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Rotoscoping Body: Secret Dancers, Animated Realism and Temporal Critique

Abstract

In the Fleischer original rotoscoping process, the animator was drawing on a transparent easel, onto which the movie projector was throwing an image of a live-action film frame. This technology improved the smoothness of character movement, most notably the Cab Calloway dance routines in Betty Boop cartoons and Marge Champion dance sequences in the 1937 animated feature *Snow White and the Seven Dwarfs*. The rotoscoping technique not only opens up a window for us to reimagine the Disney-Fleischer relationship in the 1930s, but also creates possibilities of "reanimating" film theory, especially crucial issues regarding realism, motion, and temporality. The purpose of rotoscoping is not to make the cartoon character *be* realistic, but to make it *feel* realistic. It is the stark contrast between the cartoony, unrealistic character design and the life-like, realistic body movement that successfully arouses audiences' amazement. Examining Eisenstein's notion of "plasmaticness" and Rey Chow's notion of "automatization," I argue that the two notions run in opposite directions, but both are simultaneously and paradoxically embedded in the rotoscoping body in animation. Marge Champion's dance footage for Disney's 1937 *Snow White* was reused in the 1973 animated feature *Robin Hood*. In terms of temporality, I read the recycled rotoscoping sequence as a critique of homogeneous time in Bergson's sense. When we are watching Maid Marian's dance sequence in *Robin Hood*, Snow White's dance sequence seems to be in front of us at the same time. It gives us an uncanny sense of multiple cohabiting worlds and foregrounds a clear sense of temporal discrepancy that cannot entirely dissolve into homogeneous time.

Introduction

On December 21, 1937, Carthay Circle Theatre in Los Angeles witnessed a historical moment of American animation: the glittering premiere of Disney's animated feature *Snow White and the Seven Dwarfs*. A seventeen-year old school girl, Marge Champion (at the time she was Marjorie Belcher), was seated in the balcony and told not to talk about her role in the film's production: the secret dancer for Snow White in the rotoscoping process.

This article starts with the forgotten yet fascinating history of rotoscoping, segueing into studio discourse and technological competition. My central concern, however, lies in where history and theory intertwine: how can the rotoscoping technique, or marginalized history of animation in general, open up possibilities of "reanimating" film theory, especially crucial issues regarding realism, motion, and temporality?

Secret Dancers, Forgotten Technology

Despite being brilliantly utilized in Disney's animated feature *Snow White and the Seven Dwarfs*, rotoscoping was first of all a Fleischer-developed process. In 1914, in Brooklyn, New York, Max Fleischer made a new machine that he called a "rotoscope." In the original rotoscoping process, the animator was drawing on a transparent easel, onto which the movie projector was throwing an image of a live-action film frame. A system of pulleys allowed the animator to advance the live-action film and "copy" the live-action movement, frame by frame. Max Fleischer patented the rotoscope method in 1917.

Before this machine was invented, animators would take great effort to accumulate references for their images. These references ranged from photographs to acting out the movements themselves in front of a mirror. The rotoscoping

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technique provided animators with a road map through the nuances of human motion and significantly improved the smoothness of character movement in cartoons.

This technique debuted in the *Out of the Inkwell* animated series. The model for Koko the Clown in the *Out of the Inkwell* series was nobody else but Max Fleischer's brother, Dave Fleischer, who went on to become director and producer of the studio's output. As *The New York Times* commented in 1920, Koko the Clown, had:

> a number of distinguishing characteristics. His motions, for one thing, are smooth and graceful… He does not jerk himself from one position to another, nor does he move an arm or leg while the remainder of his body remains as unnaturally still as if it were fixed in ink lines on paper.[1]

Rotoscoping was intensively and effectively used in a number of later Fleischer cartoons, most notably the Cab Calloway dance routines in three Betty Boop cartoons from the early 1930s, *Gulliver's Travels* (1939) and Superman cartoons of the early 1940s. As Tim Stack has summarized, the Fleischer studio made three Betty Boop cartoons, *Minnie the Moocher* (1932), *The Old Man of the Mountain* (1933), and *Betty Boop in Snow-White* (1933), tracing over live-action footage of legendary bandleader Cab Calloway. In this short and not-too-sweet *Snow-White* (1933), when Betty-as-Snow is trapped in a coffin-shaped block of ice and carried through an underground cave, Calloway-as-Koko "breaks into the bandleader's signature insinuating shuffle to the tune of *Saint James Infirmary*, then metamorphoses into a long-leg ghost with all the right moves."[2]

Not only did Cab Calloway earn credits in the three cartoons, both *Minnie the Moocher* (1932) and *The Old Man of the Mountain* (1933) open with a live-action clip of Calloway and his orchestra before plunging into the cartoon world of Betty Boop. Calloway was very smart to give his concerts in major cities one or two weeks after the screenings of those Betty Boop cartoons. With the help of the Fleischer missy, his concert tickets sold very well.

In stark contrast to Cab Calloway is Marge Champion, who was forced to stay tight-lipped about her role in Disney's production. When she was only 14, she went over to audition and was shown all kinds of storyboards, in which the Disney's Snow White looked just like Betty Boop, with round eyes, long eyelashes and a very tiny waist. She was asked to come again and get measured for a costume. For about two years, she acted as the secret dancer for Snow White at the Disney Company for two or three days each month and was paid ten dollars a day. For a brief but miserable time, she had to wear a football helmet so her head-to-body ratio would approximate her animated doppelganger.

Reimaging the Disney-Fleischer Relationship

The different attitudes of the Disney Company and the Fleischer Studio towards their secret dancers, in a certain sense, reveal that Disney exercised a higher degree of control over the studio production. Not only secret dancers, but also animators enjoyed a higher degree of creative freedom at the Fleischer Studio. Preoccupied with developing technology, Max Fleischer had little direct communication with day-to-day production. Dave Fleischer was credited as "director" of all cartoons released by the Fleischer studio from 1921 to 1942, including the *Betty Boop* series. Nonetheless, in most cases it was after the animators had already finished the design of a certain character or when the checkers were flicking a new scene that Dave Fleischer would give some suggestion. Also, the Fleischer brothers did not encourage their animators to specialize in one particular character. As a result, animators at the Fleischer studio might change the appearance of animated characters on a whim. Unlike the Disney Company, which was physically divided into separate rooms for separate job categories, the early Fleischer Studio had only one large space so that all workers worked together. There was even no story department in the Fleischer Studio until 1935.[3]

In tandem with the lower degree of control at the Fleischer Studio was a "wilder" spirit of early Fleischer cartoons. As Mark Langer has observed, while Disney style prefers linear, coherent film narratives, Fleischer style privileges a gap-oriented structure. While Disney cartoons are invested with normative ideological meanings endorsing middle-class values, Fleischer cartoons often revel in risqué or forbidden behaviors.[4] *Old Man of the Mountain*

(1933) in which Calloway gives smooth-stepping life to the lecherous troll who pulls off Betty's dress serves as a salient example here. Langer further explains that the multiethnic, hybrid New York culture was the soil on which polyphonic, heterogeneous Fleischer cartoons could grow.[5] Even Adorno and Horkheimer reveal a strong interest in sexualized and sometimes immoral Betty Boop and mention her as an example in their analysis of the masses' acquiescence to a morality imposed on them:

> As naturally as the ruled always took the morality imposed upon them more seriously than did the rulers themselves, the deceived masses are today captivated by the myth of success even more than the successful are. Immovably, they insist on the very ideology which enslaves them. The misplaced love of the common people for the wrong which is done them is a greater force than the cunning of the authorities. It is stronger even than the rigorism of the Hayes Office, just as in certain great times in history it has inflamed greater forces that were turned against it, namely the terror of the tribunals. It calls for Mickey Rooney in preference to the tragic Garbo, for Donald Duck instead of Betty Boop.[6]

In the post-1935 period, the *Betty Boop* cartoon series gradually lost its "wild" spirit. Jeff Lenburg describes the revisions of the screen image of Betty in a sentimental tone: "Gone was the garter, the short skirt, the *décolletage* that make her so unique. In its place was a more fully clothed Betty, a character stripped of her charm."[7] Echoing Adorno and Horkheimer, Esther Leslie notes that the sanitizing process of Betty Boop is a futile surrender to the masses' standardized taste.[8] As one of the most successful players in the mass cultural industry, Disney succeeded in fathering the mass audiences to insist on its normative ideology. It was those audiences that complained about the risqué behaviors in early Betty Boop cartoons and resulted in the process of refinement. The residual creative freedom of Fleischer cartoons was squeezed out. Betty Boop bowed out as a headliner in 1939. In this sense, the final victory of Disney over Fleischer studio, or Donald Duck over Betty Boop, is the masses' choice for more standardized products, or a form of submission. This choice only reconfirms their incurable sameness.

The rotoscoping technique itself also opens up a window for us to reimagine the fierce Disney-Fleischer competition at that time and to rethink how this technology-based competition registered the internal dynamic of the film industry at large. A juxtaposition of the titles of animated films from the two studios, such as *Betty Boop in Snow-White* (Fleischer, 1933) and *Snow White and the Seven Dwarfs* (Disney, 1937), *Gulliver Mickey* (Disney, 1934) and *Gulliver's Travels* (Fleischer, 1939), indicates that the Fleischer Studio and Walt Disney Productions were keenly aware of each other's actions. As Mark Langer argues, a chronology of technological innovations at the Fleischer Studio and Disney Productions demonstrates a competitive pattern of product differentiation. Max Fleischer was conscious of Disney having utilized many Fleischer-developed processes, such as the rotoscope. Max Fleischer's invention of the rotograph, a rear projection system to achieve superior image quality and ease of construction of scenes combining live-action and animated characters, is also read as a further advance in product differentiation. Each of the technical innovations was met by a response from the institution's competitor, resulting in a never-ending cycle of expensive product differentiation and a consequent erosion of profit. Following the commercial success of *Snow White and the Seven Dwarfs*, the Fleischer studio drove itself into insolvency by combining all of its technologies in the feature-length *Gulliver's Travels* (1939). The Disney-Fleischer relationship, as Langer views it, is highly competitive, noncooperative, and irrational.[9]

The Ambivalent Relationship Between Animation and Photography

History and theory are by no means separated enterprises. Film history affords us the opportunity of rethinking film theory. It is especially challenging as well as productive when the marginalized parts of histories enter theoretical discourse. In film studies,

animation has been largely marginalized. Even within animation studies, animation technology has received very little attention. If, as Tom Gunning has described, the marginalization of animation is "one of the great scandals of film theory,"[10] the forgotten history of rotoscoping that I have delineated will serve as the starting point for my theoretical investigation regarding realism, motion, and temporality. Since the notion of "realism" was associated with – perhaps is still associated with – a narrow obsession with photography in classical film theory, my tentative exploration of the concept of "realism" in animation will start with a reconceptualization of the relationship between animation and photography.

In *The Language of New Media*, Manovich promotes animation in opposition to film's umbilical connection with photography.[11] Indeed, viewing animation as the anti-index plays a vital role in shifting theoretical focus from a narrow obsession with photography to a new exploration of animation as an art of imagination.

In a recent article in *Animating Film Theory*, Tom Gunning elaborately argues that placing animation in opposition to photography does not really offer us the best understanding of its nature. Instead, he points out what he calls "the secret symmetry between animation and photography."[12] In the first place, animating drawings in classical animation involves the process of photographing them onto a filmstrip. In the second place, even animation that employs drawing directly on the filmstrip, so-called cameraless animation, commonly involves the making of a projection print through photographic processes. Therefore, Gunning concludes that most animation actually requires photography as a means of mechanical reproduction. Only by recuperating the secret symmetry between animation and photography can we achieve a better understanding of how animation works.

Something should be added to Gunning's analysis here. The ambivalent relationship between animation and photography can be further complicated by a consideration of stop-motion animation and the rotoscoping process. Stop motion is also known as stop frame. As its name reveals, the object is moved in small increments between individually photographed frames, creating the illusion of movement when the series of frames is played as a continuous sequence. Depending on frame-by-frame photography, the mode of stop-motion animation making signals a precarious position between animation and so-called live-action cinema and deserves an in-depth discussion that goes beyond the concerns of my present study of rotoscoping. I will detail here, however, how the rotoscoping process adds another layer to the secret symmetry between animation and photography, and how this technique suggests a move toward understanding the complexity and the dialectical nature of Bazin's notion of realism.

We can find different conceptions of "realism" in Bazin's writings, such as ontological realism, epistemic realism, transparent realism and perceptual realism. In "Theater and Cinema," Bazin ambivalently links different conceptions of 'realism': "(The photograph is) the taking of a veritable luminous impression in light - to a mold. As such it carries with it more than a mere resemblance, namely a kind of identity."[13] A camera is used (at least) twice in the rotoscoping process. Firstly, it is used to film the live-action footage. Secondly, it is used to film the drawings that the animator has completed onto a filmstrip. The animated body on the silver screen achieved by rotoscoping, of course, does not fit into Bazin's frequently quoted description of the "luminous mold" that the photograph supposedly depends on. The creative work of the animator also denies Bazin's assumption that between the originating object and its reproduction there intervenes only the instrumentality of a nonliving agent. However, what cannot be denied here is, in Bazin's own words, "a kind of identity,"[14] carried from the secret dancer to the animated body.

For instance, Tim Stack describes the Cab Calloway dance routines in Betty Boop cartoons:

> The Fleischer brothers made three Betty Boop films featuring characters rotoscoped over footage of legendary bandleader Cab Calloway, whose slinky slides, rubber-legged splits, suggestive hip swivel and smooth, moonwalking shuffle (a full half century before Michael Jackson made it his trademark) are instantly recognizable.[15]

Even when Calloway is in the shape of Koko

the Clown, a long-legged ghost, or anything else, his identity is unmistakable. Also, the identity of Marge Champion is recognizable in every movement of Snow White. The animated body in a rotoscoping sequence still has an "irrational power to bear away our faith."[16] It is an image that owns credibility. It is a kind of epistemic realism that depends on a more complex (and less logical) process of spectator involvement. Here, the discussion of realism cannot be allowed to ossify into a dogmatic assertion about the indexical nature of photography, after the fashion of a fingerprint. If the animated body can still be thought of as in some way "indexical," it calls for a broader understanding that considers the indexical as a trace or an impression.

"Realism" in the World of Imagination

In addition to a Bazinian reading, the notion of "realism" can also be discussed in the context of the American animation industry, roughly from the 1920s to the early 1940s. At a time when the fascination with technology was spreading to every corner of the world, every new invention at the Disney Company or the Fleischer Studio was first of all an attraction in itself. For instance, the improved smoothness of movement obtained by the rotoscoping process was a central part of the marketing publicity surrounding the Fleischer studio's *Out of the Inkwell* cartoons. As Richard Schickel has observed, a chronology of technological innovations in the animation industry from the 1920s to the early 1940s, including rotoscoping, sound, technicolor, the three-dimensional stereoptical process and the multiplane camera, was an unbroken march towards realism. To slightly vary Bazin's famous statement, it was a process in which animation attained its fullness in the art of the real. In this vein, Schickel sees the multiplane camera as "a symbolic act of completion for Disney. With it, he broke the last major barrier between his art and realism of the photographic kind."[17]

In an interview with Mark Langer, Richard Fleischer recalled that his father Max Fleischer was actually opposed to the aesthetic tendency towards realism in the animation industry during the time in which he developed the stereoptical process:

> During the span from 1914 to 1936, I made efforts to retain the "cartoony" effect…Let us assume we desire to create the last word in a true to life portrait. We examine the subject very carefully and religiously follow every shape, form and expression. We faithfully reproduce every light, shade and highlight. Upon completion of this grand effort, we compare our result with photograph… What have we now? Nothing at all. We have simply gone the long way around to create something that the camera can produce in seconds. In my opinion, the industry must pull back. Pull away from tendencies toward realism. It must stay in its own back yard of "The Cartoonist's Cartoon." The cartoon must be a portrayal of the expression of the true cartoonist, in simple, unhampered cartoon style. The true cartoon is a great art in its own right.[18]

If the "cartoony" effect, as Max Fleischer called it, is the ontology of animation, is rotoscoping nothing more than an evanescent technological attraction that actually betrays animation's ontology? My answer is no. The purpose of rotoscoping is not to make the cartoon character *be* realistic, but to make it *feel* realistic. To be more precise, it is the stark contrast between the cartoony, unrealistic character design and the life-like, realistic body movement that successfully arouses audiences' amazement. Neither live-action film nor comic strips can achieve this effect. In this sense, the animated body becomes a symbol of the oscillation between the realistic and unrealistic, between the mundane and the fantastic.

To move a step further, we need to question why rotoscoping characters feel more real than those without using this technique and why animations feel more real than comic strips. I find an answer to the two questions in Metz's writings: "It is movement… that produces the strong impression of reality."[19] Once cinematic motion is injected into the unreality of the image, "the world of imagination"[20] becomes more real than it had ever been. The moment in *Perpetual Motion* (Bray, 1920) when Max Fleischer is breathing life into the inkblot clown can be seen as an interesting footnote

for Metz's description of cinematic motion, and vice versa. The notion of "life" that Deleuze describes in *Pure Immanence: Essays on A Life* also signals an aesthetic of the in-between that is akin to animation:

> A life is everywhere, in all the moments that a given living subject goes through and that are measured by given lived objects: an immanent life carrying with it the events or singularities that are merely actualized in subjects and objects. This indefinite life does not itself have moments, close as they may be one to another, but only between-times, between moments; it doesn't just come about or come after but offers the immensity of an empty time where one sees the event yet to come and already happened, in the absolute of an immediate consciousness.[21]

"The world of imagination" in Metz's description is not only an alternative name for animation, but also guides me to Dudley Andrew's phenomenological questioning of the concept of cinematic worlds: "What exists beyond the [film] text and what kind of description can be adequate to it? Here we encounter the exciting and dangerous term 'world.' A film elaborates to a world which it is the critic's job to flesh out or respond to. But what is the cinematic world?"[22] It seems that Deleuze has provided us with a thought-provoking – albeit not definitional – answer to this question: "A work of art always entails the creation of new spaces and times (it's not a question of recounting a story in a well-determined space and time; rather, it is the rhythms, the lighting, and the space-times themselves that must become the true characters)…"[23] I want to emphasize that the animation world not only entails the creation of new spaces and times, but also requires the presence of motion. The presence of motion distinguishes animation from comic strips and indicates the existence of energy, which opens the space into a new dimension of cosmic dynamism. As Henri Lefebvre points out, "everywhere there is interaction between a place, a time and an expenditure of energy, there is rhythm."[24] The animation world is therefore a world crisscrossed with multiple temporal rhythms, a world full of vivacity, spirit and creative imagination. "The world of imagination," nonetheless, does not mean that it is a world with little or no relation to the phenomenal world surrounding us. I insist that, in the world of animation, the narratives, the languages, the life-like body movement and even the presence of motion are all referential to the natural world. The animation world is not a world of pure imagination. It is the art of bending nature to imagination.

Motion and Body

Before proceeding to my theoretical discussion on motion and body, I'd like to continue the story of Marge Champion. Marge Champion's dance footage for Disney's 1937 *Snow White* was reused in the 1973 animated feature *Robin Hood*. Snow White becomes Maid Marian, an anthropomorphic fox with the exact same moves.[25] Recycling live-action footage in different animated films' rotoscoping processes was a common method in Disney's production out of economic necessity.[26] The extreme form of recycling animation, however, can be found in the Fleischer studio's *Betty Boop's Rise to Fame* (1934). This animated short starts with a live-action sequence, in which a reporter (played by Dave Fleischer) interviews Max Fleischer asking about the latest animated star Betty Boop. Max obligingly draws Betty "out of the inkwell"[27] and asks her to give performances in a couple of scenes that have appeared in her former cartoons, such as *Stopping the Show* (1932) and *Old Man of the Mountain* (1933). Here, the previously mentioned scene in *Old Man of the Mountain* (1933) where Calloway gives the smooth stepping to the lecherous troll is brilliantly reused.

The recycling of footage leads me to reconsider the relation of motion and body. In the first place, two different animated bodies with exactly the same movements foreground the relationship between body and motion, as Peirce puts it, "we ought to say that 'a body is in motion, and not that motion is in a body.'"[28] In the second place, the motion that can be projected into different animated bodies further indicates animation's ambition of creating motion and projecting it into the spectator's body. In his writings on Disney, Eisenstein reveals the potential of the animated line to invoke precisely this aspect

of motion, which he coins "plasmaticness" and defines as "a rejection of once-and-forever allotted form, freedom from ossification, the ability to dynamically assume any form."[29] Indeed, seeing the untrammeled, restless animated line on the screen, we feel as if it is dancing in our guts or throughout our bodies. Yet, Eisenstein does not offer us the reason why the animated line has the potential to activate the spectator's embodied engagement. I find a way to understand why through Bergson: "In order to advance with the moving reality, you must replace yourself within it."[30] That is to say, participating actively and physically in the motion is the only way for the spectator to perceive motion on the silver screen.

Eisenstein's praise of "plasmaticness" points to the excessive energy and metamorphic potential of the animated body, which might best be exemplified by a rotoscoping dance sequence. This powerful body, as Eisenstein sees it, "triumph[s] over the fetters of form."[31] Watching such a dance sequence, audiences regain a sensuous thought free of the shackles of logic and rationality.

In contrast to Eisenstein optimistic reading is Rey Chow's pessimistic analysis of the animated-technologized body. According to Chow, being animated is to have one's body controlled by an invisible other. In other words, it is to become an automaton, subjected to a manipulation "whose origins are beyond one's individual grasp."[32] While Chow understands automatization as a condition of the postmodern body in general, she also points out that certain bodies are technologized in more pronounced ways than others. The rotoscoping body, I would say, is the body that is technologized or automatized in the most pronounced way. The art of rotoscoping is exactly an art of invisible control. It points to the underlying fixed and rigid nature of the animated body. The two perspectives from Eisenstein and Chow, the antithetical notions of "plasmaticness" and "automatization" run in opposite directions, but both are simultaneously and paradoxically embedded in the rotoscoping body in animation.

Rotoscoping Time

Bergson's understanding of motion is closely related to his temporal critique. In what follows, I read the rotoscoping process of animation as a process of rotoscoping time.

As part of the rotoscope, the movie projector is throwing an image of a live-action film frame onto a transparent easel. The temporality of film is transformed into the spatiality of live-action film frames, later into the spatiality of drawings via the hands of the animator, and lastly into the spatiality of a filmstrip via the presence of the camera. During subsequent screenings, the spatiality is transformed into the temporality of animation. The temporal metamorphosis of the whole process can be visually represented as:

Immobilizing		**Animating**
Time Flowing	**--->-----Time Frozen-----**>	**---Time Flowing**

Fig. 1 The temporal metamorphosis of rotoscoping

To describe this process in terms of movement, we can say, movement is vaporized in the first half of the process, and is reborn in the second half. To slightly vary Bergson, it is true that if we only look at the live-action film frames, the drawings, or the animation frames with our own eyes we will never see them animated: "with immobility set beside immobility, even endlessly, we could never make movement."[33] The movement here, to be explicit, is reborn from a mechanical apparatus – the cinematograph during a screening. Only when the film of the cinematograph unrolls, the movement is recovered. This is what I regard as one important but elusive aspect of Bergson's argument about cinematograph: at the core of the apparatus is an artificial mechanical motion achieved through technology.

For Bergson, the cinematograph is not understood as a figure for flowing time. Instead, it serves as Bergson's most consistent figure for spatialized time. In *Time and Free Will*, Bergson introduces the distinction between heterogeneous time, or pure duration, and homogeneous time, or time-as-space. "Heterogeneous time," or "pure duration," refers to what Bergson has depicted in *Matter and Memory*: a radical plurality of durations, a multiplicity of coexistent but non-coinciding times.[34] Although "heterogeneous time" or "pure duration" tells us the truth about time, it is not the modern concept of time. When we speak of time, we generally "think of a homogeneous medium in

which our conscious states are ranged alongside one another as in space."[35] That is to say, time is projected into space by us, taking on the form of a line or a chain, the parts of which touch without penetrating one another. In this false-but-familiar understanding of time, "homogeneous time," or "time-as-space," past and present are *before* and *after*. The concept – indeed the illusion – of the homogeneous, measurable time dominates our modern society because it satisfies our utilitarian purposes. Only by regarding time as a measurable quantity, can we be precise, take control over periods of work and leisure, and sell labor time in the form of commodity. The emergence of the mechanical clock signals the inception of modern homogenous time, gradually covering the real face of ancient heterogeneous time: when we "follow with [our] eyes on the dial of a clock the movement of the hand," we merely "count simultaneities" and thus we learn to accept the illusion of homogeneous clock time.[36] Cinema, just like a clock, illustrates the homogeneous time by converting heterogeneous temporalities into a series of equidistant intervals – 24 frames in every second. What's worse, the contrivance of the cinematograph lies in the fact that when we watch movies, we accept the illusory motion of "24 frames per second" and combine it with our personal attitudes. In this mode, "we hardly do anything else than set going a kind of cinematograph inside us."[37]

In terms of converting heterogeneous temporalities into a series of equidistant intervals, or to put it more briefly, spatializing time, the rotoscope is no doubt a better instantiation than the cinematograph. Cinema's clockwork is hidden in its mechanical movement; the rotoscope makes visible the spatialized, homogenous temporalities by throwing images of live-actions film frames, one by one, onto a transparent easel. The contrivance of the cinematograph is to control the spectator secretly by planting the illusion of "24 frames per second" into the spectator's personal perception; the rotoscoping body controlled by an invisible other, as previously discussed, reveals its fixed and rigid nature in the most obvious way and might be analogous to the spectator's body. In short, rotoscoping is a figure for homogeneous time, or time-as-space. However, this is only one aspect of rotoscoping.

The other aspect is that the recycled rotoscoping sequence paradoxically undertakes a critique of homogeneous time. When we are watching Maid Marian's dance sequence in *Robin Hood* (1973), Snow White's dance sequence seems to be in front of us at the same time. The image here is not a singular image, but an image pregnant with the past. It is the recycling of live-action footage in the rotoscoping process that enables us to recognize the failure of the homogeneous time's logic. We suddenly realize that the past, or the plurality of pasts, is not dead but instead coexists alongside the present. It gives us an uncanny sense of multiple cohabiting worlds and foregrounds a clear sense of temporal discrepancy that cannot entirely dissolve into homogeneous time. It is an "undissolved" zone where we strongly feel what Bergson calls "the bite of time."[38]

If we say that, because of our memory of *Snow White* (1937), we see the real face of heterogeneous time in the dance sequence in *Robin Hood* (1973), here we reencounter the role of memory and the spectator's gaze in Bergson's discourse. For Bergson, spectatorship is never changeless or still. In *Creative Evolution*, he provides us with an extreme example: an immobile spectator looking at an immobile object. Even in this case, argues Bergson, changes are still unceasing, because at least: "My memory is there, which conveys something of the past into the present. My mental state, as it advances on the road of time, is continually swelling with the duration which it accumulates: it goes on increasing – rolling upon itself, as a snowball on the snow."[39]

In the sense that we perceive changes because of our own accumulating memory, the coexistence of levels of duration is not exclusive to the recycled rotoscoping sequence. The contribution of the recycled rotoscoping sequence is only to "foreground" it. Other cinematic devices might also foreground the survival of heterogeneous time, the trace of untranslatable times – this is what Bliss Lim terms "immiscible temporality."[40] Writing on *Rouge* (dir. Stanley Kwan, 1987), Lim indicates two such devices. The first device is a reinvented point-of-view shot. Fleur, a ghostly courtesan who committed suicide in 1934, comes back to Hong Kong to seek her lover in 1987 after 53 years of waiting and finds herself in a city that she can no longer recognize. We see a shot of Fleur looking at the cityscape. In her point-of-view shot is a dreamlike place she

remembers from 1930s Hong Kong. This image fades to dark, followed by a reaction shot of Fleur's melancholy face. Finally, we are given a shot of the 1980s ugly building in front of Fleur. The second device is a double exposure. When Fleur walks past a 1980s shop window, in a double exposure, we see, reflected in it, the shadowy performance of an old Cantonese opera from the 1930s.[41] Through all these devices, a recycled rotoscoping sequence, a reinvented point-of-view shot of a ghostly figure and a double exposure, we suddenly come to realize that the past coexists with present. Each of these devices foregrounds a coexistence of sheets of duration or a moment crosshatched with various temporal rhythms.

Time is perhaps the most mysterious and ambiguous existence that we can ever encounter. We find languages paralyzed and find ourselves helpless whenever we try to tell what time is. To approach time, images are more powerful than languages. "What is specific to the images," writes Deleuze, "is to make perceptible, to make visible, relationship of time…"[42] The approach of "mak[ing] time visible" in Deleuze's understanding is what I call "rotoscoping time." I'm especially interested in how certain cinematic images, such as a recycled rotoscoping sequence, can be understood as a way of rotoscoping time: although we cannot tell clearly what time is, we can, at a certain moment, through such a visualized form, "draw" the heterogeneous face of time. By rotoscoping time, we're given a drawing of the face of time, rather than the real face of time itself, as time will never turn its real face to us. This drawing can also be called a better understanding of time.

My tracing of the early history of rotoscoping technique in the article, or any historical writing in general, is in a certain sense also a rotoscoping process. Nobody can reconstruct history as it once was; what we can do is to rotoscope history with our own hands, trying not to lose its pulse. Bringing the past, or the plurality of pasts, back to life is not only the magical power of recycling animation, but also the illusion that history endlessly fosters. At the thorny points where history and theory intertwine, my study testifies to the possibility of engaging animation in theoretical discussions whose pertinence extends far beyond the terrain of cartoons and the feasibility of visual solutions for a philosophy of time.

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Notes

1. "The Inkwell Man," *The New York Times* (February 22, 1920): 9.
2. Tim Stack, "Private Dancers," *Entertainment Weekly* 859 (2006): 45-49.
3. My description of the working life at the Fleischer studio here is indebted to Mark Langer, "Working at the Fleischer Studio: An Annotated Interview with Myron Waldman," *The Velvet Light Trap* 24 (1989): 1-19.
4. Mark Langer, "Polyphony and Heterogeneity in Early Fleischer Films: Comic Strips, Vaudeville, and the New York Style," in *Funny Pictures: Animation and Comedy in Studio-era Hollywood*, ed. Daniel Goldmark and Charlie Keil (Berkeley: University of California Press, 2011), 30-44.
5. Ibid, 15.
6. Theodor Adorno and Max Horkheimer, *Dialectic of Enlightenment* (Stanford: Stanford University Press, 2007), 133-34.
7. Jeff Lenburg, *The Great Cartoon Directors* (McFarland: Jefferson, 1983), 105.
8. For Esther Leslie's analysis, see *Hollwood Flatlands: Animation, Critical Theory and the Avant-garde* (London and NY: Verso, 2002), 174-75.
9. See Mark Langer, "The Disney-Fleischer Dilemma: Product Differentiation and Technological Innovation," in *Screen Histories: A Screen Reader*, ed. Annette Kuhn and Jackie Stacey (Oxford: Clarendon Press, 1998), 343- 60.
10. Tom Gunning, "Moving Away from the Index: Cinema and the Impression of Reality," *A Journal of Feminist Cultural Studies* 18, 1 (2007): 38.
11. Lev Manovich, *The Language of New Media* (Cambridge: The MIT Press, 2002), 295.
12. Lev Manovich,"Animating the Instant: The Secret Symmetry between Animation and Photography," in *Animating Film Theory*, ed. Karen Beckman (Durham and London: Duke University Press, 2014), 37.
13. Andre Bazin, "Theater and Cinema," in *What Is Cinema?* trans. Hugh Gray (Berkeley: University of California P, 2004), 91.

14. Ibid.
15. Stack, "Private Dancers," 45-49.
16. Andre Bazin, "The Ontology of the Photographic Image," in *What Is Cinema?*, 14.
17. Richard Schickel, *The Disney Version*: *The Life, Times, Art and Commerce of Walt Disney* (Chicago: Ivan R. Dee, 1997), 169.
18. This interview was conducted in 1990. See Langer, "The Disney-Fleischer Dilemma: Product Differentiation and Technological Innovation," 357.
19. Christian Metz, *The Imaginary Signifier: Psychoanalysis and Cinema*, trans. Celia Britton,
Annwyl Williams, Ben Brewster and Alfred Guzzetti (Bloomington: University of Indiana Press, 1982), 7.
20. Ibid.
21. Gilles Deleuze, "Immanence: A Life," in *Pure Immanence: Essays on A Life*, trans. Anne Boyman (NY: Zone Books, 2001), 29.
22. Dudley Andrew, "The Neglected Tradition of Phenomenology in Film Theory," *Wide Angle* 2 (1978): 47.
23. Gilles Deleuze, "The Brain Is the Screen: An Interview with Gilles Deleuze," in *The Brain is the Screen: Deleuze and the Philosophy of Cinema*, ed. Gregory Flaxman (Minneapolis: University of Minnesota, 2000), 370.
24. Henri Lefebvre, *Rhythmanalysis: Space, Time and Everyday Life*, trans. Stuart Elden and Gerald Moore (London & NY: Continuum, 2004), 43.
25. The two dance sequences in *Snow White* (1937) and *Robin Hood* (1973) can be watched at https://www.youtube.com/watch?v=e4ia5TBmY78, accessed on Jan 1, 2015.
The dance scene in *Robin Hood* (1973) also recycled dance moves from *The Jungle Book* (1967) and *The Aristocats* (1970).
26. For a list featuring examples of recycled animation in Disney movies, see
http://disney.wikia.com/wiki/List_of_recycled_animation_in_Disney_movies, accessed on Jan 1, 2015.
27. *Modeling* (1921), the first cartoon of the popular *Out of the Inkwell* series, has already established a number of traits of the Inkwell format: a series of ink droplets that metamorphoses into Koko; a visitor who enters the studio space; the protagonist's (usually Koko the Clown) tendency to leave the cartoon world and fight for corporeal existence; the illusion of temporal continuity and spatial proximity of the animated space and the real studio space that is achieved primarily through match cutting; the use of the cel overlays at the moment when Koko jumps into the studio space to suggest seamless and continuous action. Unlike Koko who always jumps from the cartoon world into the studio world, in B*etty Boop's Rise to Fame* (1934), Betty asks Max with coquettish grace to give her a pen, on which she can sit and be moved into the studio space.
28. Charles Peirce, "Some Consequence of Four Incapacities," in *Peirce on Signs*, ed. James Hoopes, (University of North Carolina Press, 1991), 71.
29. Sergei Eisenstein, *Eisenstein on Disney*, ed. Jay Leyda (London: Methuen, 1988), 27.
30. Henri Bergson, *Creative Evolution*, trans. Arthur Mitchell, (Lanham: University Press of America, 1983), 308.
31. Eisenstein, *Eisenstein on Disney*, 19.
32. See Rey Chow, "Postmodern Automatons," *The Art of Art History: A Critical Anthology*, edited by Donald Preziosi (Oxford: Oxford University Press, 2009), 100-17.
33. Bergson, Creative Evolution, 305.
34. Henri Bergson, *Matter and Memory*, trans. Nancy Margaret Paul and W. Scott Palmer (London: George Allen & Unwin Ltd; NY: The Macmillan Company, 1911), 272-75.
35. Henri Bergson, *Time and Free Will: An Essay on the Immediate Data of Consciousness*, trans. F. L. Pogson (NY: Dover, 2001), 90.
36. Ibid, 108
37. Bergson, *Creative Evolution*, 308.
38. Ibid, 46.
39. Ibid, 46-48.
40. Bliss Cua Lim, *Translating Time: Cinema, the Fantastic, and Temporal Critique* (Durham: Duke University Press, 2009), 32.
41. For Bliss Lim's detailed reading of *Rouge* (dir. Stanley Kwan, 1987), see *Translating Time: Cinema, the Fantastic, and Temporal Critique*, 149-189. As Lim views it, point-of-view shot is traditionally understood as a cinematic device that indicates the person who sees, in one shot, and what is seen, in the other shot, exist at the same time. Spectators' expectation of a whole, homogenous space, however, is broken into pieces in Fleur's point-of-view shot. Instead, this reinvention of point-of-view shots bestows a traversal of space and time. The appearance of a static, homogeneous world gives ways to the awareness of a vibrational, heterogeneous space.
42. Gilles Deleuze, *Cinema 2: The Time-image*, trans. Hugh Tomlinson and Robert Galeta, (Minneapolis: University of Minnesota Press, 1989), xii.