Episode Book

EPISODE #6096

How Long Does an M-Disc Actually Last?

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SYNOPSIS

Millenniata's M-Disc was marketed as "chiseling your data into stone," certified at over a thousand years under ISO 10995. Then the company went bankrupt, the Blu-ray version got harder to distinguish from ordinary discs, and skeptics started doing the arithmetic on that certificate. This episode walks through the actual evidence — the China Lake DoD test, a UK hobbyist's seven-month weather experiment, NIST's hundred-year rating — and then designs the aging test that would settle it: control groups, multiple burners, error-rate scanning, and microscopy. Plus why a national archive's climate-controlled vault beats a balcony, and how you'd pitch them on hosting it.

TRANSCRIPT



Corn

Daniel has a couple of YouTube channels. He never expected anyone to watch them. And of all the obscure things he's filmed, the one that got him fan mail from Switzerland was optical media.



Herman

Specifically the M-Disc.



Corn

Here's the story. He burned a batch of discs, ran checksums, labelled them, and left them on the Jerusalem patio as a mad-science aging test. Unrelenting summer sun, winter rain, the works. Then the apartment got small, Ezra arrived, and the spindles of discs on the balcony stopped being justifiable. He threw the experiment out. Heavy heart. And then the emails started, from people in Switzerland who wanted the microscopy data.



Herman

Which he no longer had.



Corn

So now he's burning M-Discs again for the first time in a while, and he wants to start over properly. Two things. How would you actually design the aging test from scratch. And how would you pitch a national library or archive to host it, on the theory that a shoebox in their climate-controlled vault beats his patio and his apartment combined.



Herman

Before either of those can be answered, you have to know what an M-Disc actually is. Because the entire pitch rests on a number that came out of a laboratory oven, not out of anybody's patio.



Corn

Start with the disc.



Herman

Millenniata introduced it in 2009. Write-once optical, sold as DVD and Blu-ray, the Blu-rays in twenty-five, fifty, and a hundred gigabyte versions. The original DVD version did something unusual. Ordinary recordable DVDs have an organic dye layer that the laser burns, plus a reflective layer. The M-Disc got rid of both. The patents describe the data layer as glassy carbon, substantially inert to oxidation, melting somewhere between two hundred and a thousand degrees Celsius.



Corn

Glassy carbon. That's a real material, not a marketing word.



Herman

It's real. The pitch they used was that you were chiseling your data into stone. Nothing to fade, nothing to oxidize, nothing to rot.



Corn

And the thousand-year number?



Herman

Comes from Millenniata's own certificate under ISO 10995. For the DVD, it states a mean expected lifetime over a thousand years at twenty-two degrees, fifty percent relative humidity. But the ninety-five percent confidence figure on the same certificate is five hundred and thirty years.



Corn

Half.



Herman

Roughly half. And in 2014, presenting to the Library of Congress, they claimed over a thousand years for the hundred-gigabyte BDXL at seventy-seven degrees Fahrenheit and fifty percent humidity, dropping to over a hundred and eighty years under harsh storage at a hundred degrees.



Corn

So the same disc is a thousand years or a hundred and eighty, depending on which shelf it sits on.



Herman

That's the whole claim in one sentence.



Corn

What happened to the company?



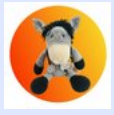
Herman

Bankrupt in December 2016. The assets went to the debt holders, who formed a company called Yours. And as of the last few years there are only two licensed manufacturers left, Ritek and Verbatim.



Corn

Two companies making the thing that's supposed to outlive everybody in this conversation.



Herman

That's the shape of it. And the reason Daniel's experiment is interesting is that every one of those numbers traces back to accelerated aging. Nobody has watched a disc for a thousand years. Nobody has watched one for thirty.



Corn

So that's the claim and the company behind it. Whether anyone outside the company believes it is a different question. And the answer is, not entirely.



Herman

Not entirely is generous. The skeptic's case is best made by a technical reviewer named Gough Lui, writing in 2015, and his central point is the one that hurts. The reason M-Disc exists at all is that ordinary recordable CDs and DVDs use organic dye. Organic dye degrades. Fine. But almost all regular Blu-rays already don't use organic dye. The high-to-low version, which is nearly all of them, already writes into an inorganic layer. Only the LTH variant uses dye.



Corn

So the thing M-Disc was invented to fix was already fixed.



Herman

On Blu-ray, largely yes. He also pulled Verbatim's own numbers. Verbatim's MKM archive BD-R dual-layer tested at five hundred and fifty-four years. The triple-layer at three thousand five hundred and eighty-eight years. Ninety-five percent confidence, twenty-five degrees, fifty percent humidity, same standard. Those are ordinary Verbatim discs. Not M-Discs.



Corn

Regular discs, longer than the special disc.



Herman

And then the arithmetic that made his review famous. If the mean is a thousand years and the ninety-five percent confidence figure is five hundred and thirty, the standard deviation works out to roughly two hundred and thirty-five years. Which means about half a batch reaches a thousand years. And something like half a percent falls below two hundred and ninety-five.



Corn

So one disc in two hundred doesn't make it to three hundred.



Herman

His line was that advertising your discs as lasting a thousand years when only about half will is a bit dishonest.



Corn

That's fair. If I sold you a battery that lasted ten years on average, and one in two died at five, you'd want to know.



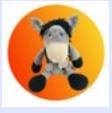
Herman

And it gets worse for the Blu-ray version specifically. In August 2022, users on a German site started reporting that their drives no longer recognized Verbatim M-Discs as M-Discs. The drive would just see an ordinary BD-R. By November there were threads on Reddit and Hacker News alleging Verbatim was putting regular discs in M-Disc packaging. The German tech press picked it up. Verbatim denied fraud and called the new discs a further development with the same longevity.



Corn

A further development that the hardware reads as a different product.



Herman

That's the tell, yes. And by January 2023 there were reports in the German press that the Blu-ray M-Discs might be discontinued entirely, because the new discs burn at six times speed instead of four. Which sounds like a manufacturing detail until you realize it's a different recording layer.



Corn

And today?



Herman

Today Wikipedia's own article notes that current M-Discs use the same MABL metal-oxide inorganic layer as many regular Verbatim Blu-rays. Somebody on Hacker News put it bluntly. The discs sold as M-Discs now are just MABL BD-Rs. They used to have a stone data layer. MABL was always designed for about a hundred years.



Corn

Hm.



Herman

Now, before this becomes a hit piece, the counter-evidence is real and it's interesting. The 2009 Department of Defense test at China Lake ran Millenniata's M-Disc DVD against Delkin, MAM-A, Mitsubishi, Taiyo Yuden and Verbatim. Every one of those organic-dye brands failed the accelerated aging series. The M-Disc was the only one standing.



Corn

That's a genuine result.



Herman

It's a strong result for the DVD. There's also a French lab test in 2012, ninety degrees at eighty-five percent humidity, where the M-Disc came in under two hundred and fifty hours, which was worse than a glass disc called Syylex. Though Syylex wasn't burnable in a consumer drive, so it's not a fair comparison for anybody at home.



Corn

Right.



Herman

And then there's the one I actually trust, which is the least scientific. A microscopy enthusiast in the UK named Mol Smith left a twenty-five gigabyte M-Disc and a standard TDK Blu-ray outside for seven months. February to September. Freezing, then the eighties, hail, and at some point they got partially buried in soil. The TDK was completely destroyed. The silver layer cracked and fell off. The M-Disc played perfectly after he washed it.



Corn

Washed it.



Herman

His verdict was, I don't know about a thousand years, but I can verify this is a great medium.



Corn

A great medium is a much smaller claim than a thousand years and I'd trust it more.



Herman

Which is roughly where the institutions land. The Canadian Conservation Institute rates Blu-ray recordables, dye or no dye, at five to ten years. That's their longevity table.



Corn

Five to ten.



Herman

And NIST, in a report published in 2022, lists M-Disc as an acceptable archival format rated for a hundred years or more. So the institutional consensus sits somewhere between the marketing and the skeptics, and it's built mostly on the hundred-year figure, not the thousand.



Corn

There's a symmetry here. The skeptic's case is strongest against the Blu-ray M-Disc. The original DVD was materially unique. The Blu-ray was always harder to tell apart. And the 2022 change may have erased the difference.



Herman

That's the synthesis. The DVD is the one worth testing. The Blu-ray may now be a question nobody needs to ask.



Corn

Which is a problem for Daniel, because I have a feeling the DVD is the one he can't buy anymore.



Herman

That is a real problem.



Corn

Okay. So the evidence is mixed, and the strongest case against is against the Blu-ray specifically. And that gets us back to Daniel's actual question. If you were going to settle this, how would you design the test?



Herman

The first thing to settle is that Daniel's instinct to move off the patio is right, and for a reason that took me a while to appreciate. He was testing whether a disc can survive a Jerusalem summer. That's a disaster-survival test. It's a legitimately interesting question,



Herman (continued)

and Mol Smith more or less answered it. What it isn't is an archival test.



Corn

Because nobody's archive has weather.



Herman

The claim on the certificate is about twenty-two degrees and fifty percent humidity. If you want to test the claim as advertised, you need a shelf in a stable environment. If you want to test something else, that's fine, but you have to know which question you're answering.



Corn

Then what does the real protocol look like?



Herman

The template is the NIST and Library of Congress study from 2005 to 2007. Ninety discs. Six stress conditions ranging from sixty to eighty degrees Celsius, fifty-five to eighty-five percent humidity. A minimum of four incubation cycles, with measurement between each one. And the measurement wasn't just whether the file still reads. On CDs they measured block error rate, on DVDs they measured parity inner errors, on hardware analyzers.



Corn

So an actual instrument, not a laptop drive.



Herman

An actual instrument. Now Daniel isn't going to buy a CATS analyzer. Those are five figures. So the citizen version has to do what it can with what it has, and the single most important choice in the whole design is the control group.



Corn

Say that again.



Herman

He has to burn ordinary Blu-rays. If the experiment has no regular discs in it, it cannot answer the only question anybody cares about, which is whether M-Disc is different. You'd just be measuring whether discs survive, and we know discs survive, roughly.



Corn

Otherwise he's spent ten years proving that plastic in a box is a good idea.



Herman

And it should be a spread. Original DVD M-Disc if he can find one. Current MABL Blu-ray M-Disc. A known-good regular Verbatim. And then a deliberately cheap no-name Blu-ray as a negative control, because if the cheap one dies and everything else lives, that's a data point too.



Corn

Multiple burners, or one?



Herman

More than one, if he can. Burner variation is real. And multiple write speeds, because the write strategy changes the mark quality. Every disc burned twice at two speeds, both copies in the experiment.



Corn

And then the measurement problem.



Herman

Checksums only tell you whether the file still reads. They say nothing about how close to failure the disc is. A disc at ninety-nine percent of its error budget and a disc at one percent both return the same checksum. So you need three layers of measurement. Checksums as the last-resort check. Error rate scanning, parity inner and outer failures on Blu-ray, to see the margin shrinking. And microscopy of the data layer, which is what the Swiss people were actually asking for.



Corn

Because the physical degradation shows up before the read fails.



Herman

Long before, usually. Discoloration, delamination, changes in the recording layer. If you're photographing the same spot on the same disc every year, you get a timeline of the failure as it happens, not just the date it finally died.



Corn

And you store them in the dark between inspections.



Herman

In the dark, in the same orientation, in acid-free sleeves, and you don't handle them more than you have to. Every inspection is a small perturbation. An experiment where you check the discs weekly is an experiment about handling.



Corn

Right. Wait. What's the honest limitation here?



Herman

The honest limitation is that accelerated aging has a ceiling on what it can tell you. The thermal tests model heat and humidity. They don't model light. They don't model airborne pollutants. They don't model the adhesive in the disc sandwich degrading, which is a real



Herman (continued)

failure mode and it has nothing to do with the data layer. Wikipedia's own article concedes the tests are only representative from a materials science perspective, and points out that real discs would never see fifty degrees in normal storage.



Corn

So the oven is testing something that doesn't happen.



Herman

It's testing the chemistry of the data layer, in isolation, very fast. It is not testing whether a disc in a box under a desk in Jerusalem survives thirty years.



Corn

Which is exactly the gap.



Herman

Which is exactly the gap Daniel wanted to fill, and the reason his experiment matters is that it's the only kind that can fill it. And the reason nobody has done it is that the answer arrives in decades.



Corn

So the design is, in one breath.



Herman

Four formulations, two burners, two speeds, checksums and error scans and photographs on a fixed schedule, stored dark in a stable environment, and a published protocol so the next person can repeat it. Annual inspection for the first five years, then every five.



Corn

And the hard part isn't the discs. It's the room.



Herman

Which is Daniel's second question, and it's the more interesting one, because I haven't seen a single case of a national library or archive hosting a citizen-run aging experiment.



Corn

Nobody.



Herman

Nobody. Archives accept optical media. The Library of Virginia has security storage. The National Diet Library in Japan takes CDs and DVDs as legal deposit. Institutions absolutely store discs. But hosting somebody else's longevity experiment, in their vault, on their climate control, publishing the results? I found no precedent.



Corn

So the pitch is into a vacuum.



Herman

Which is either a blocker or an opportunity, and I think it's the second one, but only if the pitch is framed correctly. Because there's a specific problem sitting in front of every preservation department in the world right now. The Canadian Conservation Institute's own guidance says the longevity of recordable CDs, DVDs and Blu-rays is uncertain, and that this has led to a widespread lack of trust by libraries and archives.



Corn

They don't trust their own shelves.



Herman

They don't trust recordable optical media, and they're right not to, because the number they're given is five to ten years. So the pitch is not, please let me store my discs in your basement. The pitch is, you have a preservation problem you cannot fund a study for, and I will run the longitudinal study for you, at zero cost, in your vault, with the data published openly.



Corn

What's the actual ask?



Herman

A shoebox of shelf space in a climate-controlled room and a stable environment. That's it. He keeps ownership, he keeps the discs, they keep them stable. They don't have to do anything except not move the box.



Corn

And what do they get?



Herman

They get named as a data steward, or a co-author. They get to point at a study and say we hosted the longitudinal test that the field has been missing since 2009. Libraries are in the business of preservation, and this is a preservation question they cannot answer with their own budget. There's no money in it for anybody, which is exactly why nobody has done it.



Corn

That's the pitch. You're offering them the missing data for free.



Herman

And the mechanics matter. He should approach a preservation department, not the front desk. Lead with the fact that NIST and the Library of Congress already ran the accelerated version of this study and published it. Offer to sign whatever access and liability agreement they want, and mean it. Propose the inspection schedule up front so they know how often a stranger is coming into the room. Commit in writing to publishing the raw data and the microscopy images, because that's the deliverable, not the discs.



Corn

And the thing he has to be honest about in the room.



Herman

The thing he has to be honest about is the timeline. If he walks in and says, give me a shelf for thirty years, they will laugh. If he walks in and says, give me a shelf for five years, and at the end of five years you'll have the first real-time error rate data on recordable Blu-ray that anybody has ever published, that's a project an institution can say yes to.



Corn

It's a five-year grant with no money in it.



Herman

Which is the only kind of grant most archives can actually approve.



Corn

Hold on. One more thing about the design. If he's putting a hundred-gigabyte BDXL in the study, that's a different beast from a twenty-five gigabyte disc. Different layer count, different chemistry.



Herman

Triple-layer discs have more internal interfaces and more adhesive. If you want the cleanest comparison, the twenty-five gigabyte single-layer is the one to build the core of the study around. The bigger discs are interesting, but they're a different experiment.



Corn

And that's the pitch.



Hilbert

My cousin sold optical media.



Hilbert

He told me the glassy carbon in the original M-Disc wasn't invented for discs. It was an industrial coating from a completely different industry, and Millenniata bought the rights to it. And the chiseling data into stone line was written by a marketing consultant who had never held a disc in his life. I don't know if any of that's true. I know he said it.



Herman

That would explain a lot about the marketing.



Hilbert

He also told me the data layer was never the problem. The polycarbonate is the problem. It yellows in sunlight no matter what's in the middle. You can put diamond in there. The plastic goes yellow and you can't read it.



Corn

Is that true?



Hilbert

I don't know. It sounds true.



Corn

It does sound true.



Hilbert

Anyway, I still have a spindle from the original batch. The pre-bankruptcy ones, with the Millenniata name on them.



Herman

You have original M-Discs.



Hilbert

I have a spindle of them.



Corn

Where?



Hilbert

In a box in my mother-in-law's garage. It's got wedding videos written on the side.



Corn

On the M-Discs?



Hilbert

On the box.



Herman

Are they your wedding videos?



Hilbert

No.



Herman

Whose are they?



Hilbert

I don't know. I labeled the box, not the discs.



Corn

So you have an unopened spindle of the only archival optical media ever made, in a garage, under a box labeled wedding videos, and you have never checked them.



Hilbert

I've been busy.



Corn

Hilbert.



Hilbert

The garage is in a town I can't name. I don't remember it. Somewhere up north, I think. My mother-in-law's been gone a while now.



Herman

So who's paying for the storage?



Hilbert

I assume it's fine.



Corn

You assume the storage is fine.



Hilbert

I have an arrangement with the man who lives there now. He keeps the box. I've never met him. The arrangement was made verbally, in a language I don't speak, through his nephew.



Herman

So there's a stranger, in a garage, in a town you can't name, holding a box of the most archival media in existence, under a written label that says wedding videos.



Hilbert

It's a good box. It's up on a shelf, off the floor.



Corn

That's the part that comforts you.



Hilbert

Water's the problem. Not the light.



Herman

Wait, you just said the light was the problem.



Hilbert

For the plastic. Water's the problem for the box.



Corn

Alright. I need a moment.



Hilbert

I need a level on Herman's mic. He's clipping. Second line of the last answer.



Herman

I'll take it down.



Hilbert

The discs are fine. The plastic yellowing takes decades, and it's a dry garage, I think. I'll ask the nephew.



Corn

Will you?



Hilbert

I might.



Corn

So there you have it. A box of possibly archival discs in a garage nobody can locate, held by a stranger, under a label that's wrong, and the man who owns them has never opened it. Which is, in its own way, a perfect illustration of the problem. Everyone says they care about long-term data. Almost nobody looks.



Herman

Which is the actual finding. The research problem isn't the disc. It's the person.



Corn

One thing before we go. The cutting-room floor detail. The NIST and Library of Congress study that everybody treats as the gold standard ran from 2005 to 2007, and when they published, five of seven CD-R products were projected past forty-five years. But only seven of fifteen DVD products. And two of them came in under fifteen years.



Herman

Two out of fifteen.



Corn

Two out of fifteen DVDs, bought in 2005, projected to die before 2020. That's the study the entire field builds on, and a seventh of its sample was already failing.



Herman

Which is why the archives don't trust the shelf.



Corn

So where does that leave Daniel. He wanted to know whether to restart, how to design it, and whether an institution would bite. My read is, the design is answerable and the pitch is answerable, and the honest answer to the third question is, nobody knows, because nobody has tried.



Herman

The one thing I'd add is that the Blu-ray M-Disc question may already be settled by accident. If the current discs are just MABL BD-Rs with an M-Disc label, then the thing worth testing is the original DVD, and the original DVD is the one that's hardest to find. That's the twist he's walking into.



Corn

The version worth testing is the version that's extinct.



Herman

Roughly.



Corn

Then the pitch is really a pitch for a study of a discontinued product.



Herman

It's a pitch for the data nobody has. That's a smaller thing and a better thing.



Corn

And it takes decades to be the data. Which is the part I keep coming back to. Daniel may restart the experiment. Some archive may say yes to a shelf. And the answer to the whole question will arrive around the time nobody working on it is still working on it.



Herman

Which is why nobody's done it.



Corn

Which is why it's worth doing. One forward-looking thought, and then we're out. The Swiss correspondents are still out there. If Daniel does get a shelf and does publish a protocol and does start photographing discs, they now have something to look forward to, and it's about twenty years out.



Herman

Which is a long wait for an email.



Corn

It's a long wait for anything. But it's the only kind of answer this question has.



Herman

Our producer Hilbert Flumingtop, who has a box, somewhere.



Corn

Hilbert Flumingtop, everybody.



Herman

If you want more of this, try episode eighteen sixty-one, Emergency Prep You Can Sing To; episode four, If Your Voice Ages, Does Your Fine-Tune Become Useless; and episode ninety-one, The Story Behind the Show. This has been My Weird Prompts.



Corn

The human-AI collaboration podcast. One thing, before we go. The show is on Spotify, and if you're getting anything out of it, a review helps other people find it.



Herman

We'll be back soon. Go check your boxes.



Corn

Goodnight, Herman.



Herman

Goodnight, Corn.

SOURCES

What the research for this episode read before the script was written. Primary sources first.

1. **Millenniata presentation to Library of Congress, 2014-09-23 [primary]**
https://digitalpreservation.gov/meetings/documents/storage14/Hansen_MDisc%20LOC%20Presentation%209-23-14.pdf

2. **NIST/Library of Congress Optical Disc Longevity Study, Sept 2007 [primary]**
https://loc.gov/preservation/resources/rt/NIST_LC_OpticalDiscLongevity.pdf

3. **Canadian Conservation Institute Notes 19/1, rev. 2019 [primary]**
https://www.canada.ca/en/conservation-institute/services/conservation-preservation-publications/canadian-conservation-institute-notes/longevity-recordable-cds-dvds.html

4. **ISO/IEC 16963:2017; https://ecma-international.org/wp-content/uploads/ECMA-396_4th_edition_june_2017.pdf [primary]**

   ECMA-396 (test methods)
   https://www.iso.org/standard/71159.html

5. **Wikipedia, last edited 2026-09-15 [primary-adjacent, well-cited]**
   https://en.wikipedia.org/wiki/M-DISC

6. **Gough Lui, 2015-10-16 (the key skeptical technical review)**
   https://goughlui.com/2015/10/16/review-tested-verbatim-lifet.../

7. **Mol Smith, Microscopy-UK, Sept 2016 (real-world outdoor test)**
   http://www.microscopy-uk.org.uk/mag/artsep16/mol-mdisc-review.html

8. **heise online, 2022-11-23**
   https://www.heise.de/news/Langzeitarchivierung-Verwirrung-um-die-M-Disc-7349953.html

9. **Golem.de, 2022-11-25**
   https://www.golem.de/news/betrugsvorwuerfe-verbatim-erklaert-verwirrung-um-m-discs-2211-170039.html

10. **and https://news.ycombinator.com/item?id=49586479**
    Hacker News threads on M-Disc
    https://news.ycombinator.com/item?id=33119940

11. **Library of Virginia optical media security storage guidelines**
    https://www.lva.virginia.gov/services/rm/storage