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Which Came First: the Art or the Technology?

While animation is often not discussed in traditional art history settings, animation has its own rich history dating back to the seventeenth century. Perhaps because the earliest of animations are often unrecognizable from today's well-known and beloved animations, one thing for sure is the cyclical nature of the progression of animation. This art form is unique involving not only artists, but also storytellers, and inventors, and ambitious people trying to create the impossible in a realistic world. The success of animation relies heavily on two factors, the art form, encompassing the drawing of characters and the story they tell, and the technology that enables the characters to exist in these forms and tell their stories. When looking back at the progression of animation you see that as each technology is created, utilized, and perfected, the need for a new technology to produce even better films is demanded. This cycle of art needing better technology and the technology needing better art is the manner in which the art of animation has developed to where it is today. As modern day animator John Lassater said "The art challenges the technology and the technology inspires the art" stands for all past, present and future animations. In analyzing animation during the 20th century, the four biggest technologies to have an impact on the increased quality and progression are the rotoscoping, multiplane camera, Technicolor processes, and sound technology.

In 1915, Charles, Max, Joe, Lou and Dave Fleischer opened the Fleischer Brother's Studio becoming a dominant studio during the Silent Era and throughout their

career well known for their animated works of Koko the Clown and Fitz the Dog, Popeye the Sailor, Betty Boop, and Superman. Of the five brothers, Max and Dave were the two most involved and brought the most success to their studio (1). In 1915, during the studios early beginnings, Max and Dave began developing a technique called rotoscoping. This technique used a film projector to project motion picture film through an opening in an easel that was covered by a glass pane and served as the surface for retracing the images, which were advanced one frame at a time (2). Max Fleischer is credited for having created the technique because he obtained a patent in 1917 (1). Max first put this new technology to use in the making of *Out of the Inkwell* animated series produced from 1918 to 1927. To make this series, Max rotoscoped his brother Dave, who, at the time, was working at Coney Island as a clown, and thus was born Koko the Clown.

Upon watching Koko the Clown's on screen performance, you can immediately tell he differentiates himself from previous animated characters such as Gertie the Dinosaur because his movements are so fluid and lifelike. Having greater precise movements allows for characters to have better develop personalities. Because the original Koko the Clown episodes were in black and white and didn't have sound, animators relied heavily on body and facial motions to tell a story. Animators originally believed rotoscoping would help speed along the process of creating animations, however the process proved to take even more time than intended. There are two rotoscoping methods, either using a rear projection or a front surface projection, however both methods result in line deviations due to the separation of the image and the glass plane.

As a result of the line deviations, wiggles are created in the shape outlines, and need to be reworked over an animation disc causing many of the unforeseen time delays (3).

One of my favorite rotoscoped films developed by the Fleischer Brothers was *Betty Boop in Snow White* because it featured Cab Calloway, a famous jazz performer, who was rotoscoped to create Koko the Clown in this particular animation. Cab Calloway is a phenomenal dancer, and watching his dance moves performed by Koko is very special because it combines the realistic and stylistic dance moves combined with literal character transformations from a clown to a ghost to a chain necklace back to a clown to create a very diverse performance. Although Walt Disney Studios won't admit it, it is believed due to strong evidence that *Snow White and the Seven Dwarfs* (1937) used rotoscoping. Perhaps the studio won't admit to using the rotoscope because many animators believed it to be "cheating" while I on the other hand found it to be an available tool accessible to those who wanted help with the basic structure of motion. Even if you traced a figure, it was still necessary to make changes to accessories, such as clothes, to create a uniquely distinct character distinguishable and recognizable from other characters.

Even though Walt Disney Studios makes no claim in using the rotoscope techniques, lead animator Ub Iwerks from Walt Disney Studios is credited for having created the multiplane plane camera in 1933, and interestingly enough the rig was made from old Chevrolet car pieces. The multiplane plane camera is used to create depth in scenes and help facilitate the movement in and out of scenes by having different elements of a scene on different planes. In competition, the Fleischer Studios created a similar device called the Stereoptical Camera/ Setback in 1934 that used 3D miniature sets built

to the scale of the artwork allowing for different objects to pass in front or behind the scene using a horizontal camera. However, the most successful version of the multiplane camera was created by William Garity from Walt Disney Studios used for the making of *Snow White and the Seven Dwarfs*. This multiplane camera operated with a vertical moveable camera that captured up to seven layers of artwork painted in oils on glass (4). An example of this in *Snow White and the Seven Dwarfs* is the opening scene in which the scene is probably divided into the greenery being on the top plan closest to the camera, followed by the castle and the water, and then the green land and cloudy sky at the bottom furthest from the camera (5).

This illusion of moving into and out of scenes is very effective in not only that is bringing more literal depth to the artwork and animation but is also being used to tell stories by better moving audiences into and out of certain scenes. Referring back to the example provided, when “zooming in” past the trees to the castle and then the window of the castle, this helps the audience feel like they are leaving behind their own world and entering a new sort of place to discover exactly who this Snow White character is and what she has to do with seven dwarfs. This is huge for storytelling because the multiplane camera is helping to create immersion and because audiences know these worlds are completely fictional and from the imaginations of artists, the immersion into these imaginative worlds makes it that much more believable of being real because you as the audience member are now part of the story, not just an outsider looking in. Overall, the multiplane camera was useful in creating 3D effects and also helped to achieve special effects such as moving water and flickering light (4).

In addition to having the technology to create moving water and flickering light, adding color to the film would make these elements even more believable. The first color process known as the Kinemacolor process was invented in England and used commercially in 1908. Less than a decade later in 1916, a new process known as Technicolor gained popularity in Hollywood along with Cinecolor (even though it wasn't introduced until 1932) based off of the Prizma Color system and the Multicolor system. While there is some debate over the first color-animated film, credit is giving to Bray Productions cartoon of *The Debut of Thomas Cat* (1919) which Brewster Color a two-emulsion color process (6). The most popular methods of color were Technicolor's two-color and three-strip system. The two-color system went through iterations of processes, the first process using a prism beam splitter behind a camera lens to expose two consecutive frames to a strip of black and white negative film one behind a red filter and the other a green. Interestingly enough, to show this film, you needed a special projector with an aperture for the red filter and another aperture for the green filter, two lenses, and an adjustable prism to line up the two images (7).

When the three-strip process was fully realized and developed in 1929, the process was far superior to any other competitors because it used a subtractive synthesis instead of an additive synthesis. In addition, the three-strip process didn't need any special projection equipment, so that was a huge money saving bonus. Herbert Kalmus, one of the engineers of Technicolor, approached Walt Disney to create a *Silly Symphonies* cartoon, *Flowers and Trees* (1932) using the new three-strip process, which he did. As a result of this, Disney signed an exclusive contract allowing him to use the process until September of 1935 preventing studios like the Fleisher Studios and the

independent Ub Iwerks Studio from using this technology. They were stuck among other animators to continue using the inferior two-color Technicolor system or the Cinecolor process (7). While this isn't the first time that rights and licensing proved to be a setback, I think this is the first time that other studios were so blatantly denied access to new technology. The Walt Disney Studios was the only animation studio to have rights to the best color process for 3 years allowing him to excel and increase the quality of products so rapidly only makes sense as to why they were able to easily pull ahead of the competition. Even Disney having lost his best animator couldn't slow him down, instead he was learning to get better without Ub and really focused on how this technology could and was revolutionizing animation.

Continuing with Walt Disney Studios and his *Silly Symphonies*, this cartoon series was very unique because although it wasn't the first animated series to use the newly available sound technology, the series utilized sound in a very unique way. Most of the early animations that used sound didn't know how to properly utilize this technology because it just seemed like sound was an afterthought thrown in at the end of the process often causing on screen action and noise to be un-synced. However, the Silly Symphonies used music to inspire the animations, to tell a more effective story using feelings and ideas evoked by the music rather than just strict dialogue or the music as background noise with no real purpose. Disney and his team learned on the power of music from early on and that is why his animated movies still today have such well-loved soundtracks.

In conclusion, while many people had a role to play in the advancements of technology, no one other than Walt himself fully realized the potential and possibilities

technology had to offer the art. When many studios were looking for ways to produce larger quantities of animated films more cheaply, Disney was looking to spend more money on creating better technology to create better art. It is my hope that as we continue to develop more films we never lose the determination to create better technologies to ultimately create the most immersive art and tell the best of stories.

Works Cited

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