Podcast Transcript

EPISODE #312

Digital Stone Carving: The Secret Life of Optical Media

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EPISODE SYNOPSIS

In this episode of My Weird Prompts, Corn and Herman dive into the dusty closet of their housemate Daniel to uncover the surprising resilience of optical media in a cloud-dominated world. While most of us have abandoned physical discs for the convenience of streaming, industries like medicine and high-level security are doubling down on "Write Once Read Many" (WORM) technology for its unalterable nature and air-gapped protection. The duo explores the fascinating science of M-discs—essentially digital stone carving—and looks toward the future of 5D glass storage and robotic jukeboxes that manage petabytes of data without using a single watt of idle power. From the "hardware gap" to the quest for true digital ownership, this discussion reveals why the most cutting-edge storage solutions of 2026 might actually look a lot like the artifacts of the past. It’s a deep dive into physics, information theory, and the reason why your most precious memories might be safer on a piece of glass than in the cloud.

DANIEL'S PROMPT

Daniel

Herman and Corin, I'd love to discuss the state of optical media in 2026. While moving house recently, I came across my old collection of M-discs, which I used for backups when my internet was too slow for the cloud. I've noticed that specialized WORM (Write Once Read Many) media is still relevant in industries like medical imaging and modern cloud storage. Who is still using this technology today, and how much of it is still out there? Is the promise of high-capacity optical storage just a pipe dream, or is there still a real future for it?

TRANSCRIPT

Corn

Hey everyone, welcome back to My Weird Prompts. I'm Corn, and I'm sitting here in our living room in Jerusalem, which, if you could see it, is currently a bit of a disaster zone. We're in the middle of a bit of a shuffle here at the house, and our housemate Daniel has been unearthing some absolute relics from the back of his closet.

Herman

Herman Poppleberry, reporting for duty! And yeah, Daniel's closet is basically a time capsule. He came out earlier holding this spindle of discs like he'd just found the Dead Sea Scrolls. It's funny how something so common just fifteen or twenty years ago now looks like an artifact from an ancient civilization.

Corn

It really does. Daniel sent us a voice note about it because he was looking at these M-discs he used to use for backups back when the internet here wasn't exactly what you'd call blazing fast. It got him thinking about whether optical media is actually dead, or if it's just gone underground into these specialized niches.

Herman

It's such a great question because we tend to think of technology as a straight line, right? From floppy disks to CDs, to DVDs, to the cloud, and once we move to the next stage, the old one is supposed to just vanish. But that's rarely how it actually works.

Corn

Exactly. And Daniel mentioned something called WORM media, which stands for Write Once Read Many. He noticed it's still showing up in medical imaging and even some high-level cloud storage architectures. So today, we're going to dive into the state of optical media in January twenty twenty-six. Is it a nostalgic hobby, or is it the secret backbone of the world's most important data?

Herman

I love this topic because it hits that intersection of physics and information theory that I find so fascinating. Most people think of their data as this ephemeral thing in the air, but it always has to live on something physical. And as it turns out, plastic and glass are still remarkably good at holding onto bits and bytes.

Corn

So let's start with the basics for those who might not be familiar with Daniel's specific find. What exactly is an M-disc, and why would someone use that instead of just a regular recordable DVD or Blu-ray?

Herman

Right, so the M-disc is essentially the prepper version of a DVD or Blu-ray. If you look at a standard recordable disc, the way it stores data is through a layer of organic dye. When the laser burns the disc, it's chemically changing that dye to represent ones and zeros. The problem is that organic dye is, well, organic. It degrades over time. It's sensitive to light, heat, and humidity. We call it disc rot.

Corn

I remember that being a big fear in the early two thousands. People would back up their wedding photos to a DVD, put it in a drawer, and five years later, the disc was unreadable.

Herman

Exactly. It was a huge issue. The M-disc creators, a company called Millenniata, decided to solve that by getting rid of the dye entirely. Instead, they used a proprietary inorganic layer resembling stone or glass. Instead of a chemical change, the laser literally carves pits into this rock-hard material.

Corn

So it's basically digital stone carving.

Herman

Precisely. They've done testing where they've submerged these things in boiling water, baked them in industrial ovens, and exposed them to intense ultraviolet radiation. The claim is that they can last for a thousand years. Now, whether we'll have a drive to read them in a thousand years is a different question, but the data itself is theoretically permanent.

Corn

That's a long time to wait for a backup to finish. But Daniel mentioned that he used them because his internet was slow. That's a very real-world constraint that we often forget about in our always-on world. If you have a terabyte of video footage and your upload speed is five megabits per second, the cloud isn't a backup solution; it's a pipe dream.

Herman

Right, and even now in twenty twenty-six, while we have great fiber in Jerusalem, there are plenty of places where the cloud is still just someone else's computer that you can't actually reach quickly. But the really interesting part of Daniel's prompt is the mention of WORM media in industries like medical imaging.

Corn

Yeah, why is that? Why wouldn't a hospital just put everything on a massive server array or a secure cloud bucket?

Herman

It comes down to two things: compliance and the air gap. In medical imaging, like an X-ray or an MRI, you often need a record that is legally guaranteed to be unalterable. If you store a file on a hard drive, even a secure one, there is a non-zero chance that someone, or some piece of malware, could modify that file.

Corn

I see. So the Write Once part of WORM is the feature, not a bug. Once those pits are carved into the disc, you can't un-carve them. You can't overwrite the data to hide a mistake or a piece of evidence.

Herman

Exactly. It’s a physical guarantee of data integrity. In legal circles and medical fields, that’s worth its weight in gold. And then there’s the air gap. A disc sitting on a shelf isn't connected to the internet. It can’t be held for ransom by a group in another country. If your hospital gets hit by ransomware and your entire network is encrypted, those optical discs in the archives are still perfectly fine.

Corn

That’s a powerful argument for old tech. We spent the last decade trying to connect everything to the network, and now we’re realizing that for the most important stuff, being disconnected is actually a security feature.

Herman

It’s the ultimate defense. And it’s not just small-scale stuff. Did you know that some of the biggest cloud providers are actually using optical storage for their cold tiers?

Corn

Wait, really? When I upload a file to a glacier style storage, it might end up on a laser-etched disc?

Herman

It’s a real possibility. Companies like Sony and Panasonic have been developing these Optical Archive systems for years. We're now seeing Generation Three systems that can hold about eleven terabytes in a single cartridge. They look like giant robotic jukeboxes. They have these cartridges that hold twenty-two high-capacity Blu-ray-style discs. When you request a file that’s been archived, a robot arm literally goes and grabs the cartridge, puts it in a drive, and spins it up.

Corn

That sounds like something out of a nineties sci-fi movie. But I guess if you're storing petabytes of data that only needs to be accessed once every five years, you don't want to pay the electricity bill to keep hard drives spinning twenty-four seven.

Herman

That’s the huge why behind it. A hard drive has a motor, a spindle, and sensitive magnetic heads. It uses power even when it’s idling, and it eventually wears out just from the physical motion. An optical disc sitting in a dark, climate-controlled box uses exactly zero watts of power. It can sit there for decades without any degradation. For cold storage, it’s incredibly efficient.

Corn

So, if the tech is so good for the big players, why did it feel like it vanished for the rest of us? I mean, I don't even have a disc drive in my laptop anymore. I think the last time I saw one was on that old desktop we have in the basement.

Herman

It’s the classic trade-off between convenience and durability. For ninety-nine percent of people, the convenience of clicking sync and having their photos appear on all their devices outweighs the risk of the company going bust or a server farm catching fire. We traded forever for right now.

Corn

That's a deep point, Herman. But let's look at the pipe dream part of Daniel's question. Is there a future where optical media makes a comeback for regular people, or even just as a more mainstream industrial tool? I’ve heard rumors about five-D storage and glass discs.

Herman

Oh, now we’re getting into the really cool stuff. This is what I’ve been reading about lately. There’s a project out of the University of Southampton, and Microsoft has been working on something similar called Project Silica. This isn't your grandfather’s DVD.

Corn

Project Silica. I remember hearing about that a few years ago. They stored the original Superman movie on a piece of glass, right?

Herman

Yeah, exactly! They used a femtosecond laser—which is a laser that pulses at one quadrillionth of a second—to create tiny structures called voxels inside a piece of quartz glass. It's not just on the surface; it's three-dimensional. That's where the five-D comes from. They use the three dimensions of space, plus the size and orientation of these tiny structures.

Corn

And how much data are we talking about? Because a standard Blu-ray is what, twenty-five or fifty gigabytes?

Herman

Project Silica is aiming for terabytes on a piece of glass about the size of a coaster. And there's a newer player called Cerabyte that's using ceramic layers on glass to store data at the petabyte scale. The durability is insane. We're talking about thousands of years. It can withstand being boiled, baked, and even scoured with steel wool. It's essentially a permanent physical record of human knowledge.

Corn

That sounds like the ultimate black box for civilization. But for Daniel, sitting at his kitchen table with his M-discs, the question is more practical. Should he keep them? Is there going to be a way to read them in twenty forty or twenty fifty?

Herman

That is the hardware gap problem. You can have the most durable media in the world, but if you don't have the interpreter—the drive and the software—to read it, it's just a shiny coaster. We're already seeing this with floppy disks and even some early CD-ROM formats. The bit rot might not kill the data, but the interface rot will.

Corn

I think about that every time I see an old Zip drive. I have files on those from university that I literally cannot access without buying a legacy drive off an auction site and hoping I can find a driver that works on a modern operating system.

Herman

Precisely. This is why some people argue that the cloud, for all its flaws, is better because the provider handles the migration. They move your data from old hard drives to new ones, from old formats to new ones, without you ever knowing. You're paying for the service of keeping the data alive and accessible.

Corn

But you're also paying for the privilege of them having control over it. If you stop paying your subscription, or if they decide your content violates a new policy, poof, your data is gone.

Herman

And that's the weird niche that Daniel has found himself in. The M-disc is for the person who wants to own their data in a physical sense. It's for the person who doesn't trust the cloud to be there in fifty years.

Corn

So, let's talk about the current market. Daniel mentioned he saw Blu-ray discs on Amazon and thousands of people are still buying them. Who is that? Is it just people like Daniel with slow internet, or is there a physical media counter-culture happening?

Herman

It's a mix. There is definitely a growing community of people who are de-clouding. They've realized that when you buy a movie on a streaming service, you're really just renting it until the licensing agreement changes. We've seen movies and shows just disappear from people's libraries.

Corn

Right, the digital ownership is a lie realization.

Herman

Exactly. So there's a small but very passionate group of people who are buying four-K Blu-rays because it's the only way to ensure they actually own the movie. And the quality is significantly better, too. Streaming bitrates are heavily compressed. A physical four-K disc has a much higher bitrate and better audio.

Corn

I can attest to that. Whenever we watch a movie on disc versus streaming, the sound alone is a world of difference. But what about the professional side? You mentioned medical imaging. Is that still a big market?

Herman

It's huge. In fact, in many parts of the world, if you go for an MRI or a CT scan, they will still hand you a CD or a DVD to take to your specialist. It sounds archaic, but it works. It's a standardized format called DICOM that every hospital system in the world can read. If they gave you a USB stick, the hospital's IT department would probably have a heart attack because of the security risk.

Corn

That makes total sense. A CD is read-only. You can't put a virus on a finalized CD that then infects the hospital's network. A USB stick is a wide-open door.

Herman

Exactly. So optical media is the safe way to transport sensitive data between air-gapped systems. It's slow, it's clunky, but it's secure.

Corn

You know, it's interesting how we often view old technology as worse, but in this case, the limitations are the benefits. The fact that it's slow and hard to change is exactly why it's still used.

Herman

It’s a feature of the physics. But to Daniel’s point about high-capacity optical storage—is it a pipe dream? Well, we’ve been hearing about Holographic Versatile Discs or HVDs for twenty years, and they never really made it to market. The problem is always the same: how do you make the drive cheap enough for a consumer to buy?

Corn

Right. It’s one thing to have a million-dollar robotic jukebox in a data center. It’s another thing to have a fifty-dollar drive in a laptop.

Herman

And that’s where the industry is stuck. We have the tech to store terabytes on a disc, but the lasers required and the precision needed for the tracking are so high that the cost doesn't make sense for a regular person. Why buy a two-hundred-dollar optical drive and twenty-dollar discs when you can buy a two-terabyte portable SSD for eighty bucks?

Corn

But the SSD will fail eventually. The data on it will leak over time if it’s not powered on. It’s called charge leakage. If you leave an SSD in a drawer for five years, there’s a good chance some of the bits will have flipped.

Herman

You’re preaching to the choir, Corn! This is the Data Dark Age I’m always worried about. We are creating more data than any civilization in history, and we are storing it on the most fragile media ever invented.

Corn

That is a terrifying thought. If there’s a major global catastrophe and the power grids go down for a decade, all our digital history is just... gone.

Herman

Unless it’s on an M-disc in Daniel’s closet!

Corn

Exactly! Daniel might be the librarian of the future. But seriously, it sounds like the future of optical media isn't going to be a return to the glory days of everyone having a CD player. It’s going to be this high-end, industrial cold storage solution.

Herman

I think that’s right. We’re going to see glass storage become the standard for national archives, for the GitHub Arctic Code Vault, and for big cloud providers. It’s the forever tier of the internet.

Corn

And for the regular person? Maybe we’ll see a niche boutique market, like vinyl records. People who want that physical connection and that guarantee of ownership.

Herman

I could see that. Limited Edition physical releases of games or movies on high-durability media. It’s a premium experience.

Corn

So, Herman, if you had to give Daniel advice on his M-disc collection, what would it be? Keep them or toss them?

Herman

Oh, definitely keep them. But with a caveat. If those are his only backups, he should probably also have a copy on a modern drive and maybe a cloud backup too. The three-two-one rule of backups: three copies, on two different types of media, with one copy off-site.

Corn

I like that. The M-disc is his long-term insurance policy.

Herman

Exactly. And he should probably buy a spare external Blu-ray drive and put it in a vacuum-sealed bag next to the discs. Just in case they stop making them in ten years.

Corn

That is the most Herman Poppleberry advice I have ever heard. Vacuum-seal a spare drive. I love it.

Herman

Hey, you'll thank me when the Great Cloud Crash of twenty thirty-five happens!

Corn

I'll be knocking on Daniel's door asking to borrow his Superman M-disc.

Herman

But in all seriousness, the state of optical media in twenty twenty-six is actually much healthier than people think. It's just moved out of the spotlight. It's in the X-ray rooms, it's in the high-security government vaults, and it's in the basements of tech-savvy people who know that the cloud is just a fancy word for someone else's hard drive.

Corn

It's the quiet, steady turtle in the race against the digital hares. It might be slow, but it's going to be the one that's still around at the finish line.

Herman

Beautifully put. And I think it’s a great reminder for all of us to think about what we actually own in our digital lives. If you have photos of your kids that you only have on one social media platform or one cloud service, you don't really own those memories. You’re just a tenant.

Corn

That’s a sobering thought. Maybe I’ll go through our old hard drives this weekend and see if anything needs to be etched in stone on an M-disc.

Herman

I’ll bring the vacuum sealer.

Corn

Please don't. But you know, this whole discussion about the durability of physical media vs. the ephemeral nature of the cloud—it reminds me of some of our recent episodes on invisible tech systems and layered networks. We talked about how we’re moving toward these systems that we don't even see or think about, but that also means we lose a lot of control.

Herman

Oh, that’s a great connection. We want things to be invisible and seamless, but the cost of that seamlessness is often our own agency and our own understanding of how things work. When you hold a disc in your hand, you understand exactly where your data is. When it’s in the cloud, it could be anywhere, or nowhere.

Corn

Right. The more layers of abstraction we add, the more points of failure we create. A disc and a laser is a very simple system compared to a global network of servers, routers, and satellite links.

Herman

Simplicity is its own kind of sophistication. I think that’s the real takeaway here. Sometimes the old way is still the best way for specific, high-stakes problems.

Corn

Well, I think we’ve thoroughly explored the weird world of Daniel’s closet today. It’s fascinating to see how these technologies don't just die; they just find their true purpose once the hype cycle moves on.

Herman

Exactly. The CD wasn't just for music; it was a stepping stone to permanent digital storage. And who knows, maybe in fifty years, we’ll be talking about how those old-fashioned quartz glass slabs were the only reason we still know anything about the early twenty-first century.

Corn

I hope so. I hope someone in the year twenty-five hundred finds a piece of glass and sees our podcast on it.

Herman

Two brothers in Jerusalem talking about discs. They’ll be very confused, but hopefully entertained.

Corn

Hopefully! Well, I think that’s a good place to wrap this one up. Daniel, thanks for the prompt and for the trip down memory lane. I’m going to go help him move the rest of those boxes now.

Herman

And I’m going to go see if I can find a femtosecond laser on the second-hand market.

Corn

Of course you are. Hey, if you've been enjoying the show, we'd really appreciate a quick review on your podcast app or on Spotify. It genuinely helps other people find us and join in on these deep dives.

Herman

Yeah, it makes a huge difference. We love seeing the community grow and hearing your thoughts on these topics.

Corn

You can find us at our website, myweirdprompts.com, where we have our full archive and a contact form if you want to send us a prompt of your own. And of course, we're on Spotify and all the usual places.

Herman

Thanks for listening to My Weird Prompts. We'll see you next week!

Corn

Take care, everyone. Stay curious.

Herman

And keep those lasers clean!

Corn

Goodbye!

Herman

Bye! ---