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The Migration Of Forms: Bullet Time As Microgenre

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Only minutes into *The Matrix* (Larry and Andy Wachowski, 1999), the movie unveils its money shot, as though aware the audience is impatient for it. Trinity (Carrie-Anne Moss), clad in skintight black leather, punctuates a brief, violent hotel room fight by spreading her arms, rising into the air, and lashing out in a kick that sends one of her policeman attackers flying. She moves with an impossible fluid weightlessness, as does the camera, which revolves around her while the hapless cops remain frozen. Some ninety minutes later, another such miracle occurs. In a rooftop shootout, Agent Brown (Paul Goddard) unleashes a hail of bullets at Neo (Keanu Reeves), who arches backwards to avoid being hit. Again, action in the outside world slows to a crawl, the bullets scudding by, leaving expanding rings of compressed air in their wake. And again, the camera revolves to frame Neo in mid-fall, his overcoat flapping inches from the ground. (Fig. 1)

These breathtaking moments marked the debut of *bullet time*, or what one friend of mine calls "a romanticization of the pause."[1] Narratively, eruptions of bullet time signal escalating breaches in the rules governing the "vast neural-interactive simulation" that is the (diegetic) Matrix. Their consciousness freed by the revelation that reality is, in fact, virtual, protagonists Neo, Trinity, and Morpheus

(Laurence Fishburne) are able to *will* the suppression of gravity and the bending of time, rewriting the very fabric of the electronic nightmare in which they are trapped. Graphically, bullet time consists of an extended take during which the camera seems to move in a circle, holding a central actor in focus as action unfolds at different rates and indicating that hero and audience alike are perceiving events at "bullet speed." Ambient noise drops to a lower, sludgy register, only to rev back up to normal as the distortion ends. Often the *mise en scène* contains floating elements—bullets, spent ammunition, water droplets—whose slowed or stilled trajectories enhance the visual uncanniness.

Figure 1. Neo (Keanu Reeves) dodges bullets in *The Matrix*

Industrially, bullet time became a celebrity in its own right from 1999 to about 2003, organizing commercial, critical, and technical discourses around *The Matrix*. As shorthand for the visual excitement of its parent text, it anchored a blockbuster advertising campaign, appearing regularly in television spots and trailers. The DVD release used bullet-time scenes in its navigation menus and even featured it in a documentary entitled *What Is Bullet Time?* Critics and journalists were equally fascinated with the signature visual. David Denby wrote in the *New Yorker* of *The Matrix*'s "brazenly chic high style—black-on-black, airborne, spasmodic. The warring characters, hanging from invisible strings, fly through the ether at one another and then fight in a speeded-up, rhythmic version of kung fu that has the clickety-clack excitement of tap dancing" (194). Janet Maslin's *New York Times* review was similar: "the martial-arts dynamics are phenomenal (thanks to Peter Pan-type wires for flying and inventive slow-motion tricks)."

A *Newsweek* article titled "Maximizing the Matrix" chronicled the manufacture of bullet time, complete with step-by-step breakdowns and behind-the-scenes photographs, linking it to the movie's box-office success while tutoring viewers in the correct reaction ("Without fail, the audience cheers wildly—and it's the kind of response that has propelled *The Matrix* to the year's biggest opening" [Croal 64]). In a year dominated by state-of-the-art digital filmmaking, *The Matrix* won Academy Awards in every category for which it was nominated, beating out the juggernaut *Star Wars: Episode I – The Phantom Menace* in visual effects, sound, and sound effects.

Meanwhile, bullet time did something even more remarkable: it *traveled*. Seemingly overnight, its distinctive brand of slow motion spread to other movies, making guest appearances in Shakespearean tragedy (*Titus*, 1999), a high-concept television remake (*Charlie's Angels*, 2000), a caper film (*Swordfish*, 2001), a teenybopper SF (*Clockstoppers*, 2002), and a cop/buddy film (*Bad Boys 2*, 2003). As a way of staging spectacle—high action, complex stunt work, the bending of physics—bullet time's migration crossed formal boundaries into animation, TV ads, music videos, and computer games. Almost as suddenly as it sprang on the public scene, however, bullet time seemed to wear out its welcome. Ads for everything from Apple Jacks and Taco Bell to BMW and Citibank Visa made use of it to spectacularize commodities. Put to scullery work as a sportcasting aid in the 2001 CBS Superbowl, parodied in *Scary Movie* (2000), *Shrek* (2001), and *The Simpsons*, bullet time became first a cliché, then a joke. Perhaps its nadir was *Kung Pow: Enter the Fist* (2002), in which the Chosen One (Steve Oedekerk) dodges squirts of milk from an attacking cow in a shot-for-shot remake of Neo's rooftop battle. (Fig. 2)

Figure 2. Udder time: The Chosen One (Steve Oedekerk) battles a cow in *Kung Pow: Enter the Fist*

All of this suggests that bullet time's *look*—not its underlying technologies or associated authors and owners—played the determining role in its proliferation. Its rise and fall echoes the fleeting stardom of another digital visual effect, the morph, in the early 1990s. Both received public notice as celebrated additions to Hollywood's bag of magic tricks, scrutinized both as technical processes in themselves and as the creations of special- and visual-effects artists.[2] Both spread virally, playing out their fifteen minutes of fame across a global mediascape. And both hint at the recent emergence of an unusual, scaled-down class of media objects: aggregates of imagery and meaning that move in cycles of quotation and parody like mini-movies in themselves, becoming first famous, then overfamiliar, then tiresome and aesthetically uninteresting. It is a well-known pattern in film studies. As John G. Cawelti writes, "One can almost make out a life cycle characteristic of genres as they move from an initial period of articulation and discovery, through a phase of conscious self-awareness on the part of both creators and audiences, to a time when the generic patterns have become so well-known that people become tired of their predictability" (200). Similarly, Steve Neale paraphrases a model of development put forth by Thomas Schatz wherein genres pass through stages of experimentation (in which conventions are established), classicism (in which conventions achieve formal transparency), and refinement (in which conventions become formally "opaque" and "self-conscious") (211-212).

But generic evolution of the type described here plays out over decades rather than months and years, and applies to a much larger aggregate: the two-hour feature film. By contrast, the rapid circulation and burnout of cinematic "quanta" like bullet time invites us to classify them as instances of genre on a compressed and accelerated scale, or what I will call *microgenres*. This essay uses the conceptual framework of the microgenre to explore the cultural lifespan of bullet time, treating it less as a singular special effect than a package of photographic and digital techniques whose fortunes were shaped by a complex interplay of technology, narrative, and style. I will consider the ways in which *The Matrix* "branded" bullet time both as technical process and stylistic convention, discuss bullet time's ancestry in image experimentation of the 1980s and 1990s, and finally look at *The Matrix* filmmakers' struggle to craft sequels that simultaneously preserved bullet time's appeal while varying it enough to ensure another "breakthrough." My

goal is to reframe the critical conversation around special and visual effects through a consideration of elements that fall outside the binaries of realism versus illusion or spectacle versus narrative. By considering instead the question of how special and visual effects *age*—following trajectories across and among texts, moving along chains of quotation and mimicry, existing not just synchronically but diachronically—I hope to shed light not just on bullet time, but on the changing behavior of visual texts in contemporary media. A genealogy of bullet time has much to tell us about how attention-getting spectacles are designed and manufactured and about the competition and reproduction of such spectacles in a fast-evolving ecosystem of mediums and technologies. This genealogy also reveals much about the hidden legal connections and obstacles that structure the field of intertextual circulation as well as the behavior of such intertexts in a YouTube era of narrative splintering and resequencing. First, however, we must ask how these questions have been framed in special-effects scholarship to date.

Swap that Shot: Comparing and Contrasting Special Effects

Michele Pierson (2002) argues that special effects do complex cultural labor, functioning not just within the cinematic apparatus as representations or illusions but outside the movie theater as "objects of scientific curiosity, aesthetic appreciation, or even vocational inspiration" (7). Much remains to be discovered about the underpinnings and implications of this activity. Popular and influential special effects like Willis O'Brien's stop-motion ape in *King Kong* (1933), Douglas Trumbull's slitscan Stargate in *2001: A Space Odyssey* (1968), or WETA's digital armies in *The Lord of the Rings* trilogy (2001-2003) beg to be understood in their historical materiality: as artifacts possessing lineages and trajectories; as commodities wending their way through industrial circuits of image production and consumption; and as public presences consolidated through the discourses of journalism and fandom.

Such concerns run afield of traditional academic perspectives that frame special effects as problems of realism versus illusion. In part, this stems from a tendency of such scholarship to focus on the science fiction genre, in which fantastic visuals play a relatively straightforward role in bringing strange creatures and settings to life. "For many viewers," writes Barry Keith Grant, "the value of (that is to say, the pleasure derived from) science-fiction movies is determined

by the quality (synonymous with believability) of the special effects. For these viewers, nothing destroys the pleasure of a science-fiction movie more than seeing the 'seams' of a matte shot or glimpsing the zipper on an alien's bodysuit" (22). In a similar vein, Albert La Valley notes that "too often in science fiction films, we can see the bad matte line (watch the tiger in *Forbidden Planet*), the poor rear projection, and the miniatures which detonate like a bunch of matchsticks (which they often are). The tricks do not work and the plot is interrupted" (146). In more theoretical terms, Stephen Prince has addressed the threat posed by near-photorealistic CGI (computer-generated imagery) to filmic realism. "What is new and revolutionary about digital imaging," he writes, "is that it increases to an extraordinary degree a filmmaker's control over the informational cues that establish perceptual realism. Unreal images have never before seemed so real" (34).

Despite their differing focuses, these arguments share certain assumptions: first, that special effects "work" only at the level of believability (that is, the degree to which they "fool" the viewer); second, that the feat of *trompe l'oeil* is an inherent quality of the special effect itself (regardless of who is looking at it, and when); third, that special effects follow a teleological path of continuous improvement (with the advent of CGI suggesting that we are approaching the point where, in Mark Langer's words, "we can no longer distinguish between reality and fantasy" ["The End of Animation History"]). While productive in its own right, the pitfall of this reasoning is that it idealizes the moment of first contact with special effects, ignoring any comparative work that might be done by spectators before and after viewing. The notion that an effect can be revisited over the years, evaluated anew from one viewing to another, is discarded. Thus, film and media studies have trouble engaging with the *dating* of special effects.

More noticeably than other filmic elements, special effects preserve specific aggregates of narrative and technological practice like insects in amber. These snapshots work against the impression of novelty with which effects seek to fool the eye in the most up-to-date manner possible: what Sean Cubitt (1999) has termed "the rhetoric of the unprecedented" (116). But states of art change over time; audiences in different decades can disagree. Richard Rickett points out the double logic of this aging, which robs past effects of their initial, intended appeal while driving innovation in the present. "As

the moving pictures developed," he writes, effects "grew increasingly sophisticated to match changing audience expectations. What thrilled in one decade seemed quaint and creaky in the next. The animated dinosaurs of *The Lost World* (1925) would have made audiences of the 1950s laugh, just as the monsters of the 50s held no terror for viewers in the 80s" (8). Pierson's more nuanced take on the phenomenon is worth quoting at length:

> Images of the incredible shrinking man in flight from a cat many times his size or in mortal combat with a tarantula declare themselves tricks through their sheer impossibility. The wonder of these effects lies in speculating about how they were achieved or *alternatively, and more satisfyingly, in being able to identify their improvement on older methods* of combining images filmed at different times (e.g., the filming of live action in front of a screen on which another film is being projected). What made traveling mattes an improvement on older techniques for combining film images was their ability to mask their techniques of illusion more effectively. But like any special effect that functions in this way *their effectiveness was quickly dulled by repetition* (110; emphasis added).

By this logic, no effect, even those we see in theaters today, is immune to the passage of time and the changing competencies of audiences, whose appreciation of the latest spectacular production is predicated on their familiarity with—and shifting critique of—its ancestors. Even the foundational text on cinematic science fiction, Vivian Sobchak's *Screening Space*, begins its chapter "Images of Wonder" with an admonition that both acknowledges and downplays the complex work of special-effects reception.

> Although a great deal has been written about the images in science fiction (SF) films, most often that writing has been more descriptive than analytic. ... Instead, discussions of the visual surface of the films have usually seemed to degenerate into a delightful but critically unproductive game film enthusiasts play: "Swap that Shot" or "The Robot You Love to Remember." Although there is absolutely no reason to

> feel guilty about swapping nostalgically remembered images like baseball trading cards, it does seem time to go beyond both gamesmanship and nostalgia toward a discovery of how SF images—in content and presentation—function to make SF film uniquely itself (64).

To be fair, Sobchack's seminal work predates by several years the studies of media fandom which argue that "swap-that-shot" exchanges can in fact constitute meaningful engagements with popular texts (see Jenkins 1992; Tulloch and Jenkins 1995; Brooker 2002). What she terms "gamesmanship and nostalgia" might be recast in current terms as practices wherein avid viewers compare and critique narrative elements (plots, settings, characters) and production contexts (auteurs, techniques, economics) as transactions in an economy of subcultural capital. Fans draw upon specialized personal archives and mental indexing systems developed through their own idiosyncratic histories of textual travel: itineraries of nomadic raids on privately owned media territories. Fan communities, as well as the unauthorized knowledge bases they share, rely precisely on such "delightful but critically unproductive" activities.

Studies of special effects thus run the risk of falling into ahistorical formalism, neglecting the activity of audiences who follow effects work as a technical and aesthetic category in itself. These audiences fall outside the binaries thrust upon them—immersion in the image versus appreciation of movie magic—just as special effects themselves demonstrate stylistic continuities and developmental arcs unaddressed as yet by any critical vocabulary. In short, characterizing special effects *only* as effects, and viewers *only* as amnesiac consumers of spectacle, renders invisible the actual processes of special effects' reception and production: a spectatorial logic of continuities and comparisons, and a corresponding industrial logic of citation and circulation. This logic is particularly evident in the story of bullet time's development – a story that in one sense begins with *The Matrix*, but which, as we shall see, actually possesses a much larger history.

Something Old, Something New: Bullet Time's Predecessors

According to Visual Effects Supervisor John Gaeta, bullet time's development began with the Wachowski Brothers' detailed vision of dystopian virtual reality, inspired by literary SF, Japanese *manga* and *anime*, as well as kung-fu movies whose signature use of

slow-motion, wire-based martial-arts brawling is perhaps the dominant link in bullet time's chain of aesthetic kinship. For the special-effects sequences, Gaeta worked from the directors' demand for a visual logic of action that would show "opponents diving at one another in hyper-slow-motion with guns blazing, pummeling each other while unloading their clips. Meanwhile, the camera covering the action would be running at speeds between 300 fps [frames per second] and 600 fps, making 360-degree moves around the combatants as they spiraled through the air" (Magid, 50).

Gaeta's task was to reverse-engineer this pre-visualized imagery, a mélange of script treatments, storyboards, conceptual art, and CG animatics, to arrive at the target illusion. After much experimentation, he opted for a solution merging photographic and CG elements (Robertson). Bullet time utilized more than one hundred still cameras arrayed in a circle of variable height (the "flight path" of the finished shot) aimed inward at an actor situated before a green screen. Each camera was tripped sequentially as action occurred, generating a set of frames that were then digitally stitched together to make a 360-degree image. Finally, the resulting animation of twisting, turning actors was composited against a background whose rotation corresponded to the arc of what was essentially a virtual composite camera. (Dependent on computers for its existence, the bullet-time camera is perhaps better described as a phenomenological construct that inverts traditional modes of cinematographic recording. Instead of multiple exposures from a single run of film through a unitary mechanism, bullet time blends many single shots into an apparently unbroken take. It is, in a sense, only the *idea* of a camera, its actual referent an army of lenses.) This process, which Gaeta dubbed "Flo-Mo," had its physical counterpart in custom-built hardware, an array of cameras resembling "a highly flexible watchband" (Magid, 52).

Despite Gaeta's claims that bullet time originated with the Wachowskis' use of Flo-Mo, in truth this particular special effect existed long before *The Matrix*. In the 1980s and 1990s, the effect appeared in the works of multiple artists and circulated under a variety of names, including Time-Slice, Timetrack, the Muybridge Effect, multicam, virtual camera movement, time-suspension, the frozen-moment effect, and *temps mort* ("dead time"). The sheer number of terms, techniques, and artists that can lay claim to bullet time's origins seems extraordinary. However, it becomes more understandable when

we consider special effects as microgeneric units following their own unique logic of development, diffusion, and aging. I will consider just two of bullet time's alternate existences here: Tim Macmillan's Time-Slice and Dayton Taylor's Timetrack.[3]

Macmillan, a British painter and photographer, received his bachelor's degree in fine art at the Bath Academy of Art in 1982. Interested in the intersection between Cubism and contemporary imaging technologies, he began experimenting with what he initially called frozen-time photography. While his early efforts involved handmade photographic emulsions and photograms, he later devised mechanisms similar to Gaeta's: multiple camera rigs using a single length of 16-millimeter film threaded through a long channel and exposed simultaneously to achieve "a perpendicular tracking shot through a space ... while the viewer experienced a move through space, time was frozen" ("Early Time-Slice Cameras"). Over the next twenty years, Macmillan continued to develop his technologies and signature look, doing work in TV commercials and feature films as well as art installations and directing his own films for the BBC. In 1997, he established his own company, Time-Slice Films Limited.[4]

Early Time-Slice videos such as "Jump" and "Dog" run only a few seconds, freezing man and canine in midair while the point of view revolves around them. By the late 1980s and early 90s, Macmillan's version of frozen time was popping up in BBC promotional spots and television features. Beginning in 1996, the effect spread to music videos and television ads in countries outside the United Kingdom, contributing to a critical mass that led to bullet time's first multinational exposure in the Gap's "Khakis Swing," directed by Matthew Ralston and featuring effects by the production house Steele VFX. During this time, Macmillan's technological base evolved through a series of increasingly sophisticated camera setups—the Macro Rig, Insect Rig, Linear Rig, and so on—enabling higher resolution and larger scales of film track and image capture. These developments were reflected screenside in ambitious permutations of the frozen-time aesthetic, such as a Del Monte ad (2000) in which a man strolls through a static beach scene: seagulls with blurred wings hang in the air like Christmas ornaments and statue-like soccer players strain to block a motionless incoming ball, beneath which the wryly smiling protagonist ducks. Macmillan is, of course, aware of bullet time's proliferation in the hands of other authors. His website notes "the emergence of a plethora

of similar camera rigs or arrays. As the concept disseminates through film and television and as the software needed to compile, track, stabilize, and interpolate between the adjacent frames improves, we are now experiencing a tidal wave of the frozen-time effect in TV commercials and feature films" (www.timeslicefilms.com).

In the face of this "tidal wave," another bullet-time innovator, Dayton Taylor, sought authorship status in both public and legal forums, selling his story to magazines such as *American Cinematographer* and *Scientific American* (Stix) while pursuing legal protection for his apparatus. Inspired by Chris Marker's experimental film *La Jetée* (1962) as well as Industrial Light and Magic's work on *Indiana Jones and the Temple of Doom* (1984), Taylor experimented with still and motion-picture photography as an undergraduate at the University of Colorado in the mid-80s (Taylor, 93). He was intrigued by the metaphysical implications of the match cut, a staple of continuity editing that links disparate shots around shared graphic, spatial, or kinetic elements. Taylor built a simple master-slave camera setup that captured one instant (a man exhaling cigarette smoke, for example) from two different angles. He fell in love with the resulting visual complex: "I found the pairs of pictures my cameras took to be fascinating because the uncanny simultaneity was so evident in them. I shot hundreds of pictures with this pair of cameras, choosing subjects that I felt would emphasize the uniqueness of the simultaneity of the images: objects in the air, people in motion, etc" (94). Over several years, Taylor refined his techniques, constructing prototypes of multiple-camera rigs—"a modular system comprising an unlimited number of tiny 35mm still cameras which all shared a common stripe of film" (ibid). Taylor is noteworthy for his dogged pursuit of a patent for the Timetrack system. The resulting patent, approved in August 1997, describes a "system for producing time-independent virtual camera movement in motion pictures and other media," calling for "an array of cameras ... deployed along a pre-selected path with each camera focused on a common scene."[5]

As part of the patent application process, Taylor detailed a history of similar inventions, which he terms alternative "multiphotographic systems for producing three-dimensional images." This list comprises more than a dozen patents issued between 1965 and 1993. Such footnotes suggest that bullet time's history deepens and ramifies the more closely we examine it. They also suggest the ultimate inability of

the patent process to ensure monopolistic control over anything other than a particular configuration of technology—leaving bullet time available to anyone who wishes to duplicate its surface attributes. But unfixable authorship and ownership have not stopped the efforts of one filmmaker after another to claim bullet time in the public mind. An article on Timetrack published in 1997 emphasizes the unique challenges posed by this visual arms race:

> [Dayton Taylor has] managed to rope in a handful of investors, including Steven Seagle, who writes for the *Sandman* comic books. He's landed a few advertising jobs from clients who like the effect. And thanks to the mediations of Roger Ebert, he's caught the eye of the potentate of high himself, Steven Spielberg. Of course, what this wave of enthusiasm amounts to will depend a great deal on what Timetrack becomes. A letter from Spielberg to Ebert, included in Taylor's press kit, illustrates the point well; between encomiums, the director finds himself wracking his brain "trying to think about applications for this art form/technology." Unless Taylor can suggest some meaningful reasons to use his brainchild sometime soon, it could easily go the way of technologies like Q-Sound. (Lindsay)

Throughout the 1980s and 1990s, then, bullet time's trajectory was shaped by forces of economics ("roping in investors") as well as popularity (finding clients who "like the effect"). Specific implementations of the effect helped determine its fortunes, but were threatened constantly by obsolescence and irrelevance (going "the way of Q-Sound"). During this time, bullet time floated freely among narrative situations as different as those in Joel Schumacher's *Batman and Robin* (1997) and Vincent Gallo's *Buffalo 66* (1998). Judging from one pair of films, the visual effect nearly became codified as shorthand for faster-than-light travel. Both *Lost in Space* (1998) and *Wing Commander* (1999) invoke the effect when spaceships zoom into hyperspace, suspending astronauts in midair for a few seconds before their craft emerge into normal space-time. Though developed by two different effects houses, the frozen moment/hyperspace sequences in these movies play almost identically, down to the use of a nearly silent soundtrack. Had bullet time's fortunes played out differently,

then, *this* might have become its accepted generic home: not leather-clad rebels in combat against a prison of simulated reality, but starship crews experiencing the reality-bending effects of hyperspace.

Each of the above instances had its own creators and its own means of achieving the target illusion, a key factor in bullet time's ability to adapt and transmit itself across media and genre boundaries. Furthermore, the effect circulated unimpeded by intellectual property law. The techniques and conventions of cinematographic engineering circulate within an unregulated field of citation, in which copyright applies feebly if at all. Yet ownership of a kind does get established at the level of stylistic signature and a kind of brand consciousness. Any cinematographer can choose to shoot in deep focus, but it is principally Gregg Toland and his work on *Citizen Kane* (1941) with whom the technique is associated. Similarly, if the label *bullet time* now adheres without argument to *The Matrix*, it does so not through some originary essence, but through a lucky synthesis of existing technologies and a narrative that cemented certain textual and visual meanings in the public mind. (Hence the importance of bullet time's framing material—the shots and narrative content that precede and follow the effect, assigning it a particular set of affordances such as "kung fu cyberpunk.") In the moment of its branding, bullet time's historical traces were retroactively organized under *The Matrix*'s authorial field. Pre-*Matrix* appearances of the effect are now spoken of colloquially as *Matrix* moments, or—more precisely but no more logically—as developmental steps toward *The Matrix*.

Nevertheless, it was *The Matrix*'s proprietary packaging of these elements that caught on in the public imaginary. 1999 marked the moment at which bullet time's heretofore itinerant troupe of signifiers stabilized within a particular narrative and stylistic frame, corralling its meanings and kicking off a chain of citation that would end, four years later, in archness and decay. How did *The Matrix* achieve this stabilization? And what finally happened to rob the effect of its appeal? To address these questions is to confront the question of what, exactly, is doing the migrating – a process, a shot, a sequence? There are two reasons for the difficulty in defining it. First is the definitional difficulty posed by special effects themselves. As Christian Metz and his successors have demonstrated, there are many ways to map the manipulation of motion-picture imagery, ranging from the overly general to the overly specific. To describe all cinema as trickery is

philosophically provocative, but fails to explain why certain classes of image are considered more or less "special" than others. (That is, within a field of industrial image production, what ends and whose interests are served by labeling one shot as artificial and another as real?) At the other end of the spectrum, categorizing special effects according to the processes by which they were achieved (e.g. distinguishing between stop-motion and CG animation, or between painted matte shots and front-screen projection) may be appropriate to technical discussions or how-to articles. When it comes to questions of theory and history, however, this approach seems fine-grained to a fault, paying little attention to the plasticity and combinatorial fluidity that drive optical innovation.

More damningly, both taxonomic extremes reinscribe a fundamental misrecognition of the way effects acquire their semiotic identities: the assumption that special effects work only at the level of the *shot*. As the preceding discussion has shown, effects draw meaning not just locally from their constitutive elements (fragments of image composited together to simulate one unbroken take of film), but globally from their surrounding contexts (narrative, character, *mise en scène*, and genre). Scenes, sequences, even the films in which visuals are imbedded help to dictate special effects' reception; it was not bullet time itself, but *The Matrix*'s particular enframing of it, that stabilized the effect sufficiently to carry it through a series of citations in other domains. Along with designer sunglasses and tight-fitting leather, the effect involved, in Jeffrey Sconce's words, "looking cool while you duel. ... Ostensibly a dystopic film about the 'horrors' of virtual imprisonment, *The Matrix* nevertheless contributes to the reigning romance of cyberspace by presenting virtuality as a hipster playground of high-action and high-fashion" (204). David Edelstein goes further, citing bullet time as *The Matrix*'s defining breakthrough while noting that the "technology wouldn't have such a kick without the Wachowskis' stylistic (and philosophical) underpinnings":

> Tales in which the world turned out to be a computer simulation have been told onscreen before, as recently as *Dark City* (1998) and *The Thirteenth Floor* (1999) —neither a hit. A science-fiction screenwriter I know said he'd been stewing over his own simulated-universe project for years when *The Matrix* came out. "What I didn't think of," he said sadly, "was the

> martial-arts angle." And that's the crux of it. ... In a funny way, the Wachowskis—who hired Hong Kong's greatest action choreographer, Woo-Ping Yuen—have provided a retroactive explanation for why warriors in Hong Kong movies can fly: They're in a kind of simulation, a Matrix.

This perspective calls our attention to the *motivation* of special effects and pushes us toward a more systemic understanding of their operations. The moment of the attraction may indeed win fleeting awe from viewers. But the situation of that moment within a string of others—and the family resemblances linking the moment to similar instances in surrounding media—contribute to an intertextual kinship that plays a central (even determining) role in the acceptance, or rejection, of a given special or visual effect.

Dizzying Overfamiliarity

While the migration of bullet time bypassed academic notice, it did not escape the attention of critics and fans—groups as quick to mock failure as they are to celebrate success. Some of this criticism targeted *The Matrix*'s own auteurist aura. Responding to a May 2003 *Wired* article on the sequel *Reloaded*, one online fan wrote:

> Hate is a strong word that I hesitate to use about someone I've never met, but I have really despised [John Gaeta] since the first time I heard him open his mouth. This was mostly because he really acts like he invented the "bullet time" effect, but really all he and his team did was enhance it from a stopped-time-lapse effect into a variable-time-lapse effect. The stopped-time version was used in TV commercials (and possibly a music video) prior to the first *Matrix*. Gaeta constantly stands on the shoulders of those that came before him (and his team of hard-working artists) and gives them no credit (Anthony).

As early as 1998, some commentators already considered the visual effect passé. "The frozen moment is not new," pointed out one writer. "It has become a standard gag, repeated in so many different clips and commercials ... that it has created a kind of dizzying overfamiliarity" (Linnett). If this obituary seems premature—after all, bullet time had yet to find its widest audience—post-*Matrix* feedback pulled no punches, targeting any film that dared to make "straight" use of the

effect. "The four-year cribbing of *The Matrix*'s bullet-time flies and flips certainly will continue, but never so egregiously as director Len Wiseman and his cronies have done here," one reviewer wrote of the vampires-and-gunplay film *Underworld* (2003). "They expect us to drool at the cool with absolutely no other goal in mind than to provide visual mimicry of heroes like Neo ... with a cheaper budget and, worse yet, even cheaper imagination" (Rogers). Even more definitive was a review of *House of the Dead* (2003): "OK, that whole *Matrix* 'bullet-time' stop-motion special effect, where the camera circles a character—midbrawl—to show 360 degrees of slow-motion bullets, kicks and sword-stabs? Officially over. As in overused, worn-out, played. If Tarantino didn't hack it to death in *Kill Bill*, then the makers of *House of the Dead* do" (Moore).[6] A more considered analysis of the special effect's proliferation came from the *London Times*:

> In the summer of 1999 many people left the cinema wishing that all films could be like *The Matrix* ... Sadly, their wish came true. *The Matrix*, rather like Neo's stern-jawed nemesis Agent Smith, replicated itself and every action film since has copied, borrowed, or stolen bits of *The Matrix*. ... Advertising also got in on the *Matrix*-a-like act, with Levi's, Nike, Kellogg's, Bacardi Breezer and even Center Parcs all using familiar special effects to sex up their brands. Then there are the pop videos for Bon Jovi, Christina Aguilera and notably the now defunct boyband A1, who dodged bullets and bent the metaphysics of time and space in *Take on Me*. It has become so bad that the film's sequel, *The Matrix Reloaded*, out this week on DVD, looks like a rip-off of the original (Dee).

Once detached from the narrative, characters, and *mise en scène* of the original *Matrix*, bullet time no longer seemed astonishing but hackneyed. The ultimate victim of bullet time's success, then, was bullet time itself, and by extension the entire *Matrix* series. *Newsweek* described the dilemma in a cover story that designated 2003 "the year of the Matrix":

> Nothing from the movie has been swiped as often as "bullet time," the dazzling FX trick in which the camera appears to whiz 360 degrees around a central image. It was jammed into *Charlie's Angels* and

> parodied in *Shrek* and *Scary Movie*. If you watched the Super Bowl last year, you saw a crude version of it on Fox, which used the technology (cleverly, for a change) to show big plays from numerous angles. At first, [Producer Joel] Silver says, the Wachowskis were tickled by the copycatting, but soon they began noticing fight scenes—like the one in *Charlie's Angels*—that were shot exactly like theirs. "So they decided to create images that no one could copy," says the producer. "There's only two ways to do that: time and money" (Gordon 87).

Interpreting its visual effects' rampant appropriation both as praise and challenge, the filmmakers responded by taking bullet time to the next level. In the massive wave of publicity attending the first sequel, Gaeta emphasized a technology called universal capture (or "u-cap") which combined high-resolution scans of actors with fully-CG sets, synthesizing digital and photographic environments to an unprecedented degree. Maintaining his techno-utopian cant, Gaeta boasted of his ability to create "50 simultaneous events in a fluid, unending shot, whereas each of these events used to take us all day long to get a two-second piece with 40 takes to perfect. ... And I can have all this action make sense and interrelate, and I can follow it with a God's-eye camera moving at speeds that would tear an ordinary camera apart. The system will escalate martial arts into a now-transcendental super zone. I think there are going to be people in Hong Kong and Asia who will look at this film and just be, like, flipping" (Edelstein).

Although *Reloaded* and (to a lesser extent) *Revolutions* were indeed profitable, audiences failed to flip. Instead, they accused the films of squandering the first *Matrix*'s promise. Much of the criticism centered on the sequels' visual effects, whose abstraction, excess, and artificial cleanliness left audiences confused and unsatisfied. Attempting to "create images that no one could copy," bullet time's popularizers seemed to encounter migration's inverse: their professed aim of origination and authenticity forced them into a new aesthetic territory in which the only forbidden act was the reproduction of "classic" bullet time. By taking effects to the next level, the *Matrix* makers were outdone by their own success.

Conclusion: Thinking in Microgenres

When examined closely, visual effects such as bullet time

confound claims of authorship, circulating beyond the boundaries of copyright and intellectual property. While a specific means might be patentable (the physical materials of camera and film mechanism, or software used to generate 3D graphics), there is no way to protect an end that is nothing more or less than a *look*. The history of special effects and cinematography overall is rife with instances of differing approaches used to produce the same, or similar, results. While titles, characters, and dialogue might fall under legal protection, how does one copyright a zoom or pan? The lighting scheme specific to *film noir*? The rhythms of cross-cutting—even something as specific as the trickery Jonathan Demme uses in the climax of *The Silence of the Lambs* (1991)? Or the so-called "Hitchcock zoom," a simultaneous track-in and zoom-out actually developed by cinematographer Irmin Roberts for *Vertigo* (1958) and replicated in dozens of media texts since?[7] The more closely we scrutinize a technique, the clearer it becomes that there is no single way to achieve it. This insight, if unfriendly to the interests of commercial property holders, is nonetheless at the heart of cinematic evolution and variegation. Yet the potential for endless variety is checked by the emergence of conventions (narrative, visual, stylistic) that temporarily stabilize the play of signifiers enough to ensure recognition from one instance to the next. All cinematic authorship can be seen on one level as a bid for this stability—an attempt to mint a recognizable signature—and hence a particularly modern evolution of branding.

Microgenres, I have argued, provide a means to describe the breakdown, resequencing, and replication of visual texts. Occupying a middle ground somewhere between individual shot and full-length movie, microgenres call for a recalibration of our understanding of how such texts are put together, but also how they are taken apart by audiences who discuss and evaluate the good stuff—"the robot you love to remember." Microgenres provide a potent descriptive tool for the current mediascape, characterized by multiplicity, convergence, and transmedia storytelling systems (Jenkins, 2006). Indeed one phenomenon of the moment, the website YouTube, seems to deal in nothing *but* microgenres. At the same time, microgenres offer a way of revisiting longstanding debates in film and media studies. More particularized conceptions of genre, that is, can help media studies "see" generic operations and transformations in higher resolution and greater historical specificity. Cawelti claims that the late stages

of generic development mark the point at which "parodic and satiric treatments proliferate and new genres gradually arise" (200). If this is so, then the migration of microgenres offers a productive means of reconceptualizing the nagging problems of genre study: how genres arise, intermingle, and fade, only to give rise to new genres or exciting reinventions of old ones.

I do not raise these points to reify some excessively formalistic notion of genre. Rather, I hope that microgeneric thinking will offer a way to reconcile the two approaches into a dynamic, descriptive model of media behavior, composed equally of fixed/owned/stabilized territories and unfixable/citable/publicly-held lands. Genre is, almost by definition, that which cannot be copyrighted. One can own a text—and use the law to prevent other texts from too closely approximating it—but one cannot own the field of cultural meanings and archetypes bound up in "the western," "the horror film," and so on, any more than one can regulate the use and reuse of iconography and conventions specific to those genres. By considering media texts as flows of migratory elements at differing scales and speeds, we bring together formal and cultural perspectives to see texts in both their synchronic and diachronic dimensions—as timeless systems and historically-determined practices. Microgenres like bullet time mark not just the latest catchy visual, but the corresponding movement of materials and personnel through networks of labor and capital. They mark ongoing points of contention and agreement between producers and audiences. They set the agenda for the replication of cultural products across a wavefront of industrialized iteration. Ultimately, they condense and localize the interweaving of media, technology, and storytelling, merging the ineffable and the pragmatic. Like many special and visual effects, microgenres hover at the edge of our conceptual horizon, tantalizing us with their elusive reality, their impossible solidity.

Notes

[1] My thanks to David Surman for this quote. For their comments and suggestions on this essay, I am also grateful to Barbara Klinger, Joan Hawkins, Patty White, Sunka Simon, and Kristen Whissel.

[2] For an extended discussion of the morph in both historical and theoretical terms, see Sobchack (ed), 2000.

[3] Michel Gondry, a director of music videos, TV ads, and feature films

(most recently *Eternal Sunshine of the Spotless Mind*, 2004) is also credited by some with originating the effect in spots for Smirnoff and Polaroid (1996). His comparatively early use, along with the wide audience his work reached, mark him as a major contender in the origination sweepstakes. Gondry himself, however, was sanguine when confronted with the work of yet another innovator, the French director Emmanuel Carlier:

> "Sometimes ideas are in the air," says Gondry. "Basically, my technique is simpler than Carlier's. It's just two cameras, one in each hand, and you can do it wherever you want. You take two shots and morph in between. The two methods are complementary. Mine is more fluid in terms of the motion, the other has more layers in it" (Linnett).

[4] For a complete record of Macmillan's productions, as well as a discussion of his camera technologies and underlying philosophy, see his official website at <www.timeslicefilms.com>.

[5] U.S. Patent No. 5,659,323. Issued 19 August 1997.

[6] It should be noted that by this point the effect is being credited with appearances it did not even make – *Kill Bill Volume I* (2003) contains no bullet-time shots.

[7] Dan Auiler, *Vertigo: The Making of a Hitchcock Classic* (New York: St. Martin's Press, 1998), 66. Like bullet time, the Hitchcock Zoom migrated, appearing with different names (trombone shot, contra-zoom) in different films (a partial trajectory includes *Marnie* [1964], *Le Samourai* [1967], *Jaws* [1975], *Goodfellas* [1990], *Safe* [1995], and *Panic Room* [2002]). One online satire of filmmaking staples includes the following guidance on "trombone zooms: Most notably used in *Vertigo* and *Jaws*. Sometimes known as a trombone shot, this always looks good. Use it as often as you can. It is particularly useful when a character gets a piece of bad news as it visually denotes that their world has altered" (Cousins).

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