**Technology of early moving images**

**Video Script**

**Fa20/Sp21**

**Intro slide**

Welcome to our first *content* lecture!

Get ready to lock in, take notes, learn all about very early moving images,

And become utterly infatuated with the man in this slide.

Over the next few lectures, in addition to learning about the *stuff* of early media history,

We’ll also be learning a few different *lenses* to look at media history.

Today’s lens is technology.

**Key terms**

Each lecture I give this semester will start with a list of key concepts

These are the things I’d like you to walk away from (or really…click out of) this lecture understanding.

However, I’m not going to spend a lot of time reading through these because,

Thanks to the magic of the internet,

You can just pause me to copy them down.

So – here ya go, and on we go.

**Who invented motion pictures?**

The question I would pose to you at the beginning of this lecture is:

Who invented motion pictures?

When I’ve asked this question to other groups of students, I tend to get about three answers:

**[Animation]**

Thomas Edison, New Jersey’s finest;

Sometimes people have heard of the Lumiere brothers, so I’ll get a few of those;

And recently I’ve gotten people mentioning some dude they heard about on true crime podcasts

Who Edison supposedly had killed?

Yeah. I mean—citation needed on that last one—

But my point is just that people tend to have one answer for this question in their head,

Even if they disagree on who the inventor is.

But to answer this question, we have to go way further back than the late 19th century.

**Phenokistascope (gif)**

We have to begin thousands of years ago.

**[Animation]**

For as long as people have had eyeballs, they have delighted in creating the illusion of motion.

We find examples of optical toys and tricks that go back to ancient Iran and China,

**[Animation]**

And our modern motion pictures are connected to this history of play.

Let’s take a look at an example.

**Chinese lamp**

Here’s a diagram of a Chinese “trotting-horse” lamp whose invention dates to about 1000 ACE

—while I don’t think this sketch is exactly authentic to its aesthetics,

it does describe the mechanism accurately.

So, how does it work?

**[Animation]**

The there’s a flame in the middle that creates both light and heat

**[Animation]**

And the heat makes these four li’l horse dudes revolve,

Which projects a moving image on the wall of the lamp.

You get a simple shadow of a moving image—maybe not *Tenet-*caliber cinema

(Or maybe it is, who knows what *Tenet* even is, *Christopher*)

But still an impressive accomplishment given that it’s over a millennium old.

**Phenakistascope**

There are tons of other optical toys that simulate motion in more elaborate ways.

**[Animation]**

This is a gif of a phenakistoscope disc from roughly the Victorian era, so the 19th century.

These were circular illustrated discs you spun and looked at through a slit,

Which made the illustrations appear as though they were moving.

This phenakistoscope disc was recorded and digitized by Dick Balzer, a collector of optical toys and

Not a hilarious name I made up, I swear.

**[Animation]**

Other examples of optical toys include the poorly-named Newton disc,

Which is just a circle divided into wedges of each color of the rainbow.

When you spin it, your eye combines the colors and you see a white disk.

There’s also kid classic the kaleidoscope

(you know, that tube with the colored beads and mirrors that you look through)

And the thaumatrope…

**Thaumatrope**

Which is an illustrated disc attached to two pieces of string.

When spun, the images on each side appear to merge into one—

Here, TA Johnny Depp is perplexed by the illusion of the bird sitting in the cage.

**Zoetrope**

An important step toward cinema was this device, called the zoetrope.

Such an important step, Francis Ford Coppola & George Lucas named their production company after it.

The zoetrope was invented and perfected by many people across the 19th century,

But it was patented in the US in 1867 by Milton Bradley corporation.

The zoetrope is made up of a hollow, spinnable cylinder with slits cut in the sides.

You put a band of sequenced illustrations on the inside of that cylinder, spin it,

And then look through the slits.

The slits keep the images from blurring together,

and that combined with the speed of the spinning cylinder

produces what looks like a moving image.

So, basically, you spin this drum, you look through the slits, and you see the little person inside dance.

On the right, some other zoetrope strips that would produce different images.

**Masstransiscope**

One of the coolest applications of the principles of the zoetrope that I’ve ever seen

Is a piece of public art called the *Masstransiscope,* created by Bill Tyler in 1980.

He used an abandoned subway station across from a working subway line in New York City

And turned it into a working zoetrope from the perspective of users riding the train.

Here’s a video of the piece, which you can still see if you are ever in

New York riding the B or Q train in BK.

**Zoetrope (again)**

I want to return for one second to these zoetrope strips,

Because as I was putting this lecture together I found this image

And, like, okay, cute, bouncing balls, a clown of some kind, a whale and a bird…

[**Animation]**

But what the hell is this one?? It says in the corner “the result of the Grecian bend”

And it looked like a lady falling over, or something?

So, down the rabbit hole I *went*.

**Grecian Bend illustration**

I was able to find another image that included the rest of the image,

…which only made it *weirder*, because it was a lady turning into a camel??

So, as it turns out, the “Grecian bend” was the name for a popular style of dress for rich and fancy ladies

In the mid-1800s.

They would wear these corsets that were super tight, and high heels, and then these huge bustled dresses,

With all of this fabric lumped up right over their butts,

So the result was that they kind of walked hunched over—

The literal *height* of fashion was to look like you had thrown your back out.

**Grecian Bend songs**

Apparently this joke about ladies looking like camels was a popular one because

Darwin had just published *Origin of Species,* so this was kind of a riff on that.

And the ridiculous style also inspired at least *two* songs,

Including this one called “Grecian Bend: She Stoops to Conquer.”

Zero of this will ever be on a test, I just wanted to share this as a demonstration of the bizarre gifts

History will bring you, like a cat with a dead bird on your doorstep, if you just keep Googling.

**Magic Lantern**

Okay! Back to motion pictures. So, the zoetrope and other optical toys worked to animate

A sequence of images…but only one person could see them at a time.

The magic lantern was one of the earliest image projectors that could entertain a crowd,

And with a little skill, it could simulate motion.

According to the Magic Lantern Society, which is a society and not a thing I made up,

It’s basically a slide projector that was invented somewhere in the 1600s,

probably by Dutch scientist Christiaan Huygens, though it builds an even earlier invention

Called the camera obscura.

**Magic Lantern 2**

The magic lantern could only project weak images using either lamplight or sunlight

Until the discovery of limelight in the 19th century—which was hella dangerous,

But also made the projected images much brighter.

Magic lanterns were incorporated into live shows, where performers would tell a story

Illustrated by the illuminated slides which, by using multiple projectors or slides,

Could be made to seem like they were moving.

**BFI video**

Let’s watch a little piece of this video from the BFI about magic lanterns

With a demo by a current magic lantern enthusiast.

**[Play video.]**

**Eadweard Muybridge**

Of course, we couldn’t have gotten to motion pictures without the invention of photography

And the photographer perhaps most responsible for bridging that gap is this man, Eadweard Muybridge.

Muybridge is, as my mom would say, *a character*.

He was born in the U.K. but came to the U.S. in 1850 to work as a bookseller.

He was in a terrible stagecoach crash here in Texas in 1860,

Returned to England to recuperate, but then returned to the American West in 1867.

Friends said that the head injury from the crash changed his personality, more impulsive and emotional.

He traveled for some years around the West, calling himself Helios,

and taking photographs and developing them in a mobile darkroom.

He also shot and killed his wife’s lover—though he was acquitted on the grounds of justifiable homicide.

Like I said: a *character.*

Where Muybridge intersects with the history of motion pictures is in 1866-1867

When he was enlisted to settle a highly debated question posed to him by Leland Stanford,

Former governor of California, and a racehorse owner.

And that question was…

**Question**

…do all four of a horse’s hooves ever leave the ground when it runs?

How much time have you, in your life, dedicated to this question?

Probably zero minutes, right?

Well, up until then, this was like a hotly debated question.

Like: should pineapples be on pizza, chicken or the egg,

which Chris is the best Chris (Hemsworth), and do horse’s feet all leave the ground

were all debated with the same fervor.

And, though you might not have noticed this in the past,

artists were really guessing when they drew horses for centuries.

**Two horses**

These horses appear to move their two front legs separately while keeping their back legs stationary,

Like an inchworm.

**Horse with plow**

This…is not correct.

**Tapestry**

The Beyeux tapestry skirts the problem by just hiding a whole mess o’ horse legs behind each other

**Delacroix**

This is my favorite painting of a horse

I feel like this needs no further comment.

Just sit in silent awe of Delacroix’s masterpiece.

**Horse stills**

Muybridge settled the question by setting up a series of cameras with strings

That a horse would trigger when he ran past them.

The result was the first experiment in high speed photography

And (while this isn’t the exact set of photos from his first experiment),

This similar Muybridge motion study proves that yes, indeed,

There is a moment in a horse’s stride where all four feet are off the ground.

**Muybridge studies**

Muybridge spent the rest of his career improving high-speed photography

with faster shutters and better film

And taking photographs of how animals and people move through space

And demonstrating how motion can be capture in a series of still images—

Which is exactly what a movie is.

**Solnit**

Your reading for today is the introduction to the book *River of Shadows* by Rebecca Solnit,

In which she thinks about how 19th c. technology like Muybridge’s high-speed photography

Changed our concept of space and time.

The transcontinental railroad made previously unfathomable distances much more traversable.

The telegraph allowed people to communicate nearly instantly, unlike a postal letter.

And Muybridge’s photography slowed down time, allowing us to stretch out a single moment.

The technology that led to motion pictures “made it possible to step in the same river twice,

to see not just images but events that had happened in other times and other places,

almost to stop living where you were and start living in other places or other times.”

**Zoopraxiscope**

Turning back to technology, this is where

Muybridge crosses paths with a more well-known name: Thomas Edison.

The credit for developing motion pictures so often goes to Edison and Edison alone,

But he built on the work of others—including Muybridge—and many of his inventions were

Developed by people worked for him.

So, where do Muybridge and Edison meet?

Muybridge was giving all these lectures about his high-speed photography all over the country.

In order to jazz them up, he invented a device called the zoopraxiscope.

It kind of combines a magic lantern and a zoetrope—

Images from his photo sets were painted onto a glass disc, spun,

And then projected onto a wall so everyone could see them.

Edison thought this was the *shit*. He met with Muybridge after seeing a zoopraxiscope demo in 1888

And together they actually discussed creating a complete motion picture *and* sound system.

**Timeline**

So, 1888, these guys meet up and begin to brainstorm what we know today as motion pictures

Edison takes that idea back to his laboratory in New Jersey and assigns it to William Dickson,

One of his employees.

Dickson spends three years developing the kinetograph, or Edison’s movie camera,

And the kinetoscope, or Edison’s first movie player.

I highlighted the ends of these words because you’ll see them again in Edison’s inventions,

And it might help to know that for the most part when he says “graph” it’s something that records,

And when he says “scope” it’s something that you use to view.

Dickson also develops 35mm film, the medium on which Edisonian moving images are recorded.

So Dickson does all of this stuff, Edison is like “I invented movies” and in 1891

The film *Dickson’s Greeting* debuts.

They play it for a bunch of women’s clubs and they are just delighted with this amazing

Cinematic triumph. The story is engrossing. The special effects are daring.

**Dickson Greeting**

Hold onto your butts, and get ready to have your world rocked by one of the most incredible films ever.

**[Play Dickson Greeting.]**

**Timeline**

The response from the women’s clubs is promising enough that they continue making films

And building kinetoscopes

And in 1894, the first Kinetoscope parlor opens in New York city.

**Kinetoscope parlor**

This is a picture of a different parlor in San Francisco around the same time

That the Holland Brothers opened theirs in New York, but they’re similar enough to give you

A good idea of what they looked like.

To watch a kinetoscope film, you’d put your face up to the machine and peer inside.

A kinetoscope parlor had two rows of machines, and each machine showed one film on a loop.

For $0.25 you could watch all the little films in one row; it was $0.50 to see everything they had.

It was maybe five minutes of entertainment.

For reference, in 1894, $.50 would get you a ticket to a whole night

of live entertainment at a vaudeville show.

It’s like buying a phone *just* to watch 10 tiktoks.

**Kinetoscope guts**

Here’s what the inside of a kinetoscope looks like—

The film is on this long reel, and it’s fed through the machine.

**Black Maria**

Edison might not be an inventor, but he was certainly a shrewd businessperson.

Seeing the demand for these films, he does two things:

One, he patents every square inch of his technology to protect his share of this new industry.

Second, he builds the Black Maria, the first film studio, in New Jersey

That’s what you see here.

A Black Maria was slang for those old-fashioned police wagons, and you can kind of see it.

Actually, Edison didn’t like that name and kept calling int “the Doghouse,” but everyone

Was very “stop trying to make fetch happen” about it and the Black Maria stuck.

They began cranking out content to satisfy the unquenchable thirst for new films.

He records all kinds of short films, and starts inviting popular entertainers to the Black Maria

Knowing that featuring celebrities will surely drive interest in his films.  
That’s how you get *The Kiss,* starring May Irwin*,* that we watched yesterday.

Let’s watch a few more of these very early movies.

**Ghost Dance**

This is a film called Ghost Dance from 1894, that is supposed to depict a Sioux dance

These performers were part of the travelling Buffalo Bill stage show,

And while this is kind of an aestheticized, spectacularized version of an indigenous culture,

And this is likely the first motion picture of Native Americans.

**Boxing Cats**

Here’s some light animal cruelty for you.

Boxing cats was one of the most popular attractions at Professor Welton’s cat circus,

Which also included cats on bicycles and cats walking through fire.

Just gonna put this out there—I am dubious about Professor Welton’s academic credentials.

I wanna see his diploma.

**Fred Ott’s Sneeze**

Here’s a reminder from more than a century ago

Why masks are so helpful in stopping the spread of Covid.

Also, believe it or not, this is the first copyrighted film.

The Library of Congress wasn’t even sure *how* to copyright a motion picture,

So William Dickson sent a series of all the still photographs.

Years after the film was lost, we were able to reconstruct it from those photos.

**Eugen Sandow**

And here, the piece de resistance of Edison’s early films—

Strongman of my heart, Eugen Sandow.

I just cannot get enough of this guy.

Sandow, also known as the modern Hercules, was Florenz Ziegfeld’s first star.

(Ziegfeld ran an incredibly popular and successful on-stage variety show called the Follies.)

Sandow was a strongman, so at first his act was lifting tons of heavy stuff, and breaking chains.

But Ziegfeld quickly realized that the audience was way more into his muscles than his feats of strength.

So, Sandow pivoted, added some new elements to his act that they called “muscle display performances,”

Which is what you’re about to see.

I love this so much! Look at him go.

**Theatrograph, etc.**

While kinetoscopes were wildly popular,

the problem with them was that only one person could see it at a time.

I mean, that was *mostly* a problem. I often wonder if Eugen Sandow would be quite so popular a subject

If you couldn’t enjoy his little be-Speedoed muscle display on a loop alone, not looking at anyone else.

Regardless, in the mid-1890s, *many* inventors in several countries were working on different systems,

Some of which functioned as both cameras and projection systems.

This shift to projection allows motion pictures to become a mass form of entertainment

Edison’s assistants Jenkins and Armat invent his projection system the Vitascope in 1895.

R.W. Paul also debuted a similar system in 1896,

And the Lumiere Brothers invented the cinematograph—a combined camera and projector—

In 1895.

We’re going to focus on Edison and the Lumieres.

**Vitascope**

Edison debuted his projection system in April of 1896.

Thanks to this advertisement,

I was able to go back and find a newspaper article depicting that exact event.

And that article is *shady.*

I’d like to read a little bit of it to you.

**Quote**

“No one was more pleased at the success of his work than the great inventor himself.

Wrapped in a big overcoat which hung to his heels and rose to his hat brim,

He walked about the cold room chuckling and joking with the men who had done so much

To make his work what it is.

The figure of a girl dressed for a skirt dance was thrown upon the screen. The delicate colors

Of the shimmering silk were shown as distinctly as though a calcium light were being thrown upon a

Living dancer on a real stage. Mr. Edison watched the effect with much interest.

Then he walked close to the screen to note more precisely the effect of the draperies and the flesh tints

On the arms and face of the young woman. As the graceful figure showed now and then when

the yards of silk were sent floating high in the air, Edison smiled. Then, as the dancer smiled

and brushed away the locks of curling hair which had fallen over her eyes during the dance,

the inventor clapped his hands, and turning to one of his assistants said:

*That’s good enough to warrant our establishing a bald-head row, and we will do it, too.”*

**Quote 2 (with highlights)**

So, what can we take away here?

So. Edison is basically a blowhard in a floor-length fur coat, the boss who shows up

Right at the end of all the work to take the credit.

This reporter in 1896 knows that Edison didn’t invent the Vitascope,

even though history has turned him into the sole inventor of everything that came out of his lab.

Second, he was noting the “flesh tints” on the image of the dancer.

That means that the film was *not* black and white, and we’ll talk about why next week.

And third, a *bald-head row* was the nickname for the section

Of a theater where all the rich, old, bald guys would buy expensive tickets.

So basically, he’s just drooling over all the money he’s going to earn.

Edison! The Bezos of his day.

**Cinematograph**

But over in France, the August and Henri Lumiere had developed a different system

That enabled them to do different things.

They developed the cinematograph, a light, portable camera that also served as a projector.

Because Edison’s kinetoscope was so bulky his films all had to be shot in theBlack Mariah,

The Luimiere’s had an advantage in being able to take their camera out into the world.

They held their first public movie screening in December of 1895, beating Edison by a few months,

And their film depicted a bunch of workers leaving a factory.

Let’s look at a couple of their early films.

**Train**

If you’ve ever heard the legend that early filmgoers were terrified by a movie of a train,

Believing it was going to hit them,

This is the film that legend referred to.

**[Play film]**

That story, however, is total bunk according to film scholars.

First, this movie was displayed on a screen that was only about seven feet tall,

So people were only seeing a tiny li’l mini-train pull into the station.

Second, legends about this film might have been based on newspaper accounts of the day—

Some of which described spectacle of seeing a moving image much in the way we might call an IMAX movie thrilling—not that we really think it’s *real*.

Other newspaper articles might have played up the rumor that people were frightened to cast aspersions

On the mainly working class people who were loving this new egalitarian form of entertainment.

**R.W. Paul**

In fact, there’s a 1901 film by R.W. Paul from the U.K. that uses this legend as a joke!

**[Play film.]**

**The Sprinkler Sprinkled**

And here’s our final clip of the day: The Sprinkler Sprinkled.

This is the earliest “comedy” film that we’re aware of.

**[Play film.]**

Knee-slapper, right? You can pause me to go change your pants, I bet you’re laughing so hard.

**What do they have in common?**

So, while these films demonstrate the nimbleness of the cinematograph over the kinetograph,

They have some things in common:

[**Animation]**

**The camera is stationary**

**One movie = one shot**

**They’re short! No more than about a minute long**

**They’re all about spectacles or reality – and we’ll talk more about that next week.**

**And by 1902, filmmaking this way is old news. People want *stories*.**

**Who invented films?**

And we can hopefully answer this question in a more nuanced way

**[Animation]**

Lots of people in lots of places invented the movies, building on each other’s innovations, on optical toys, and on ancient observations about how human vision works.

**Technological determinism**

One last concept.

We’ve looked at history today through the lens of technology, and this approach is sometimes called

“technological determinism”

Or an approach that identifies technology as the central causal element in processes of social change.

So, that’s Rebecca Solnit’s idea that the railroad and photography changed how people lived in the 1800s.

**Eugen Sandow**

That’s all for today, and that’s all for this first week!

Congratulations for making it through,

And Eugen and I wish you a happy (and muscular) weekend.