

## MY WEIRD PROMPTS

Podcast Transcript

### EPISODE #177

# Current Chaos: Why Global Electricity is So Fragmented

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## EPISODE SYNOPSIS

Ever wondered why your travel adapter is a bulky necessity instead of a relic of the past? In this episode, Herman and Corn dive into the "Current Chaos" of global power, tracing our fragmented electrical grid back to the 19th-century rivalry between Thomas Edison and George Westinghouse. From the "first mover disadvantage" that locked North America into 110 volts to the aesthetic reasons behind the 50Hz vs. 60Hz divide, they explore how ego, war, and carbon filaments shaped the modern world. They also uncover the story of the "perfect" universal plug that was designed to save us all but fell victim to the ultimate coordination problem. Join the brothers as they unpack why the world is still split by its sockets and whether we'll ever truly be standardized in an increasingly connected age.

## DANIEL'S PROMPT

### Daniel

"I'm a big fan of standardization, like the work the International Standards Organization does for things like currencies and country codes. However, one thing that is not standardized is the type of electricity supply we use around the world. We have different plugs and different voltages, such as 110V in the US and 230V in Europe. Why haven't we agreed upon a common standard? It would significantly reduce electronic waste and the need for transformers. How did these differences in voltage come about, and has anyone ever proposed an international standard for this?"



# TRANSCRIPT

## Corn

Hey everyone, welcome back to My Weird Prompts. I am Corn, and I am joined as always by my brother.

## Herman

Herman Poppleberry, at your service. And man, do we have a deep dive for you today. It is January sixth, two thousand twenty-six, and the world is still as fragmented as ever when it comes to the very thing powering our lives.

## Corn

It really is. Our housemate Daniel sent us a voice note this morning that got us both thinking. He was talking about how much he loves standardization... you know, things like the International Standards Organization setting codes for currencies and countries. It makes life so much easier for data and logistics. But then he looked at his travel adapter and wondered... why on earth haven't we done this for electricity?

## Herman

It is the ultimate "why is this still a thing" question. We have different plugs, different voltages, different frequencies. If you travel from New York to London, your hair dryer might literally catch fire if you do not have the right transformer. It seems so archaic for two thousand twenty-six, right? I mean, we have self-driving cars and A I that can write poetry, but we cannot agree on how to stick a piece of metal into a wall.

## Corn

Exactly. Daniel was pointing out that a common standard would cut down on so much electronic waste and the need for all these bulky adapters. He was looking at the sheer volume of plastic and copper sitting in junk drawers around the world. So today, we are going to look at how we got into this mess, why the world is split between one hundred and ten and two hundred and thirty volts, and if anyone has actually tried to fix it.

### Herman

Oh, people have tried. It is a story of ego, war, and the literal physics of light bulbs. I have been digging into the history of this all morning, Corn, and it is fascinating how much of our modern world is just built on top of decisions made by a few guys in the late eighteen hundreds who were basically guessing as they went. We are talking about the legendary War of Currents.

### Corn

It is that classic path dependency we talk about sometimes. Like when we discussed the persistence of mainframes in episode two hundred and sixty-four... once you build the infrastructure, you are kind of stuck with it. But with electricity, it feels even more fundamental. So, Herman, let us start at the beginning. Why one hundred and ten volts in the United States? Why that specific number?

### Herman

It all goes back to Thomas Edison. When Edison was developing the first commercial electric power distribution system in the eighteen eighties, he was using direct current, or D C. His big invention, the incandescent light bulb, used a carbon filament. And through a lot of trial and error, he found that these carbon filaments worked best and lasted longest at around one hundred volts.

### Corn

So he just picked a hundred because it was a nice round number?

### Herman

Well, he actually went with one hundred and ten volts at the generating station because he knew there would be a voltage drop as the electricity traveled through the wires to people's homes. He figured by the time it reached the actual light bulb, it would be right around that sweet spot of one hundred volts. It was a practical, engineering-led decision based on the limitations of the materials he had at the time. But Edison was also a businessman, and he wanted to control the entire ecosystem from the generator to the bulb.

### Corn

That is wild. So the entire power grid of North America is essentially calibrated to the needs of a nineteenth-century carbon filament light bulb? That feels like building a highway system based on the width of a horse's rear end.

### Herman

Pretty much! And because Edison was the first to really roll out a large-scale system, particularly in New York with the Pearl Street Station in eighteen eighty-two, that one hundred and ten volt standard became baked into the American infrastructure. By the time better filaments came along, like tungsten, which could handle higher voltages, the U S already had thousands of miles of wire and millions of devices built for one hundred and ten. But then, the plot thickens because Edison had a rival: George Westinghouse.

### Corn

Ah, the A C versus D C battle. This is where Nikola Tesla enters the chat, right?

### Herman

Exactly. Tesla and Westinghouse championed alternating current, or A C. The big advantage of A C was that you could use transformers to step the voltage up to thousands of volts for long-distance transmission and then step it back down for home use. Edison's D C system could only send power about a mile before the voltage dropped too low. Edison tried to smear A C as dangerous, even going so far as to publicly electrocute animals to prove his point, but the efficiency of A C was undeniable.

### Corn

So if A C won the war, why didn't Westinghouse just change the voltage to something better than one hundred and ten?

### Herman

Because they were competing for Edison's customers! To win people over, Westinghouse had to make sure his A C system could run the same light bulbs people already owned. So he stuck with the one hundred and ten volt standard to ensure compatibility. It was the first major instance of "lock-in" in the tech world.

### Corn

Okay, so that explains the U S. But then how did Europe end up at two hundred and thirty volts? Did they just wait for the better light bulbs and skip the drama?

### Herman

In a way, yes. Europe started their electrification slightly later than the U S. By the time they were really building out their grids, companies like A E G in Germany realized that higher voltage was actually much more efficient for distribution. They weren't as tied to Edison's early carbon filaments.

### Corn

Right, because of the relationship between voltage, current, and resistance. I remember some of this from high school physics.

### Herman

Exactly. You remember the physics! It comes down to Joule's Law, which states that the heat lost in a wire is proportional to the square of the current. If you double the voltage, you can provide the same amount of power with half the current. And since the loss is the square of the current, halving the current means you lose four times less energy as heat. Or, even more importantly for a growing city, you can use much thinner copper wires to carry the same amount of power.

### Corn

So the Europeans looked at the American system and said... that is a lot of expensive copper you are wasting there?

### Herman

Precisely. In the late eighteen nineties, German engineers realized that if they moved to two hundred and twenty volts, they could save a fortune on infrastructure. They waited until metal filament bulbs... which could handle the higher pressure... became common. By the time the twentieth century rolled around, Europe was standardizing on two hundred and twenty to two hundred and forty volts, while the U S was already too far gone. They had a huge "installed base," as we would say in tech today. Replacing every light bulb and motor in the country would have been an economic nightmare even back then.

### Corn

It is funny because we often think of the U S as being the leader in infrastructure, but in this case, being the early adopter actually led to a less efficient long-term standard. It is the "first mover disadvantage."

### Herman

It really is. And the split got even weirder when you add frequency into the mix. You know, the fifty hertz versus sixty hertz thing. This is the part that really messes with your electronics.

### Corn

Right, that is the other half of the puzzle. Why do we have different cycles per second? I remember we touched on some of the math of timing in episode two hundred and fifty-two when we talked about network latency, but this is a different kind of timing.

### Herman

It is. So, sixty hertz became the standard in the U S largely because of Nikola Tesla. He figured out that sixty hertz was the "Goldilocks" frequency for A C motors and transformers. If the frequency was too low, like the twenty-five hertz systems used at Niagara Falls, the lights would flicker visibly to the human eye. It was like living in a slow-motion strobe light. If it was too high, you had major efficiency losses in the transformers due to magnetic effects.

### Corn

And fifty hertz? Was that just Europe being contrary again?

### Herman

Not exactly. It was more about the metric system, believe it or not. The German company A E G, which I mentioned earlier, had a bit of a monopoly in Europe. They looked at Tesla's sixty hertz and decided that fifty hertz fit better with the metric units they were using. It was a rounder number in their system. They also found that sixty didn't fit their specific generator speeds as well.

## Corn

Wait, so we have a global divide because one guy liked the number sixty and another guy liked the number fifty for aesthetic or metric reasons? That is incredibly frustrating.

## Herman

It gets even more chaotic when you look at Japan. Japan is actually split down the middle. The eastern part of the country, including Tokyo, uses fifty hertz because they bought their first generators from A E G in Germany. The western part, including Osaka, uses sixty hertz because they bought theirs from General Electric in the U S. To this day, Japan has to maintain massive frequency converter stations just to move power across the country. It is a logistical nightmare that has persisted for over a hundred years.

## Corn

That is the ultimate example of why standardization matters. Imagine the cost of maintaining two separate grids in one island nation. But Daniel's point in the prompt was about the waste. Think about the millions of tons of plastic and copper that go into making travel adapters and dual-voltage power supplies. Has there ever been a serious attempt to just... stop the madness and pick one?

## Herman

There has! And this is the part that usually blows people's minds. There actually is an international standard for a universal plug and voltage. It is called I E C sixty-nine-oh-six dash one.

## Corn

Wait, I have never seen a "universal" plug. What does it look like? Is it some kind of futuristic multi-prong thing?

## Herman

It was developed by the International Electrotechnical Commission in the nineteen eighties. It looks a bit like the Brazilian or Swiss plugs... three thin pins in a slightly flattened triangle shape. It is rated for up to two hundred and fifty volts, it is incredibly safe, it is compact... it is basically the perfect plug. If we all used it, you could take your laptop from Chicago to Shanghai to Stuttgart and never need an adapter.

### Corn

So why am I still carrying a brick in my suitcase when I go to London? Why didn't we just adopt it in the eighties?

### Herman

Because by the time the I E C published the standard in nineteen eighty-six, the world was already "plugged in." To switch to a universal standard, every single home and business in the world would have to replace their wall outlets. Every manufacturer would have to change their power cords. The cost would be in the trillions of dollars. There was no immediate "killer app" that made the switch worth the pain.

### Corn

It is the ultimate coordination problem. No one wants to be the first to switch because their devices won't work anywhere else, and no one wants to be the last because they're stuck with the old tech. It is like trying to get everyone on Earth to start speaking Esperanto tomorrow.

### Herman

Exactly. There was a brief window after World War Two when a lot of Europe was rebuilding and they could have standardized. But instead, countries doubled down on their own designs as a way to protect their domestic markets. If you have a unique plug, it is harder for foreign competitors to just dump their appliances into your country. It was a form of non-tariff trade barrier.

### Corn

That is a cynical but very realistic take on it. Protectionism through plastic pins. But surely, in two thousand twenty-six, we are seeing some progress? I mean, the E U has been very aggressive about this lately.

### Herman

You are right. The E U common charger directive, which fully kicked in a couple of years ago in late twenty-twenty-four, was a massive turning point. It forced all small electronics... phones, tablets, cameras... to use U S B C. That has already eliminated an estimated eleven thousand tons of e-waste annually in Europe alone. We are seeing a "soft" standardization happening right now, and it is not coming from the wall outlet. It is coming from the cable.

### Corn

You mean U S B C is becoming the de facto global standard for low power?

### Herman

Exactly! Think about it. Ten years ago, if you traveled, you needed a different power brick for your laptop, your phone, your camera, and your toothbrush. Now, almost everything can be powered by a single U S B C cable. We have essentially moved the standardization layer from the "wall side" to the "device side." The wall still gives you whatever weird local flavor of electricity it has, but the power brick handles the conversion, and the cable is the same everywhere.

### Corn

That is a great point. And those power bricks are getting smaller and more efficient, right? I remember you mentioning something about a new material a few episodes back.

### Herman

Yes, Gallium Nitride technology... or G a N chargers. They are a game changer. Traditional silicon-based chargers lose a lot of energy as heat, which is why they have to be so big. G a N chargers are much more efficient, which allows them to be tiny while still pumping out sixty-five or even one hundred watts of power. They can handle anything from one hundred to two hundred and forty volts and output exactly what the device needs over U S B. We are bypassing the "plug problem" by just making the conversion so cheap and small that we don't care as much about the source anymore.

### Corn

I see what you are saying, but it still doesn't solve the waste issue Daniel mentioned for the big stuff. We are still manufacturing millions of different wall-side cables or regional plugs for those chargers. And for high-power stuff like kettles, hair dryers, or washing machines, U S B C isn't going to cut it. You still need that heavy-duty physical connection to the grid.

### Herman

You're right. For the "big" appliances, we are likely stuck with the current mess for the rest of our lives. The sheer inertia of the building industry is too much to overcome. But I do wonder... if we were starting a colony on Mars today, what would we use? If you have a blank slate, do you go with the U S standard or the European one?

### Corn

Oh, that is a great thought experiment. I bet the engineers would have a field day with that.

### Herman

I think you have to go with the higher voltage, right? Two hundred and thirty volts. It is just objectively more efficient for the wiring. You save on copper, you have less heat loss. And you would definitely go with sixty hertz because it is slightly better for motors and completely eliminates any chance of light flicker.

### Corn

So the "perfect" system is a hybrid of the two? European voltage and American frequency?

### Herman

That would be the engineer's dream. But on Earth, we are stuck with our history. It is like the Q W E R T Y keyboard. It was designed to slow down typists so the mechanical arms wouldn't jam, and now, even though we use digital screens, we still use that same layout because our brains are "wired" for it. We are victims of our own success.

## Corn

I actually want to push back on the "safety" aspect for a second. I have heard people argue that the U S one hundred and ten volt system is actually safer because if you get a shock, it is less likely to kill you than two hundred and thirty volts. Is there any truth to that, or is it just American cope?

## Herman

It is a bit of both. It is true that a shock from one hundred and ten volts is generally less dangerous than two hundred and thirty volts because there is less "electrical pressure" to push current through your body. However, the U S system compensates for that lower voltage by requiring higher current for the same power. Higher current means more heat in the wires, which actually makes house fires more likely if the wiring is old or faulty.

## Corn

So it is a trade-off between "less likely to electrocute you" and "more likely to burn your house down"? That is a grim choice.

## Herman

In a very simplified sense, yes. But then you look at something like the British plug... the Type G. Have you ever really looked at one of those, Corn?

## Corn

The big chunky one with the three rectangular prongs? I have stepped on one in the dark before. It is like a four-sided die. It always lands points-up. It is the Lego of the electrical world.

## Herman

It is a lethal weapon on the floor, but as a piece of engineering, it is a masterpiece of safety. It has a built-in fuse in every single plug. It has shutters on the wall socket so kids can't stick paperclips in there. The prongs are partially insulated so you can't touch them while they are live. It is arguably the safest plug in the world, but it is also the most over-engineered and bulky. It was designed during a time of copper shortages after World War Two, which led to the "ring main" circuit design in British houses. Because the circuit could carry so much current, every individual plug needed its own fuse for safety.

## Corn

It feels like that is the story of this whole topic. Every region optimized for something different... safety, cost, early adoption, or domestic industry protection. And now we are the ones who have to carry the adapters. It is a testament to human ingenuity and human stubbornness all at once.

## Herman

It really is. And to Daniel's point about electronic waste... think about the millions of transformers inside our devices that exist solely to step down that voltage. If we had a single standard, we could simplify the internal power supply of every single electronic device on Earth. We would save billions in manufacturing costs and reduce the carbon footprint of every gadget.

## Corn

But wait, don't most modern electronics use "switching" power supplies that don't need a heavy transformer anyway?

## Herman

Yes, exactly. That is what I was getting at with the U S B C thing. Modern switch-mode power supplies are incredibly clever. They basically "sample" the incoming electricity at very high speeds and only take what they need. That is why your laptop charger can work in both Japan and Germany without you flipping a switch. We have solved the "transformer" problem with silicon instead of heavy coils of wire.

## Corn

So in a way, the "need" for a global standard is actually decreasing because our tech is getting better at handling the chaos. We have engineered our way around the lack of cooperation.

## Herman

That is the irony. The more "fragmented" the world stays, the more we rely on clever silicon to bridge the gap. It is a "workaround" that became so good we stopped trying to fix the underlying problem. It reminds me of what we talked about in episode two hundred and eighty when we discussed AI reasoning models... sometimes we don't fix the core logic, we just build a more complex layer on top of it to handle the edge cases.

### Corn

That is a deep cut, Herman. But it's true! We are living in a world of "top-down" fixes for "bottom-up" problems. So, if someone were to propose an international standard today... let us say the I S O or the U N really got serious about it... what would be the biggest hurdle? Beyond the cost?

### Herman

Honestly? I think it would be the "smart home" transition. Right now, in twenty-twenty-six, we are in the middle of re-wiring our lives with smart switches, dimmers, and integrated appliances using protocols like Matter. If you told people they had to replace their three-thousand-dollar smart fridge or their entire home automation system because the country was switching to a new plug standard, there would be a riot. We are more "locked in" now than we were in the nineteen fifties.

### Corn

Yeah, I can see that. Back then, you just had a toaster and a lamp. Now, your house is a computer that happens to have a roof. But what about the move toward D C power? I have been reading about how solar panels and home batteries are changing things.

### Herman

That is the real wildcard! Our solar panels produce D C. Our batteries store D C. Our LED lights and computers run on D C. Right now, we are constantly converting D C to A C to move it through the house, and then back to D C to use it. We lose about ten to fifteen percent of our energy in those conversions. Some visionaries are proposing "D C Microgrids" for homes. Imagine a house that runs on forty-eight volts D C with U S B C ports in every wall.

### Corn

Now that is a vision I can get behind. No more bricks, no more prongs, just a universal port for everything from your phone to your television. Imagine a world where you move to a new country and the only thing you have to pack is a bag of cables. It would be a minimalist's dream.

### Herman

It would be glorious. But until then, we are stuck with the legacy of Edison's carbon filaments and A E G's love for the metric system. It is a messy, beautiful, frustrating testament to how we build our world. We don't build it perfectly; we build it on top of what came before.

### Corn

It really is. I think Daniel's frustration is totally justified, but the "why" behind the mess is just so human. It is not that we are incompetent; it is just that we are very good at living with the consequences of our past self's decisions. We are a species of adapters... literally and figuratively.

### Herman

Well said, brother. And hey, for everyone listening... if you have ever been frustrated by a travel adapter or wondered why your hair dryer sounds different in another country, you are not alone. It is one of the great unsolved puzzles of the modern age. It is the physical manifestation of our history.

### Corn

Definitely. We would love to hear your thoughts on this. Have you ever had a "voltage disaster"? I once plugged a U S power strip into a European outlet with just a physical adapter and watched it melt in about thirty seconds. Don't do that, folks. If you have stories or think we should just bite the bullet and switch to a universal standard, reach out to us through the contact form at [myweirdprompts dot com](http://myweirdprompts.com).

### Herman

And while you are there, you can check out all our past episodes. We have been doing this for a long time... two hundred and eighty-two episodes now! We have covered everything from the math of magic to why mainframes still run the world.

### Corn

And if you are enjoying the show, it would mean a lot to us if you could leave a review on your podcast app or Spotify. It genuinely helps other curious people find us. We are just two brothers and a housemate trying to make sense of the world, and we love having you all along for the ride.

**Herman**

Absolutely. A quick rating or review really does make a difference in how these platforms show the podcast to new listeners. So, thanks for being part of the community.

**Corn**

Alright, I think that is a wrap on the great voltage divide. Thanks again to Daniel for sending in the prompt... even if it did make us realize how much copper we are all wasting.

**Herman**

Until next time, keep asking the weird questions.

**Corn**

This has been My Weird Prompts. We will see you next week.

**Herman**

Stay curious, everyone!

**Corn**

So Herman, before we go, I have to ask... if you had to pick one plug to rule them all, which one is it?

**Herman**

Oh, the British Type G. No question. It is a tank. It is safe, it is sturdy, and it makes you feel like you are actually "connecting" to the power of the universe. Plus, you can use it as a defensive weapon if a burglar breaks in.

**Corn**

I knew you were going to say that. You just like things that are over-engineered and heavy.

**Herman**

Guilty as charged! But seriously, the fuse in the plug is a genius move. It protects the device and the house. Why did everyone else decide to skip that?

**Corn**

Probably because they didn't want to carry around a brick just to plug in a lamp! And stepping on one is worse than stepping on a Lego.

**Herman**

Fair point. Efficiency versus safety... the eternal struggle.

**Corn**

Alright, let us get out of here before you start explaining the history of fuses.

**Herman**

Too late, I have a whole book on it! Did you know the first fuses were just thin lead wires?

**Corn**

Save it for episode five hundred. Bye everyone!

**Herman**

Bye!