive, but also we need to use the game as a platform for the inclusion of other objects exposing the nature of gameplay. There are a couple of things I've worked on from this perspective; the Machinima Archive is one of those and then the Archiving Virtual Worlds Collection. Both of those are available through the Internet Archive and do include some recordings.

The Strong Museum in New York did, and is continuing to do, a project around contemporary gameplay of older games. Basically for many of their accessions, they are having people, usually students, play the games and record their game play. I think it's absolutely essential to do it, and I'm glad the Strong is doing it, but the thing that interests me the most both as an historian and as a curator is recording historical gameplay that has been preserved by the original community. So, for example, on the internet archive you'll see that there is a *Doom* replay from a player named NoSkill, who was killed in a car crash in the late '90s. At his memorial site his replays from his Doomgod days were preserved in the original replay format. I was able to get those and then play them using *Doom* and record the replay; those gameplays are from over 20 years ago, so that's the original game as it was played at the time by someone, now available on the internet. Obviously that's a different recording from the recording of a 20 year old playing *Doom* in 2018.

Basically what interests me the most is going after recordings from the original experiences.

We're starting a project now (myself, Eric Kaltman and some other researchers in Germany led by Martin Roth) looking at the *Doom* and *Quake* communities to see what we can uncover today; we're trying to figure out some methodologies for contacting players from that time period and seeing what they still have. I believe there are probably thousands of replays sitting in personal collections from that period but other than the web there hasn't really been a way to expose those. We know that many of the original community sites for games like *Doom* and *Quake*, or other games from that time period, are no longer on the web. A web crawling that was done didn't necessarily pick up those kinds of files, they may not have, so the web is limited in what it gives us.

For me the interesting project moving forward, and what I would like to engage with in collaboration with other researchers, is trying to get to the personal archives that people have of historical games to see what we can uncover about their gameplay. It doesn't have to be videos, it might be screenshots, notes to themselves that they'd kept about how to play the games and personal maps of text adventures that they played and that they kept. Today we would see such traces in the form of Wikis and so forth. This is kind of where I think the Let's Plays and the Longplays maybe fit in, even though these don't necessarily fit that criterion of players playing the historical games as contemporaries, they do however play contemporary games as contemporaries so they'll be historical at some point. What I really like about them is the commentary that goes with the play. I think that's very important because it provides contextual information. Game replays don't always speak for themselves, in fact they rarely do, they only speak for themselves to players who are experienced with the games. So to have somebody commenting along with the game play is a very useful document. Like I said, sometimes it's an historical document, sometimes it isn't, but as a help to interpreting how a game is played it's pretty useful. I think research institutions definitely should archive those sorts of things.

This is one of the many, many, many ways we could talk about how games are not like books or movies, you don't just watch them or read them. Sure, your interpretation might be different from somebody else but basically everybody pretty much gets the same thing by doing that. With games there is a lot that goes into it besides the different paths that people can take through a game, there's also just the knowledge that's built up by playing through a game, reaching a certain point, knowing how to do certain things and you just don't get that by watching somebody play. So you can help fill that in if somebody who is playing is also talking about what they're doing while they're playing.

AG/CT: Are there specific events at the Stanford Library inviting people to engage with the Cabrinety Collection? How do you try to stimulate research with this unique resource? What challenges are you facing in order to make it accessible to the community and how much do you have to limit interactions in order to ensure proper preservation?

HL: The last question first: I would love to be at the point where we're having so many interactions that we have to limit them. The collection use has been steady but, as far as Cabrinety is concerned, not so much that it threatens preservation. Where the heavy use occurs is in the media centre that I mentioned before, where we keep more recent titles, some historical titles but mostly it's a more recent collection. This is a circulating collection with equipment in the media centre that can be used by students and researchers to play games or activate software there. That's where most of the events and activities organised by students or instructors have occurred. There is a lecturer in one of programmes who teaches a course on the rhetorics of games. At one point she started something called the Zombie Challenge down there in 'Call of Duty' zombie mode; she basically challenges her students, or any student, to defeat her, to beat her in that mode. We've been doing that every quarter for a couple of years now, it is pretty popular and it's even expanded. One of the library staff has also challenged students to beat her at a couple of Atari games. So that's something we do down there as events.

For me the thing that I'm more involved with has been the use of the collections to support courses at Stanford. Originally those were my courses but now that we have some faculty who have been appointed to deal with game studies or in related fields we've had some other courses we've supported. For example last quarter Shane Denson just taught a course for which we set up some machines in the media centre for the students to use, and also acquired some equipment for doing video capture of the games they were playing. One of their assignments in the course was to develop a video diary (it didn't have to be games, but of some media they were exploring in the class).

Most of the researchers who have used the historical Cabrinety collection have been non-Stanford researchers, like yourself, who have come to Stanford from elsewhere. That's pretty typical for most of what I do, under the larger umbrella for the games collections in the Silicon Valley Archives here. The collection is also big enough and has enough international cachet that most of the research is done by historians and documentary filmmakers and writers and journalists coming from outside Stanford.

I have to say I don't really feel like I have to do much in the way of using events to stimulate research because I'm pretty satisfied with the level of research occurring as it stands.

AG/CT: Many journalistic features have recently tried to unearth and highlight the role of women a bit more in the development of computers and video games. Furthermore, we see many initiatives that seek to highlight local histories, the role of minorities, and even less edifying lineages (such as *kusoge* games). Is there any plan in the context of the Green Library that seeks to present and highlight the marginalised histories and voices that can be found in the collection?

HL: Absolutely. Actually it's not just a specific project but it's a pretty high priority generally for the collections. I mentioned earlier that game collection is also under the umbrella under which the Silicon Valley Archives operates. Leslie Berlin, the project historian for the Silicon Valley Archives, and I have set a high priority acquisition for collections that better reflect the current make up of Silicon Valley as it is today and as it has been for the last 15 to 20 years. So that would be not just women and their participation, but also different ethnic groups, different national groups, different socioeconomic groups and how they've contributed to the valley. Some of those are pretty challenging to get at, for example looking at certain ethnic groups, certain groups of immigrant communities in the Valley might require developing or making contacts with collections in other countries. As far as women are concerned we have in the last year or two acquired a few significant collections (again in the Silicon Valley archives) not so much specifically about video games, but we have been talking about a few things. Projects like that can be challenging for a variety of reasons, for example developing a History of Gamergate file in order to address the plurality of who gamers are. It obviously has to include different groups, different kinds of gamers, men, women. It also reflects this question of how the communities around video games, just like the Silicon Valley at large, are changing over time.

Doing a project around Gamergate is challenging, not just because of the nature of the new ways of communication that are involved with that, like archiving a Twitter hashtag and getting to those streams of communication, but it also involves some pretty acute privacy issues / legal issues that cause an archive to think about how to balance the need to get to the information, fully identify the participants in the debate while at the same time protecting people from the kinds of harassment that came out as a result of Gamergate.

Then of course there are also much more traditional ways of going about this: getting to the

personal papers of women who have been involved in game design, which is something we definitely want to do and can do. We have begun to do that with other related technology areas such as the semiconductor industry. We have acquired one major collection in the past year of a woman who had a long career going back to Ampex but then worked in computer science in a way that served the semiconductor industry. So we are doing that kind of thing as a high priority.

A lot of the work about women in video games is being done by documentary film makers at the moment and an archive like ours can play a supporting role. It means we can make our resources available to filmmakers to the extent that we have relevant resources, we can work with them to help tell the story of women who have worked in game design. Also we can provide ways to make those collections more permanent, we can archive the footage that was taken. So if a filmmaker does a documentary, let's say, about a select group of women who are in game design, that might be an 80 minute documentary that is based on hours and hours of footage, complete interviews and things like that. We have done that for some documentary films, again in related areas like venture capital and semiconductor industry. The oral history collection we have in that area is a good example.

The archive can assist the programme of making marginalised voices heard not always just by collecting things but also from various kinds of support for projects that other people are carrying out. If you look at the issue of women as game developers, in order to tell that story fully, in many cases it is necessary to do interviews and to be active in the documentation effort. Those are often not people who will have large collections of personal papers, the kind of documentation that we would have in an archive. Perhaps it is because they work for a company which kept the paperwork or didn't bother to preserve it. So it's necessary to find them and have them tell their stories more so than would be the case for the founder of the company, who was probably a man. Let's take the example of the recent article from a Polygon journalist who went out and interviewed a number of women who worked for Atari after the issues that came out at GDC around Nolan Bushnell. So that would be a case where the voice of those women would not have been found in any archive. It's just not going to be available, so somebody had to go out and get it

Libraries and archives need to play a role to support those kinds of projects if they're done by documentary filmmakers or researchers of various sorts. We need to collaborate with researchers who might be working on a project like that and say: "Hey, your interviews that you

do to support the writing of your book or the making of your documentary film, maybe those could be put into an archive." Then those stories that are not visible in the traditional way of thinking about an archive would become visible because those interviews and correspondences are preserved in a library.

AG/CT: We have a last open question about what you think would be the biggest challenges in terms of preservation and mediation to the public. Is there anything you want to add on that topic?

HL: One institutional move that will need to happen is that our libraries, archives, museums and so on need to do a better job of working with individuals, collectors, interviewers, documentary filmmakers. It's beginning but it needs to happen more. We need to make more connections between those institutions and the people out there who are doing things. Individuals are nimble, they know where things are, they can react more quickly, they can get to people, they have the energy and the time to find people and talk to them. That's something the institutions are not very good at.

What the institutions are good at is having procedures and staff in place to ensure that those resources are sustainable, that they're preserved. Individuals usually don't do as good a job on that front and that's why these institutions are essential. We need to try and solve those problems through better cooperation between institutions and individuals - game players and people interested in games and writers and journalists and filmmakers and researchers.