

Atomic Comics: Evolving Depictions of Science in Comic Books and Popular Culture

KAREN WEATHERMON: That looks-- yes? OK. And this is for you guys. OK.

I know this is going to seem sort of odd because I'm talking to a microphone, and you're not necessarily hearing me amplified. But this is for our friends on Global Campus who are also with us for this talk today.

So I'm really delighted to have you here today. I'm Karen Weathermon. I'm director of first-year programs. And on behalf of my colleagues in the Office of Undergraduate Education and everyone who works in common reading in some way, we want to thank you for coming today.

This is one of a full-year series of different kinds of events that connects in different kinds of ways to our common text this year, which is *Soonish-- 10 Emerging Technologies that will Improve and/or Ruin Everything*. And we are especially pleased to welcome, also, our friends joining us virtually-- live streamingly from Global Campus too. So for those of you in the room and those of you outside the room, thank you so much for taking some time to come in today.

Mark's talk today-- Mark O'English from Manuscripts, Archives, and Special Collections-- this talk is actually one of a little collection of events happening this week and next week that involve the genre of comics. And *Soonish*, of course, is a book that combines comics and text. So in these two weeks, we're looking at the form as well as the contents of the book to say, OK, how does that form add to our understanding of different kinds of events? So I just want to let you know about the rest of the things in this small series.

Next Thursday, February 14, visiting comic artist Mita Mahato will be talking about the art of comics at 3 PM in the Jordan Schnitzer Museum of Art. And also, next week from February 12 through 16, the museum is hosting a one week special pop-up exhibit of comics called, *Rekindle*. And you can receive common-reading credit for both of those events.

Next week on the 12th, there is also an event at 4:30 in Q203 that will be about study abroad and study away, also for common-reading credit. And they join, also, an ongoing exhibit by Michael Schultz at the art museum. So there are lots of things happening, but I especially want to point out the comics ones. And information about them and all the other events coming up the rest of the spring are available both on our common-reading CougSync page and on the common-reading website, which is commonreading.wsu.edu.

If you are attending for common-reading credit, we will have you card swipe in at the end of the event this afternoon. So that will show up as credit for you for whatever course you're taking for which attending a common-reading event counts for you.

This happens to be an event in which getting credit for it is a two-part endeavor. You'll card-swipe as you are leaving today, and that will send an email link to a very short survey that will come to you at whatever email you have linked to your CougSync account. Completing that short survey then will allow this to show up in your CougSync involvement page. If you have any questions about that, you can contact us.

Anyway, and there are also instructions about how to find that link if it doesn't immediately show up on your email on our common-reading website page. So we appreciate your taking a few minutes to give us some feedback that allows us to get some feedback to Mark, but also, for us to know how to direct the program as we're going forward.

So now I want to introduce our speaker today, Mark O'English. Mark is the university's archivist, which means he works with Manuscripts, Archives, and Special Collections, otherwise known as MASC, over in the Holland and Terrell Library. If you want to visit MASC, you go in the front doors and down either of the sets of stairs into that round atrium area below the kind of you know glass whatever you'd call that-- skylight, dome. And MASC is just off of that area.

The current exhibit in MASC is on the 100-year history of the WSU fight song, which Mark curated and put together. And I encourage you to check out that exhibit this spring while it's up.

Mark came to library and archives to work from a science background. And originally here at WSU, he served as the librarian to most of WSU's engineering programs before he began his work in archives.

When Mark was working on his library degree, his childhood love of comic books paid off when he spent several years working as a writer/researcher on Marvel Comics reference publications. I should also mention that WSU has several extensive collections of comics. So if this afternoon's talk sparks some interest for you, I am certain that Mark would be happy to have you walk over to Holland and Terrell and show you some of those collections. In fact, those collections are also what it's being used for the pop-up exhibit that will be happening next week over in the museum.

Mark gave a version of this talk several years ago, and it was just a fabulous talk. So I know you're in for a treat with lots of visually interesting images to sort of hook together this idea of how science has been portrayed in popular culture, especially through comics. So please help me welcome Mark, and enjoy the next hour.

MARK O'ENGLISH: Well, hello. Firstly, they've got me double miked as well. You guys can hear this in the back they're? No? Yes. OK, cool. Thank you very much.

Yeah, my name is Mark O'English. I'm the university archivist here. And I'm going to talk a little bit about how comic books have portrayed science in popular culture.

Karen mentioned I used to work for Marvel. I was a freelancer for about 10 years. I did not write the comic books. I did not write Fantastic Four and such not. But what I wrote for were a series of what they call The Official Handbook of the Marvel Universe.

And the idea was we would put together histories of all the characters of the Marvel universe, some of those pretty insane long histories, some of much more short. If you're writing something like Spider-Man, you would literally have to go and read every single appearance of Spider-Man ever, which is 2,000, 3,000 comics easily at this point. Most of them, you're reading 10, 50, 100 comic books. And in doing this, over the course of 10 years, I started to see a lot of recurring patterns in the way things were dealt with, the way comic books looked at certain aspects of science.

When I came and worked at MASC, I got to see some of the but older stuff that's there. One of our retired English professors, a gentleman named Paul Brians collected what he called "atomic comics," which I stole for this. They were basically comics dealing with nuclear issues, dating from '50s up to about the point he retired. There are hundreds of these over there.

And let me look a little bit back at the past. So I love to talk about how our view of science evolved over the years. I'm a comic-book nerd, so I'm talking about pop culture and comic books because I know comic books fairly well. I love comic books.

I know some of you are probably here because you like comic books. That's great. I know some of you are probably here because you want that extra credit. Or an instructor assigned you to come, and you don't care about comic books. That's fine. I'm not insulted.

But what I would ask in that case-- I'm going to talk about popular cultures portrayed in comic books. If you're a movie fan, think about some of what I'm saying in terms of movies, books, children's books, animation, whatever.

AUDIENCE: [INAUDIBLE]

MARK O'ENGLISH: Ask them. Can you see it? You need lights down up here? Anybody? Seems like we're good as is.

So this is some of the things I just put together-- some of the ways that science has been portrayed in various genres over the years-- in video games, certainly, old science fiction; 50s movies; comic books that I love; fiction; animation. Board games are up there, children's books, all sorts of stuff.

When I was a kid growing up-- I'm a little older than most of the students here. I was born in 1964. So I was growing up in the '70s as a kid-- the 80s; '80s as a young adult. And probably the imagery-- I grew up-- the visions of nuclear science came from things like comic books very specifically-- that's in 1976-- comic-book heroes powered by radiation. I grew up with the monster movies that became popular in the '50s and '60s. Them as an army of giant ants--

irradiated giant ants marching through New Mexico after some nuclear testing-- think Godzilla, things along those lines.

A little bit darker-- 1984, *The Day After*. For those of you who don't know that, *The Day After* is an ABC TV movie. And basically, it was a look at Kansas City after the US and Russia had launched a nuclear war on each other. Nuclear bombs had fallen, and it's intended to be a very realistic look at what life would be like for somebody dealing with radiation dealing with the destruction, dealing with the types of things going on.

That colors my views on science growing up with those very light, very dark, very goofy things. You guys today-- I occasionally wonder what you're growing up with his kids and as young as adults as views of nuclear science and nuclear issues. One of the ones that I always come back to is the ubiquitous, *The Simpsons*, which is the goofy view of nuclear science. Everybody pictures Homer Simpson at the nuclear facility having accidents right and left, leaving, in the credits with radioactive material bouncing down his back, not taking radiation all that seriously.

Maybe more seriously, I was thinking about this one recently-- 2010, which you guys would probably be at a point of remembering in your formative years. We had a tsunami in northern Japan which did major damage-- killed many, many people-- but damaged one of the nuclear reactors there.

One of the things that we saw here in the Northwest thereafter, quite a bit for the following days, were these lovely types of charts where you would see slip streams across the air telling us how much radiation was heading for the Northwest. These scary-looking charts all in deep red-- that's where it's going to be in three days, that's where it is in six days. Even back then, we knew the science meant that this wouldn't really have any serious effect on us, per se. But nonetheless, on the news, in the papers we would see these lovely charts because they want your website clicks, they want you to tune back in. And I kind of wonder what growing up as a kid with that one of your first exposures to nuclear science [INAUDIBLE] what that might do to you guys a little bit.

So like I say, I'm a comic-book nerd, but some of these other genres-- think a little bit about what's there-- comic books-- we really date to about 1938, at least for the superhero stuff. There were some strips before that. There are some other things, but in 1938, we get Superman in *Action Comics*. 1939-- Marvel Comics comes along. The Human Torch, Sub-Mariner, Captain America follow shortly thereafter.

That said, nuclear science, nuclear issues predate that certainly. I am not. She said I have a science background, but my science background was in mathematics and psychology. I'm not a nuclear scientist. You're not going to get hard physics here, so be gentle on me if I mess something up-- but a brief background before our comic-book era.

Dates back to 1870s is when we start seeing X-rays come around. In the following years, we see X-rays being used to treat cancer. We discover more of the science behind it, we discover burns

and hair loss. By the time we get down here, this is the stuff I love, where you start seeing radiation causing mutations within fruit flies. And then we see that that can be passed down to successive generations. Although realistically, it usually kills them, and if it actually does pass down, it makes them sterile.

So what did pop culture do with nuclear issues in these areas? Nuclear radiation is fun in an era before ubiquitous energy everywhere, and before everybody having electric lights, electric power-- something that you could-- something that you could look at, and it would give off warmth in your hands, a little glow if you did it right. This is cool stuff. So people were kind of enamored of the idea of radiation.

This is an article from a Popular Science Magazine. You would see something-- you go to the bookie today, probably, and Popular Science magazine just as seriously talking about science issues. And they're talking about, will radium destroy youth? It'll give you a longer life, it'll give you a new hair on bald heads-- kind of ironic, given what we now know about the effects of radiation-- a renewed vigor of youth.

If you look closely at this, it will tell you that this woman is using a device which is supposed to irradiate your water in your home to make a little bit more warm and a little more comfortable for you to drink-- real products, real things. All three of these products around the side were real products you could purchase. I do not know how ubiquitous they are.

Radithor, certified radioactive water contains radium and mesotherium-- something you could drink at home. I love the schokolade, German chocolate with radium in it. You could go out and find that out there. Or my favorite-- the 15-day course of vita-radium suppositories. That'll make your insides nice and warm for you.

Yeah. Radiation is cool. Radiation-- the science of the future. We were just talking about picturing the Soonish book 100 years ago-- might have, radiation is one of the technologies that's going to change the future of our world.

This, of course, changed 1945-- August, 1945. The US had been involved in World War II since 1941. The war had been going on before that. August, 1945, we drop a couple of nuclear bombs on Japan-- one on Hiroshima, one on Nagasaki.

I suspect you guys-- my voice has even got a little deeper talking about this. I suspect you guys, from the point of view of 2019, growing up when you are-- when I say the point of view-- our impressions of nuclear issues changed as a result of this-- you think we start going, oh, look at all the people who died, look at how dangerous this was, and we started seeing it more seriously, it was very much the other way. We had been involved in World War II for four years. Everybody knew somebody who was off fighting in the war-- had brothers, cousins, husbands, uncles, whatever. This classroom-- if we were here in 1943, it would be 90% women, 10% men because all the men were off fighting in the war.

What the nuclear bombs did was they brought home our brothers, our sons, our fathers, our family members. This was a triumph of American science. Once the nuclear bombs went off, we loved radiation, we love nuclear bombs. It was a wonderful thing.

I have to say, I'm talking about this from a historical point of view, trying to look at different generations looked at it. So please don't ascribe anything I'm saying necessarily to me as my point of view. But this is what we saw in our popular culture.

This is Atoman, a comic book that was published in February 1946. The bomb dropped in August, 1945-- so seven, or eight, nine months before that. Today, if you tried to get a comic book from script, drawn, off to the publisher, or off to the press, back to the publisher, out on the stands, you're probably talking a bare minimum of six months. Back then, it probably took just as long. So this really had to have been started almost immediately after the bombs dropped.

And it really is-- there's no doubt about it. I'm radioactive. Evidently my body is so geared as a result of working with radium and uranium. They can explode atoms and give me atomic strength. This is how we viewed nuclear issues after a nuclear bomb. So it's going to make a better world for all of us. I completely lost where I was about to go there for a second.

One of the things I love very much here on campus-- If you were to go to a dance in 1946, it's not like today, where you just show up and dance with whoever. They're very rigorous, very scheduled. You would have a little dance card you would get with slots of all the dancers, and you would fill out who you would make an appointment with-- the women or the men you're going to dance with, fill it out, and that's how you would spend your evening.

There is this junior prom of 1946 here-- has an atomic fantasy theme. There's a little orange mushroom cloud in the back of the spot where you sign all your names on it. And today, that sounds ironic at best, bad taste it worse. But then, I'm pretty sure it was very earnest and very straightforward. Nuclear bombs, nuclear issues were important things, good things for the country, good things for us.

As I talk about these things, I'm going to start talking about, well in 1946, they started thinking this. And in the 1970s, they seemed to think this. All of those things are generalities. Things come in, things go out. Things pop up earlier, things pop up later.

One that actually really kind of shocked me in this-- this is a February 3rd 1946 comic book. It's The Spirit done by a gentleman named Will Eisner. He's considered to be the father of graphic novels-- one of the real founding fathers in comic books.

The Spirit is a hardboiled-detective type. He writes a story where the spirit is investigating. I don't actually know the whole story behind it, but he's dealing with nuclear scientists who, toward the end of the story, pull a switch, actually trigger a nuclear bomb. We cut to the far-off distant space, where a little planet of humanoid aliens sees a star flash up in the distance as

Earth explodes, destroyed, and cut to the Spirit's supporting cast waking up there on a park bench, where he'd been dreaming the whole thing.

I would not be surprised to see this comic in the '70s, '80s, '90s, 2000s. I'm shocked to see this comic in February of 1946 because we have, like I say, almost universally wonderfully positive points of view, here in the US, at least, on the nuclear bombs and what we're going to see from that. Kind of interesting to me.

After World War II, it's hard to talk about how superhero comics dealt with nuclear issues because we kind of stopped having superhero comics. Superhero comics were, more or less, during World War II, arranged around the war, people went out and fought Nazis, people were stopping Hitler. We were sick of that after four years of the war. We didn't want to see people fighting anymore. Superhero comics kind of died away a little bit.

We started getting romance copies-- true crime-- copies? Comics-- true-crime comics, western comics, things along those lines, where you did see nuclear issues. They were still fun-- played for humor, play for positive things. There's a Charlton atomic bunny, who's radiation-based.

I love Donald Duck's atom bomb, a little Disney thing. Donald Duck decides to invent his own atom bomb, but it's not going to go boom. It's going to go [PFFT] instead. I'm not quite sure why that's significant.

All his atom bomb-- all his [PFFT] bomb-- ultimately does is makes everybody's hair fall out, which again, kind of ironic when you think about that almost a almost common theme there. And at the end of it, he's kind of chased out of town by the upset townsfolk, as tends to happen with Donald Duck-- so played for humor.

But by the mid 1950s, late 1950s, we start seeing a negative perception of nuclear issues-- atomic bombs, atomic issues in the comic books. Almost just from the other-- even without looking at this, you can see it's gotten darker just from the colors. All of a sudden, there's reds, blacks, yellows.

These, by the way, these panels come from these three comics-- Atomic Spy, Atomic War, Atom-Age Combat. These are some of the Paul Briens comics I mentioned that MASC holds over there.

And you can, if you read the captions here, they say things like, "To permit our atomic muscles to grow flabby while striving for peace would rarely invite atomic attack by an enemy stronger and less responsible than ourselves." Above it, it says, "We must not be ostriches and bury our head in the sands in the face of danger."

Why are nuclear bombs all of a sudden darker, less positive? Because in the 1950s, the Russians developed their own nuclear bombs. The science of none of these issues has changed.

The exact same science is there. What's changed is that now, instead of an example of US success, they're a danger. They're an example of something bad that can happen to us here in the US. So the public zeitgeist start changing on these things, and we see it in our pop culture as we start seeing darker images of nuclear materials.

I'm going to jump to science just for a second. With the Russians also involved in nuclear issues, the US takes it a little bit more seriously. We start doing a lot more testing. This is where you see the pictures of the bombs in the South Pacific being detonated on those lovely films.

Again, this is where we get a little bit more attention to those mutations. We start seeing it with all those animals involved, and fish in the Pacific, insects in the desert. Again, realistically, scientifically, they die. If they don't die, they pass on something so their kids die.

We do see, sure, things come out a little bit bigger, different things happening with them, but fatal. But it doesn't stop us from taking that science and running with it.

So here, Marvel we've got Grottu, King of the insects-- a giant ant, giant radioactive spider, giant radioactive scorpions, giant octopus attacking the city. There's a scarlet beetle taking on the Ant Man, one of my favorites. "Save me from the weed," as our plant life comes to life, grows to giant size, and begins attacking us here.

Again, I'm not sure how scary these really were. It's actually about as scary as comics could get in this era. But again, we're taking our science off a little bit of an edge to it.

Some of it you take to complete extremes. I'm still not sure how radiation makes this big blue robot come alive and start attacking people. Even more ridiculously-- oh, he's taking his time coming up there. There we go.

Farmer's scarecrow that grows to giant size and begins lumbering through the countryside-- someone explain the science between the mutations that cause that to me. I would be fascinated.

But the stuff you guys probably know better-- we see Godzilla comes to life in movies. And we get a lot of these radioactive monsters entering our popular culture. That's one of my favorite Godzilla issues. This is more from the '70s, when he came to Marvel as being written there. But there's the Space Needle being eaten by our favorite giant dinosaur.

Like I say, not just in the comic books do we see this stuff. This is another one of those Popular Science magazines-- fairly serious about its science, seriously discussing, how can nuclear radiation change the human race? I love this. It talks somewhere in this area here, "the atomic war producing an entire new species of men," the quote below, "Now hear this, Earth! I am mutant man, homo superior. I've been created by radiation forces our of the loins of you, the human" Royce after your-- "race"-- good Lord, excuse me-- "by the human race after your great and terrible Atom War."

Down below that, it says, "Will this voice someday thunder over the world from a mutant man, not a human being"? We start getting this idea in our science a little bit that, yes, it can affect humanity. We don't know if the future mutants are going to be friends, big-headed friends-- oops, sorry-- big-headed friends down there, big headed foes up there. Apparently, we just know they're going to get big heads out of it.

I'm a little bit fascinated by this comic for side reasons because this is 1954. For those of you who are comic-book nerds and are familiar with the X-Men, which came about eight years later-- '62 or '63-- they steal this language almost verbatim. They use the term "mutants." The X-Men are humans who have inherited genetics from their parents which caused them to develop superhuman powers.

They are commonly talked about in the comic books as the "next generation of the human race-- what human race is going to become." And you see the bad guys, like, Magneto talking about how he is-- literally, they use the phrase, "Homo superior" is how Magneto describes mutants, with the intent of going through and replacing the human race. So the X-Men develops these us-versus-them themes of the next generation taking over, which just fascinated me. I still wonder if Stan Lee, at some point, read this because the theft is so direct out of here seven or eight years later.

So Stan Lee, who I just mentioned, I'd like to hope the whole world knows who Stan Lee is at this point. But Stan Lee is a writer for Marvel Comics, who, in 1960s, basically revolutionizes superheroes. He is pretty much given credit for at all. He worked with a lot of authors-- a lot of artists who deserve a good chunk of that credit. But Stan Lee is the guy who was the writer and took most of this.

This is one of his first new wave of comic books. This is the Fantastic Four, a group of four astronauts-- launched themselves into space trying to beat the Russians into orbit, or to the Moon, or whichever it was.

And while they're up there in space, their ship is penetrated by these "cosmic rays" they call them. Ship crashes back down, and they gain superhuman powers. One can turn invisible, one can burst into flame, one can stretch, one becomes an overgrown monster of sorts.

So we're seeing, all of a sudden, radiation in a way, be very positive again, which is kind of odd, because we saw it get a little bit darker as the Russians gained the ability to do the stuff as well. Why is it all of a sudden positive here? And I kind of wonder if I can attribute that a little bit to Stan Lee grew up.

Stan Lee, in his 20s-- he was in his 20s in the 1940s and was sucked into the war effort, as were pretty much all of the artists who were there at the same time. So Stan Lee is of the generation that radiation issues, atomic bombs-- that type of thing-- are US science proud that saved the world and made things safe for humanity in the sense that the United States is all of humanity that matters. Again, sorry. Trying to look at it back there. Please don't take that as my own

particular point of view. It's a very US-centric point of view we have, certainly in these areas before communication was easy an instant around the world.

So in any case, so we see very much positive points of view of radiation to those issues coming out of Stan Lee sorry-- yeah, Fantastic Four, a couple movies in recent years that sucked, unfortunately. I love the Fantastic Four, but-- virtually everything Stan Lee does in the early days draws on radiation, draws on science.

We have, up here, nuclear scientist, Bruce Banner, working on a gamma bomb. We can't just have a nuclear bomb. We have to-- gamma bombs, cosmic rays have to be bigger, cooler, stronger. In any case, as he's working on his bomb, teenager races, drives into the nuclear test site on a dare. Bruce Banner races into the test site, throws the kid into a trench just as the bomb goes off. He is exposed to gamma rays, becomes the Incredible Hulk, big green monster. Well, initially, a big gray monster, but eventually, a big green monster.

Down here, young boy sees an older man, a blind man about to be hit by a truck, dives in front of the truck, pushes the man out of the way. The truck driving through the middle of New York City is carrying radioactive materials, as probably happens all the time. And it's so well packed that the radioactive materials come bouncing out of the back of the truck, hit the kid in the face, blind again. But at the same time, the radiation affects his body. He gains advanced hearing, advanced taste, advanced senses of touch, which lets him become the superhero Daredevil.

Everybody knows this guy up here-- science nerd Peter Parker. Goes to visit a science experiment where they're showing radiation. Spiders there get exposed to radiation, bites Peter Parker, and we get the amazing Spider-Man. Really, a big thing.

I mean, everything is derived around radiation-- not all uniformly positive. All of our villains are derived from radiation as well. Up here, quick a few of them-- a very few. Dr. Octopus is working with these artificial tentacles, radioactive accident fuses them to his body-- literally, the radioactive man.

The abomination, the leader, both get gamma powers, just like the Hulk does. The Hulk's cousin, Jen Walters, has to get a lifesaving blood transfusion from the Hulk, becomes the She-Hulk. Cobalt man, cobalt radiation.

One of my personal favorites-- the Texas Twister. The idea is he's a rodeo cowboy out riding the range in the west. There's a tornado that sweeps through a nuclear facility, becomes radioactive, sweeps through, picks him up. He gains tornado powers and can fly around in a tornado, blast little tornado blasts out of his hands. Yeah, a little bit ridiculous, but all based around this, science does cool things-- makes us bigger, better, faster.

And of course, the Hulk-- or the Hulk-- how did I say that? The X-Men, who are, as I talked about earlier, mutants. Their parents were exposed to radiation, passed down genetic changes.

Not strictly mutants as we would have seen the definition earlier because their bodies do different things than their parents did. But nonetheless, the next generation of humanity gained weird powers through radiation through science.

I'm a Marvel nerd. I'm talking almost exclusively about Marvel here because I did all that research. I know Marvel stuff.

It was far from being just Marvel. Captain Atom from Charlton Comics; Firestorm, DC; Doctor Solar-- Man of the Atom from Gold Key Nukla from Dell. Everybody did this. It does not all follow Stan Lee two. Of those at least-- maybe three-- pre-date Stan Lee. So it was the generation.

I say Stan Lee had this opinion of science quite possibly from his generation, but you have to think about the entire generation of people creating comics grew out of that environment. So we see this wave affecting our pop culture based on what people grew up with.

Action comics-- I've got Superman in the middle. You're probably going, why is Superman there? He's 1938. And we always know he's not a super-science hero. We know he's Kal-L from the planet Krypton.

But for those of you know Superman, you know how his powers work, right? He's irradiated by the yellow sun. His powers come from the radiation of the yellow sun. Take Superman off Earth, drop him on a planet with a red sun, all of a sudden, he no longer has powers. So there he is. Even the ones who are like aliens from another planet work a lot around science and the importance of radiation-- nuclear-type issues.

As always, we take you to extreme levels of goofiness. I always have to include this in here. This is one of my favorite comic books. This is Fantastic Four, issue number four, which is 1961 or 1962.

And what that comic does is reintroduces a 1940s character called the Sub-Mariner. The Sub-Mariner was an aquatic hero in the 1940s, like our current Aquaman out in the movies. He has amnesia for many years is what the comic says. That's why we haven't seen him.

So he wakes up from his amnesia, goes back to his home in the South Pacific, finds out Atlantis has been destroyed in the nuclear testing that we're aware of. So he declares war on the surface world and attacks New York City. Sends a big, giant whale monster to demolish the city.

Fantastic Four can't do much about it because they're pretty small compared to it, so they come up with a plan. They strap a nuclear bomb to the back of the thing, have them Jonah into the whale-- walk into the whale's mouth into his stomach, where he unstraps the atomic bomb, leaves it behind, walks out. And they set off the nuclear bomb inside the creature on the wharfs of New York City. And all's fine. Sub-Mariner gives up, goes away.

I like to think, even then, they realize that setting off a nuclear bomb on the wharves of New York City might potentially be a bad idea, but it's hard to say exactly how they were looking at these issues back then with the 50-some years. What is that? 55 years that have come and gone since then?

It does get darker again after Stanley's boom. Post-Holocaust comics are probably one of the next nuclear-related trends we see. This would be the 1970s-- most of these.

Planet of the Apes is the one that everybody knows. It's the best example of the post-Holocaust genre. It was originally a book, then it was originally a movie, and then a series, a movie, comic books in there.

But the basic idea-- we have moved from-- we were looking at the US having a bomb, Russia having a bomb, Fantastic Four having a bomb. We're looking at a bomb or a few bombs. A bomb is wrong there-- but one bomb or a few bombs.

By the time we're looking at this post-Holocaust stuff, nuclear bombs are common enough that we're starting to look at the effects of what happens with a lot of nuclear bombs-- the idea that when the US and Russia are going to war-- there was a term for it back then-- "mutually assured destruction" is why they wouldn't launch it each other because they knew if they launched, the other side would retaliate, and the world would be destroyed.

If you went to school here in the '50s and '60s, there would be signs on some of the buildings. I've seen pictures of Holland Library-- the old entrance to it-- with a big bomb-shelter sign over the entrance so you'd know where you could go. We have some lovely maps in MASC you can come in and see from 1960s which are civil-defense maps that shows, based on where you live near the campus in the city of Pullman, which campus buildings you're going to go to when the nuclear bombs hit so that you can survive the nuclear war and come out of it afterwards.

It's almost a little ridiculous today. I hope it's a little ridiculous today. But it is a genuine fear that we lived with back then. And you start seeing it making its way into pop culture.

Planet of the Apes, Kamandi-- The Last Boy on Earth is a DC comic book. Obviously, you can see post-Holocaust. In fact, you can't get more self-referential post-Holocaust than the Statue of Liberty there. They're obviously going for the end of The Planet of the Apes with that one. Deathlok-- The Demolisher, a cyborg in a post-apocalypse world in the far future, by the way, of 2019, which is always kind of fun for me. That's when most of Deathlok took place.

Let's see, other issues we looked at at the time now that we realized nuclear bombs were really a threat to humanity as a whole, not just a threat to individuals-- atomic terror-- a pretty a pretty common idea, the idea that someone's going to destroy the whole world to their own benefit. Up at the top, we have a guy named Arkon who came from another world. His planet's sun was dying, so he came up with this plan to destroy-- a nuclear fire-- three other worlds and

drain all of their power into this big vortex that would repower his sun. So he was going to destroy the Earth and a few other worlds to benefit himself.

Lucifer's an X-Men villain who, I think, was just trying to exterminate humanity out of vengeance. But again, nuclear destruction. Null, the Living Darkness was in a comic book called The Defenders, a very Lovecraftian villain. And his idea was he was going to control the minds of the Russian military and the US military, get them to launch missiles against each other, and then feed off of the pain and the agony of the human race as it dies and suffers thereafter.

Yeah, there's a really positive, fun comic. It's a little bit better than that when you read it, but that's the basic idea-- a very Lovecraftian thing-- Again the idea that this destruction can happen as a result of all these bombs.

That's mostly '70s, '80s you see a lot of that-- the height of what we call the "Cold War." Starting even before that in 1960s, running after into the '90s-- you can probably still find examples of this today-- nuclear blackmail. Is usually more one bomb thing-- the idea that I have a nuclear weapon. And I'm going to use it to destroy your city unless you pay me \$1 billion-- something along those lines-- very common in a lot of comic books. And as you get, there are probably, movies, even in the more recent decades here, although that one's very ironic. Dr. Evil is also the plot I think with about every third James Bond movie in the '60s.

As we move forward a little bit, nuclear activism is one that I kind of like the idea behind. The writers who came of age in the '60s and the '70s-- there were kids growing up then who started writing comics in the '70s-- we really saw a push, in the '70s, of younger writers coming in, and the older writers who been around since World War II leaving the industry.

But these new writers come in-- young pups. And they had seen what was going on in the country in the '60s and '70s. There was a lot of activism on the part of the youth of the country. They were out there protesting US involvement in Vietnam, Cambodia. They were out there protesting the way the was treating African-Americans, Chicano Americans, Native Americans. And it looked to them like they were making a difference. I still like to hope they were-- get my own politics out of it though. But these people who believed in activism thought it was successful, started writing comic books, where you see the general public-- not just the superheros-- standing up against what they saw as wrong-- in this case, some of the nuclear issues going on at the time.

I talk about the generational gap as you see these things. If you go back into those times in the late '60s and early '70s when the student activism was new, you can find comic books written by the older generation which view the activists as rabble rousers, and, more or less, the villains of a variety of comic books back then. So it's kind of a gradual sweep as these things happen, but each generation kind of has its own view on things. That kind of carries through as the comic books go along.

Very much along those times-- I just realized I can't see a clock in here. Ah, there we go. OK.

As we move out of the Cold War, about 1989, the Soviet Union falls, and we stop having this feeling within our own lives that we can all die at any moment because we could have a nuclear war. And I'm going to talk about my own self being a kid for a minute.

I can remember-- I grew up in Klamath Falls, Oregon. I lived about three miles from an air base there, which was not a primary target in case of a nuclear war, but it was considered a secondary target. The bombs would hit. And I have a very strong memory of one day being out on the streets of the city at about noon, and the air-raid sirens started going off. And I just kind of stopped and looked around, and nobody else was doing anything. It was just a test. And I guess the adults knew that.

But I remember-- I mean, this is strong enough that as a kid, I thought for a moment there, is this it? Is something happening? So it was. It's probably hard. I hope it's hard. I hope you kids today-- sorry about the "kids" phrase, but the younger people, young adults today haven't grown up with that and don't see that.

But so as that went away, we started seeing things a little bit more, where we kept the nuclear stuff, but it was more terrorism, more the stuff that was believable is instead of countries going to war and nuclear war, individuals acquiring nuclear weapons and using them to advance their own political ends. Obviously, that's something we can see today. I don't know. It makes a little more logical sense. It's closer to our impressions today. Certainly, we have experience with terrorism of other sorts today.

I always include I-- have nuclear-waste disposal on here. I don't know if it's just me growing up in the Northwest, where we have Hanford and we know that there are issues of nuclear-waste disposal. And it seems like something that's important to me, but I don't find it in comic books, oddly enough. It seems like something that should be there.

I think maybe the Teenage Mutant Ninja Turtles get their powers out of nuclear waste that's dripping into the sewers there. That's about all I can come from. I can give you a couple reasons maybe people don't do it. Maybe growing up in the Pacific Northwest, I'm just too close to it, people growing up in New York City-- it's not an issue to them.

The other end of comic books are very graphic very intentionally. I'm literally drawn-- genre-- so we want to do something big and splashy. And if you're doing a nuclear story, probably actual nuclear bombs that splashed here-- the nuclear waste.

I still want to see something done with nuclear waste in comics. As we move even further out of this, we start seeing very personal stories dealing with nuclear issues, I call them "atomic traumas," where we see the day-to-day things that people are involved with-- how it affects our own lives.

This is the comics called the Squadron Supreme from the 1980s. There's a character in it called Nuke. He is very intentionally a direct rip-off of DC Firestorm, who you saw on a cover earlier.

Nuke has radiation-based powers, flies, blast radiation. And his parents are both terminally ill. And in this comic book, he discovers that the reason they're terminally ill is radiation poisoning. His superpowers have been killing his family for years, and he hasn't realized it because-- cancer is something we can relate to in a different way than we can relate to some of the other nuclear issues we've been seeing going on. By the end of the issue, in kind of a combination of a rage spiral and self-destructive anger, he manages to kill himself in the middle of a big fight.

Another one, more recent, from the 2000s Firestar, a Marvel radiation-based superhero-- very much a goofy, fun character. If you grew up in the '80s, '90s, there's a comic, a Saturday-morning cartoon, Spider-Man and His Amazing Friends. That's where Firestar debuted. Firestarter, Iceman, and Spider-Man were a happy, fun, fighting team together.

She has radiation-based powers, and we discover, in the 2000s, that they've given her cancer. And she has to deal with the effects of that. We start seeing a little bit of the realities of radiation dealt with in a very human matter, which we didn't tend to see earlier in the '70s.

Speaking of dealing with things in a very real manner, I'm talking about American comics which have American point of views very distinctly. If you go to France, you'll see different point of views. If you go to China, you see different point of views.

This is the point of view of a young gentleman who was about seven or eight years old in Hiroshima when the bombs fell. And he drew a comic. But this is going to be a little graphic in here, and I apologize for this. But he's seven, eight, nine-- somewhere in there-- off to elementary school when the bombs fall-- when the nuclear bomb falls in Hiroshima.

He happens to be standing, when they fall off in that direction, with his back to a very thick stone wall. So he experiences a blinding flash. He experiences incredible heat, a strong shockwave. He loses consciousness, wakes up, actually, with a nail stuck through his cheek that he has no idea where it comes from.

And then the rest of this of autobiographical comic books tells us what his life was like there immediately thereafter and moving forward in his life. The destruction that he saw in Hiroshima-- dead people. It's the lady. Her skin's all black and falling off.

There are some observations that you would never in a million years think about. People wearing white clothes weren't burned so badly, but their skin melted where it was exposed. However, if you were wearing black clothes, the black absorbed the heat, and your skin melted inside the clothing as well. Yeah. He helps with the cremation, learns that human bodies bake the same way fish bake-- talks about finding bodies where they jumped into water tanks in a desperate attempt to cool down because of the burns that had affected them.

This is a very, very different point of view-- the room gets very quiet-- a very, very different point of view from what we just saw-- the US point of view of the nuclear bombs after the war. So I have not read much in the way of Japanese comic books. I'm going to bet, though, you're

not going to see the same popular evolution of the view of nuclear issues in Japanese comic books as you move forward in time over there. Yeah.

I want to close with one particular comic book, two short stories from it-- two stories from it-- Watchmen. For those of you who don't know Watchmen, Watchmen is a 12-issue comic book from 1986, 1987 written by a gentleman named Alan Moore, drawn by a gentleman named Dave Gibbons. It's considered one of the really classic comic books ever made. It was made into a movie in 2009.

And the basic idea behind Watchmen-- this is '86, '87. The Cold War is going to end in '89, so we are still at the height of the Cold War-- the idea that Russia and the US could go to war at any moment. His Watchmen has a history that dates back into the 1940s, very much along the line of comics, where people dressed up in gaudy costumes and fought bad guys. But they didn't have superpowers. It was just kind of a thing society was doing back then.

When the atomic bomb was dropped on Hiroshima, this young gentleman is impressed by it. He goes off to work in Los Alamos, New Mexico, on the atomic projects there. Something goes wrong while he's there. There's about to be a nuclear test. He is locked into a room with a nuclear test, and there's no way to either open the door-- that's a safety precaution-- or stop the test. So as he's in there, under the horrified eyes of his girlfriend outside the room, the explosive device goes off, and he's literally disintegrated there.

Over the next few months, there's this odd effect going on. They see this hazy cloud floating around. It's like the place is haunted.

Within a few months, they start seeing what appears to be like a human nervous system just floating in the air, later on, what appears to be muscles, but no skin floating in there. Basically what is happening, is over the succeeding years, he is reconstituting himself, becoming the world's first superhero-- very much nuclear-powered person. This being Alan Moore, it's very dark. Is not going to be one of those light, fluffy superheroes we see, like the Fantastic Four.

But before I go any further on that, I want to go back and tell you a real story. This is Dr. Louis Slotin, who was a scientist, Los Alamos, Mexico, May 21, 1946. And I have to do a little science here, which I'm mean to be bad at because I'm not a nuclear physicist. I apologize.

But if you want to get the effect of a nuclear explosion, you have to have sufficient amounts of a visionable material to do it. If you're trying to make plutonium explode, if you have a small amount and effectively trigger it by applying energy to it, it won't trigger. But if you put two small amounts together and achieve what you call "critical mass," apply that energy, you can set it off and cause an explosion, a chain reaction that keeps growing.

As they're doing science to try to figure out exactly how this worked, they have to test some of that stuff. So what they do-- if you see this little hemisphere on the bottom there-- that's

effectively a cup with some radioactive material, fissionable material-- something along those lines-- in it. The top one is the same thing. It's a smaller cup with fissionable material in it.

Nothing will happen with them unless they're close enough together that they achieve critical mass. To test this, what they're doing is they're keeping them apart with a screwdriver, holding one off of the other, and raising and lowering them to see what happens. Yes, 1940s science.

What happens on this particular day as Dr. Slotin is doing this is the screwdriver slips. The two fall together, a reaction starts, mass energy is being output. Somehow-- we don't know if it's an accident, we don't know if it was he realized what was happening-- almost instantaneously, he knocks this off onto the floor, ending the reaction and saving the lives of all of these other men who are in the room.

However, he was standing right next to it, and he spends the next seven or 10 days dying a very miserable death in a bed there, as his organs literally liquefy, his bones fail him. And he dies. He's reported to be the second person dying doing science testing these type of things. Obviously, a lot of people died in Hiroshima and Nagasaki from these things before that.

Does that sounds familiar, though? I have no doubt that Alan Moore knew this story, and this is something that affected him as a kid and affected, then, how he told stories in the future. He saw the horror of that, and when he comes up with this character based on that, it is not a light and fluffy character. It's so much darker-- he's not a villain or anything, but it's still a much darker storyline that comes along.

Again, as a result of the science or stories of science we're exposed to as children, it affects our future generations. And this becomes enormously popular. I'm sure it's affecting future generations today and how they tell stories.

I am going to try, try, try, try not to spoil the end of Watchmen for those of you who haven't watched it, who haven't read the comic books. But I have to tell you the main plot of it to make this point. So the basic idea behind Watchmen-- I've already told you the US and Russia hate each other, we're on the verge of nuclear war. It's a slightly more dour reflection of reality as it stood at the time.

So what happens in the Watchmen is someone who has the bright idea that the only way we're going to get the US and the Russia to stop going after each other-- the US and the Russia-- the US and Russia to stop going after each other is to provide them with a more powerful third enemy that they can ally against. So what he does is genetically creates a giant monster, a giant space alien. And his plan is to drop in the middle of New York City and set off a psychic blast that is going to kill pretty much the entire population of New York City instantly.

With the big alien there-- this is very obviously going to be a big alien thing-- the US and Russia will come together, and that will resolve the US-Russian conflict. That's the plan. That's the main plot behind Watchmen. I'm not going to go into what works and what doesn't there.

Cut to 2009, 22 years later, they make a movie of Watchmen. We come to the end of Watchmen, and we don't have the idea of an alien popping down in New York City. The plot, in this one instead, is they're going to set off a nuclear device in New York City. They're actually going to flavor the nuclear energy with Dr. Manhattan's energy, so it'll look like Dr. Manhattan did it. He will be the overarching giant threat that the US and Russia have to ally against. And it's basically the same plot and stuff. We're using nuclear materials-- nuclear bomb, more or less-- instead of that.

The interesting question to me is, why? Why is an alien here? Why is it a nuclear bomb there? You can come up with comic-book reasons for this. Solid reasons for this-- comic books are a very graphic phenomena, an alien is a very graphic image. So maybe that's why they wanted to do that then. Maybe they thought that trying to do this with 2009 animation is going to look too goofy and take people out of the movie.

But one of the things that strikes me is that Alan Moore had to do this. He couldn't do this in 1987. The problem with nuking New York City in 1987 is that if you nuked New York City in 1987, the US has to assume Russia did it, and they have to immediately respond by launching their own missiles. This plot in 1987 destroys the world. This plot in 1987, with a simple change of your beast, saves the world, which is kind of fascinating to me that just the zeitgeist of our popular culture can change what we can view as possible.

I know HBO is doing their own Watchmen series in 2019, which should be coming out some time this year. I find myself very curious how they're going to end the Watchmen-- if we're going to see that, if we're going to see that. I suspect, with 10 years, not enough time has passed that our popular culture is going to force us to do one thing or another, but just in the past week, I'm starting to wonder, as the US has dissolved with Russia, its nuclear limitation treaty, and now, both countries can build whatever they want in nuclear weapons-- are we going to see, moving back toward this, where we start seeing the fear of mutually assured nuclear destruction coming in the world? And how is that going to affect, once again, the next generations going forward?

So that's more or less what I just want to talk about with you-- the way some of these things change over time. We see amazing Spider-Man back in 1961, get powers from the bite of a radioactive spider. If you've seen the movies that came out 2000, 2010, Spider-Man now gets his powers from genetic engineering on the spider.

The spider is no longer radioactive. For whatever reason in our culture, we don't believe-- or we don't feel it's believable that radiation will do it, but we feel genetic engineering is believable. I'm not sure. But there's something about that that has changed the way we look at this over the years.

The Hulk, on the other hand-- gamma bomb back in the early 1960s-- still gamma bombs today. We're OK with big, giant nuclear bombs creating marauding monsters. That doesn't give us pause for thought even.

Black Panther-- not so directly radioactive. The basic theme behind it hasn't changed. Wakanda, in the comic books, had a giant mound of weird mineral that called vibranium that let them do different things. It's not hard to see in the 1970s, 1960s by-- is an analogy of radioactive nuclear science-- plutonium, that type of thing-- still stuck around today, it's a giant mound of uranium.

But we don't see most of the same qualities of vibranium that we see back here. This is almost just like a pseudoscience basis for everything. We never are given, well, why does vibranium do this? What are the properties of vibranium?

I'm almost fascinated by that because it's almost like science has been turned into mysticism in a way. Maybe we don't have the same faith in science that we did back then. But I don't know. I'm kind of curious to see-- I'll have to wait and see what I feel that really means as we go forward here in time and how that affects future generations who have grown up with this vision of comics in their pop culture. Make sense?

So that's kind of what I wanted to come here and talk about-- that evolution. I'd like to thank you all for coming and listening to me today. I'll be happy to take any questions if there are any. Otherwise, thank you all for coming.

AUDIENCE: [INAUDIBLE]

MARK O'ENGLISH: They want you to use the microphone if you don't mind. Sorry. Filming in the back.

AUDIENCE: [INAUDIBLE]

MARK O'ENGLISH: Is that on?

AUDIENCE: Half question and half comment.

MARK O'ENGLISH: It's not on yet. Sorry. Could you turn-- turn it-- yeah, I didn't turn it on. I just handed it to Karen thinking she would. Sorry.

KAREN WEATHERMON: Sorry.

AUDIENCE: It's sort of half question, half comment that-- because you talked about pop size, like popular-science magazines, which are definitely out of the realm of comic books, and their portrayal of nuclear science. I'm kind of curious, taking it one step further, how nuclear science was treated in textbooks correspondingly as-- how the drama of this affected what was actually portrayed in textbooks, which may not be a question you can answer, but I'm kind of pondering as I think about this.

MARK O'ENGLISH: Yeah, unfortunately-- did you get that by the way back there? Could you hear that? OK. Yeah, unfortunately, I'm not enough of an expert on the evolution of science to speak to how textbooks did deal with it. I bet you there's very much the same.

And you saw in the '50s, plans for us to do really innovative and cool things with nuclear bombs. One of my favorites is dropping them on the Alaskan coast to create artificial harbors so that we could build towns on the Alaskan coast by creating nuclear craters. And I suspect there are some of the same type of thing in the textbook because that was serious science. It was things they we're really considering doing.

But I haven't looked at them. I would be fascinated to see that evolution myself.

KAREN WEATHERMON: [INAUDIBLE] Let's thank Mark once again.

MARK O'ENGLISH: Thank you.

[MUSIC PLAYING]