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Towards Tower 37: A Director's Journey

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TOWARDS *TOWER 37*: A DIRECTOR'S JOURNEY

A Thesis Presented

by

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ACKNOWLEDGMENTS

Without the creative efforts of my crew, and the endurance of my family, *Tower 37* would be nothing more than some hard-to-read notes in a journal.

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CHAPTER 1

INTRODUCTION

I make films to get people to look more deeply at the seemingly simple situations they encounter in life. As we age, and as we are met with conflicts of one sort or another, we naturally draw upon our prior knowledge and experiences to help navigate these new problems. Though this may allow us to conveniently resolve conflicts without much thought (and thus return to the parts of our lives we were enjoying), it carries with it at least two great risks. First, since the new situations may in fact be substantially different from the old ones, this approach may provide us with the wrong answers. And second, this "auto-pilot" approach to handling new experiences discourages life-long learning. When humans refuse to continue questioning, adapting, and discovering after they reach maturity, old ideas remain in circulation far after their usefulness has expired.

My approach to accomplishing this goal relies on deception. I attract unsuspecting audiences with familiarly-stylized, computer-animated visuals and traditionally-structured narratives. These stories are set in realistic-enough worlds (with familiar laws of physics, light, and the like) populated with characters who respond to stimuli in ways that are easy for audiences to empathize with. But after the audience has been lulled into thinking that their old experiences have prepared them for the story they are watching, I inject exposition that makes it clear those old ideas no longer apply. In other words, I force the audience to turn off their "auto-pilot" sensibilities if they want to truly understand the narrative. It is my hope that this active re-focusing on familiar-looking events continues, at least in some small way, beyond the end of the film.

With the animated film project documented in this thesis (*Tower 37*), I aim to utilize this same approach to initiate fresh conversations about terrorism, compassion, and ecological sensitivity. But running over 10 minutes in length, *Tower 37* is far too complex a project to independently produce with the same polish as a multimillion dollar studio offering. Luckily, an unexpected collision between my artistic desires and my career as an educator yielded the crew and studio structure necessary to bring *Tower 37* into existence.

This document chronicles the ongoing production of *Tower 37*. It begins with a close examination of the film itself, emphasizing the visual storytelling components that were the core of my MFA work (particularly character performance, camera, and editing). This is followed by a thorough discussion of the mechanism of producing the film: a sequence of experimental courses I have created and taught at Hampshire College over the past two years. The document then discusses my approach to the craft of directing before concluding with evaluative comments and a look ahead.

CHAPTER 2

THE FILM

Synopsis

Tower 37 is a story about the high cost of ignorance. When one party unwittingly steals the home of another, the victims are forced to execute a desperate plan to reclaim what was theirs. The film chronicles the events of that operation, telling the tragic story of their, ultimately, **Pyrrhic victory**[1].

Tower 37 begins with the arrival of two suited invaders (named Leed and Mule) at a massive glass spherical water tower in the middle of a desert. There are signs that this was once a lush, living environment which the tower has since desiccated. For instance, the tower itself sits in a lakebed that is completely dry save for some small remaining puddles.

Manning the tower is Operator, who sits in the enclosed office at the top of the tower reading a book. Unbeknownst to him, the suited figures manage to ascend to the top of the glass tower. Operator is jolted out of his reading by the sight of the suited figures on a security monitor, and he rushes outside of his office, armed, ready to defend the tower.

Operator is surprised to find that the figures are no taller than his shoe, and thus pose no obvious threat. He hardly notices their feeble attempt to detonate an improvised explosive on the top of the tower, and instead grabs one (Leed) to learn more about them. He pries off the helmet to learn that the tiny suits are filled with water, and that the inhabitants are some amphibious creatures he has never seen before. Though mesmerized

by the sight of the little creature, Operator returns to his office and drops the being into the full water pitcher to prevent it from suffocating in the air.

Leed snaps back to life in the water. The sight of him sends Operator to the office windows, binoculars in hand, to see if perhaps Leed came from the lake. A veritable sea of tiny faces greets Operator's stare and confirms his theory. With little hesitation, Operator rushes to the control center and begins draining the water out of the tower, returning it to the creatures in the lake even if it goes against company policy.

At the sight of this, Leed launches himself out of the pitcher and rushes out of the office. Operator follows. But they both see that it's too late: Leed's companion, Mule, has since grabbed Operator's forgotten weapon and has it aimed against the tower. Seeing his friend out of water and being chased by the gigantic Operator, Mule decides to finish the job they came to do and pulls the trigger on the gun. His last action has the intended results: the glass exterior cracks, and the tower begins to come down.

Before the tower collapses fully, Leed and Operator find themselves face-to-face for a moment of mutual understanding. Leed dives down in an attempt to survive the destruction; Operator accepts that he is doomed and spends his final moments seeing the world with his newly-enlightened eyes. The tower comes down in a huge burst.

The film ends with the lake being replenished and Leed's fellow amphibians enjoying the return of their home. Leed, however, remains scarred by the needless loss that accompanied this gain.

Background and Influences

Tower 37 literally began as a dream. In the dream, two suited figures travel across a desert towards a pure blue glass orb full of water. The giant, jewel-like sphere sits in an near-empty lakebed, a complete contrast to the waterless environment surrounding it.

Upon waking, it was clear that the two characters were on a quest to return the water to the lake from which it had been extracted. It was also clear that they would succeed. Exactly *how* was left to be determined, but the *why* was very clear: it had been stolen from them, and from all the other inhabitants of this once-hydrated region. They were on a mission to reclaim what was rightfully theirs.

Thematic

Tower 37 was shaped, in large part, by a 9/11 photograph by Richard Drew of a man falling from one of the World Trade Center towers (Figure 1). He is falling because he leapt out of the building, very clearly to his own death, and very likely to escape a more painful death by being burned, suffocated, or crushed in the building's collapse. There is a feeling of conscious desperation in that image, of full awareness of one's actions coupled with the inescapability of death.

Tower 37 tells a similar story to the Drew photograph about needless death at the hands of "terrorists." But because Leed and Mule are only trying to reclaim what was rightfully theirs in the first place, the film offers up much more ambiguous definitions of who the terrorists and the victims are than is typically found in the discourse on 9/11 in the United States. It unabashedly suggests that the innocent-seeming human victim is in fact guilty, by his association with an organization that had previously committed an egregious deed.

Figure 1: *Falling Man* by Richard Drew (2001)

Another thematic influence on *Tower 37* is the short animated film *Stationen* (1999). Both pit tired, struggling protagonists against an infertile desert and both highlight the importance of water in such a world. Both end up, ultimately, tragic. *Stationen* was also a visual influence on *Tower 37* in its use of a limited color palette and substantial image degradation.

Image Degradation and Camera Restriction

Computer graphics, as a medium, is built around tools that generate mathematically perfect images. Organic variation and complexity must be added manually (unlike live-action filmmaking or photography where these "natural" variations occur for free). Image degradation and camera restriction are two methods by which synthetic imagery can more closely mimic photography-based imaging techniques.

Image degradation, or, the purposeful "dirtying" of a digitally-generated image, was a process born in the visual effects industry: To seamlessly integrate computer-

generated elements with photographic elements, artists have to make the light response and the film grain of the digital images match that of the original 35mm negative, or else the synthetic and the photographic images won't mesh. Independent filmmakers, working completely with computer animation, use these same technique in films like *Stationen* and *Puppet*, to try and obscure the digital origins of these films (Figure 2 and Figure 3).

Figure 2: A frame from the animated short film *Stationen* (1999)

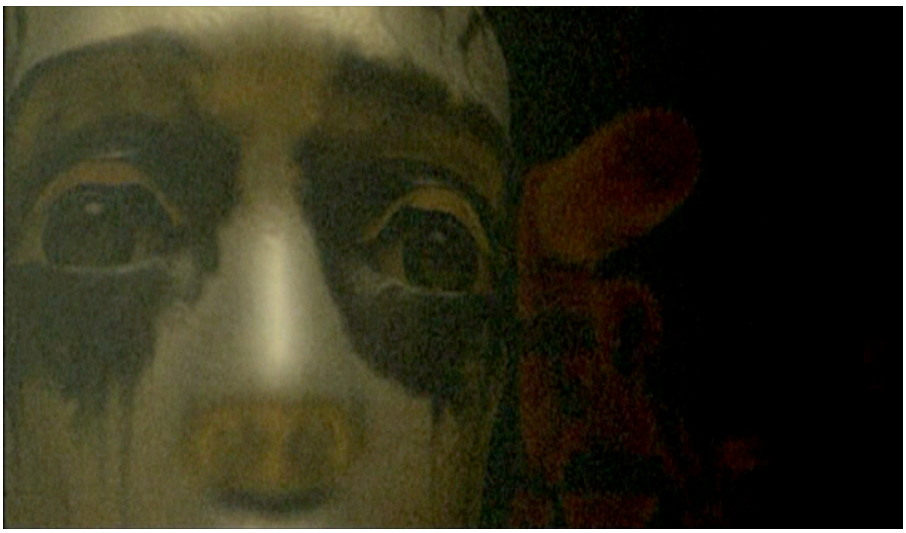

Figure 3: A frame from the animated short film *Puppet* (2002)

Image degradation has a curious effect on an audience's experience with a film. Depending on the degree of realism used in the degradation, such treatment can often re-cast computer animation into appearing as stop-motion animation, or, in extreme cases, live-action. The critical suspension of disbelief needed to fully engage with a fantasy tale is made easier, in my opinion, when the viewer can't determine how something was made. Films can take on almost magical qualities (real, yet, seemingly impossible) with these treatments.

Brad Bird, director of the animated feature film *The Incredibles* (2004), purposefully limited his camera choices in that film to physically plausible ones in most cases. Given the lack of physics in the virtual world of the computer, this is a completely self-enforced limitation I term *camera restriction*. By placing the camera only in locations that would be attainable if the film were shot as live-action, a director attempts to lend the film a veracity that it wouldn't otherwise have.

Image degradation and camera restriction are important components of *Tower 37*. For one, the virtual cameras used throughout the film are almost entirely plausible. This quality, combined with naturalistic camera wobble (another form of restriction), shallow **depth of field**, and in some shots, animation that mimics hand-held camera work, all support a "present" camera operator. A perceptible, imperfect presence behind the camera lends more actuality to the space of the film, more realism to the set, and, ultimately, more veracity to the otherwise completely virtual world of the film. In other words, the simple fact that the camera behaves in familiar, "real-world" ways in *Tower 37* positions the film in the space of the believable.

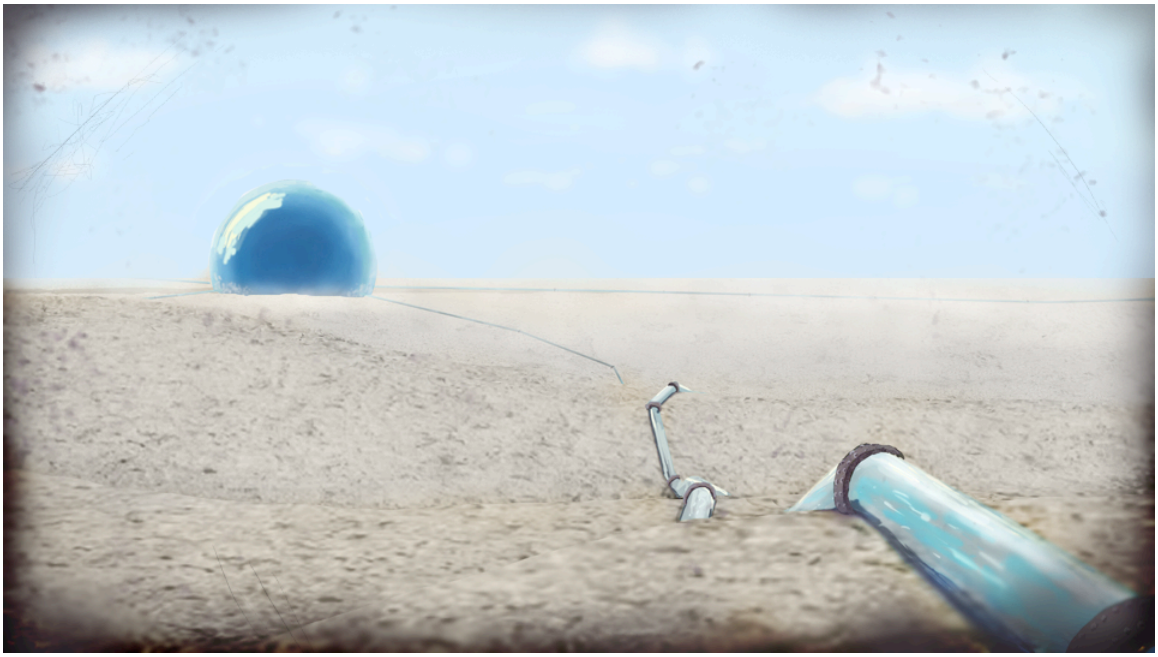

Figure 4: A color script image from *Tower 37* showing degradation

In addition to restricting the virtual camera, the individual frames of *Tower 37* will be degraded to reflect imperfect lens geometry, non-circular apertures, and other imagined imaging artifacts (Figure 4). Films like *Three Kings* (1999) and *Saving Private Ryan* (1998) both make substantial use of these techniques, though in strikingly different ways. In the former, the Director of Photography Thomas Newton Sigel "utilized an original technique in developing the film stock called 'bleach bypassing,' which entails skipping a bleach process in order to leave a layer of silver on the negative, making the image look washed out."[2] Super-bright exterior whites characterize this process, supporting the heat and intense sun of the desert even while seated in an air-conditioned movie theater (Figure 5).

Figure 5: A still from the film *Three Kings* (1999)

Figure 6: A still from the film *Saving Private Ryan* (1998)

The opening sequence of *Saving Private Ryan* thrusts the viewer into the D-Day assault at Normandy, in large part by thrusting the camera into the action and letting the images resolve as they may. Most shots are hand-held, many are out of focus, and some lenses even get dirtied by flying debris (Figure 6). Viewers are so accustomed to the

carefully-crafted frames of a multi-million dollar blockbuster film that a dirt smudge left on a lens carries substantial weight. An event like D-Day, after all, wouldn't lend itself to re-takes. The immediacy and urgency of the real assault is supported by each imperfection that is kept in the filmed re-creation. *Tower 37* attempts to reap some of these same benefits by use of degradation and camera restriction[3].

Avoiding Anthropomorphism

One of the main characters in *Tower 37* is, essentially, a sentient fish. This immediately recalls other animated fish such as Charlie Tuna from the *Chicken of the Sea* television commercials, and the characters in the feature films *Shark Tale* (2004) and *Finding Nemo* (2003). But in *Tower 37* the amphibious creatures are animated without anthropomorphism: They do not speak, and they are not prone to human-like facial expressions or displays of emotion. Throughout the animation phase of production, the emphasis on their motion was to above all be true to their design, not to follow some idea of how a human would respond in the same situation.

This decision recalls other animated characters, such as the forest spirits in Miyasaki's film *Princess Mononoke* (1997). The result of successfully implying the emotional states of sentient non-human creatures is that the film gains greater "believability" without necessarily striving for photorealistic non-fiction. No one, after all, would actually believe that the fish-creatures presented in the film actually exist. But when the creatures behave in ways that would *be believable if they did exist*, then an audience can more easily position themselves alongside the action, can consider what they would do in the same situations. In allegorical films like *Tower 37*, this gives the audience a more palpable experience with the film's lessons.

A Close Reading

Although substantial effects, shading, and lighting work remains to be completed, *Tower 37* is far enough along in production that it is possible to analyze how the story is being told through with the camera, the edit, and the performances of the characters. The following close reading of these elements not only offers insights into the author's directorial considerations, but it also positions the work within the context of similar narrative films, both animated and live-action.

The Opening Sequence

The film opens with a mystery: blurry, fast-moving sand, bleached out almost to the point of being unrecognizable. The mobile framing of the minute-long opening shot both poses and answers many questions for the viewer: Where are we? Why is there a water pipe running across the desert? Where is the water going, and where is it coming from? Why are all those pipes emanating from that glass ball full of water?

This is a classic yet effective approach to storytelling: offer certain tangibles to the audience, but don't give them everything. Keep people enough in the dark to keep them watching and wondering, but not so much that they tune out. Short films like *Maestro* (2005) do this quite literally, burying the audience in almost total darkness during the opening of the film. The brief glimpses of a cocktail shaker, a glass, and a robot arm show that someone or something is making a drink, but what? And for whom?

The first two minutes of *Tower 37* offer the viewer what could be considered a set of portraits of this unusual glass structure. These shots present its massive scale, its unblemished surface (save for a small building on the top), and establish its location: perched on a stout pipe above a near-empty lakebed. The stout pipe seems to be pulling

fluid from the ground, bringing it up into the sphere of water. Around the whole site is a fence, peppered with signs that read "37." The film's title (*Tower 37*) now resonates with our existing ideas of water storage, and despite the unusual design the structure does seem to be, in fact, a water tower.

This is a common trick. Many animations count on an audience's ability to transfer understanding from their world onto the fantastic world of the film. Through character poses and sounds, the Lowenstein's film *Balance* (1989) turns simple telescoping rods into fishing poles. The film *Burning Safari* (2006) presents glowing, transparent purple sheets as photographs, both in how they capture a likeness and how the characters interact with them. In *PGi-13* (2004), paper lamps are children's heads. An unfamiliar design shown functioning in a familiar way seems to be all an audience needs to accept the analogous object(s) and move ahead with the story.

The portraits of the tower are inter-cut with fast, uncertain shots of two figures (suited Leed and Mule) running along one of its smaller pipes. The back-to-back contrast of slow to fast, of wide lenses to tight zooms, and of full shots to close-ups portray two clearly different worlds on a collision course. This technique is reminiscent of the opening of Spike Lee's *Inside Man* (2006), where shots of the criminals assembling in their van are inter-cut with portraits of static features of the bank building. These two separate worlds collide when the van pulls up outside the bank. In *Tower 37*, the disparate groups meet when the suited figures arrive at the tower. Compared to *Inside Man*, *Tower 37*'s build up feels more hurried. The same technique used on the smaller time scale of a 10-minute film permits less patient investigation. At the same time, though, the sense of urgency is higher in the shorter work.

Introducing the Main Character

The meeting of the two different entities presented thus far in *Tower 37* (the tower itself and the suited figures), is punctuated by a 20-second vertical tracking shot that presents the massive scale of the former relative to the latter. At the head of the shot, the first suited figure (Leed) exposes two suction cups just as he looks up at what's in front of him. Clearly there is a climb in the future. But just as the camera grows dizzyingly high, the huge tower is instantaneously reduced to a small graphic on a computer monitor. This is a jarring transition in both scale and location, facilitated by compositional continuity of the tower's circular profile between the two shots. It presents the world of the former shot as being embedded in the latter. The opening of *Toy Story 2* (1999) uses this technique just as the audience is led to believe that Buzz Lightyear has been killed: no, it was just the death of a Buzz character in a video game. Ivan Kaplow's short *Puppet* closes with this same approach, presenting the strife-ridden world that the characters inhabit as simply a simulation on a computer[4].

This new location in *Tower 37* (the one containing the graphic display of the tower), is visited in a series of close-ups before wider shots reveal a figure sitting in the office reading a book. The purpose of the close-ups is once again to prolong the viewer's questioning period while offering up clues to the answers. Where is this? What am I looking at? Dials? Is that a control panel of some sort? A glass pitcher?

Though these are static cameras, they recall the technique employed by David Fincher in films like *Panic Room* (2002) and *Fight Club* (1999) in which a mobile camera was "freed" (by computer graphics) to creep through walls and ceilings, passing close to household objects that are not usually seen from such a distance. A Fincher-

esque extreme close-up of a stovetop grill in *Fight Club* transforms it into a mysterious and impressive physical construct. Once it's been successfully identified as a stovetop grill, however, the mysteries convert into a game between director and audience. The director is consciously showing the audience things they haven't seen before, and when the audience figures that out, there's a risk that the inner world of the narrative is abandoned, even if briefly. Fincher's films invite this meta-level consideration; *Tower 37* does not.

The introduction of the figure is through his belly. Like a lumpy version of the tower that opened the film, this belly fills the frame. It is massive. The insertion of a hand makes it human, and just as that's established, the camera goes wide to answer all the questions about this new environment: there's a big man (Operator), reading a book, in a small office-like environment with a control panel. His relation to the first two entities of the film (the tower and the figures) is implied by the tower's miniscule form on one of his many display monitors: he is somehow in a position of power relative to the tower, despite his distracted appearance. The audience may have just been curiously peering at all the controls and gizmos at his disposal, but he has his feet up, his eyes on a book, not looking at any of it. He may be in power, but he is certainly not paying any to what's going on around him.

The Two Collide

The film returns to the tower, focusing on the dirty water at the bottom of the lakebed from a high vantage point. The climbers crest the horizon of the sphere, and the limited range of focus lets the audience look at one or the other clearly, but not both. This contrast foreshadows Operator's understanding to come.

The sudden arrival of the climbers tells that time has passed, for they are obviously a good ways up from where they started. Though the front climber is moving steadily, he does cast a quick glance back to his fellow climber (who is carrying a much bigger load). The next few shots present them as making slow but constant progress up the side of the massive structure. One shot staged from within the tower presents the two as moving within the water itself. This is another bit of compositional foreshadowing.

A familiar, even trite, use of the cross-dissolve allows for another passage of time. The figures are now seen huffing and puffing at the top of the tower. After a moment of rest, and a comforting "how are you?" touch, the two continue plugging ahead. Another rack of focus coupled with a boom move upwards establishes a visual destination: the metallic office perched at the top of the tower. Another look back from the leader to the load bearer serves to further unite the two.

An automatic security camera catches the movement of the figures, and the signal is relayed to the same monitors that Operator had previously been ignoring. This is close to being pure uninflected shot selection as described by Mamet in *On Directing Film*. A shot of the figures walking, followed by a shot of a security camera, followed by a shot of the human's face serves to communicate the connections between them without needing to spell it out any more clearly. Doing any more than that, Mamet argues, is asking your audience to disengage from the picture.

But *Tower 37* puts Mamet's advice aside and follows this sequence with a very inflected shot: the security camera capturing one of the suited figures with an explosive device on the tower surface. It's the design of the device that does it: a stack of red dynamite sticks. If the story hinges on the audience accurately identifying this particular

threat, then this may be a major weak point. Mamet would probably argue to explain the device's purpose in some other way.

Operator reacts to the perceived threat by jumping to action. He gets out of his chair, and looks to the side with determination. What does he have planned? The film answers this question in the sequence of the three subsequent shots. By grabbing a rifle, loading it, and putting on his hat, he is preparing to attack. The next shot finally establishes the spatial relationship of Operator to the tower: as he runs out of the opened doors, it is clear that he has been reading in the office perched on the tower's top.

Could the dynamite-looking object be replaced with something unidentifiable and have the story still hold together? Should it be, as Mamet might argue? Up to this point, the story has effectively explained Operator's ignorance of the climbers, so it would be entirely believable that the mere sight of the suited figure on the monitor is reason enough to put the book down and begin pursuit. It seems that, to this point, the object need not look immediately like a bomb.

Surprises

Operator rushes out to find… nothing. Looking a bit harder, he sees the bomb and a wire connecting it to something near his own feet. At this stage in the film, the audience is neither ahead nor behind the human character. This fact is heightened by a POV shot that follows the wire to its end, where the tiny figures stand, no bigger than Operator's shoes. This moment marks the collision of the film's two characters, and encompasses the film's first reversal: The climbers, who have been presented as a threat, are revealed to both the audience and Operator as being remarkably, unthreateningly small.

The other two approaches to presenting this same information are to have the audience ahead of Operator or behind him, respectively. The former choice is the signature of suspense films. For instance, in the end of *Silence of the Lambs* (1991), the audience knows what Clarice Starling doesn't: that the murderous Buffalo Bill is wearing night vision goggles while she fumbles around in the pitch dark. Her victory is made all the more sweet by the gut-wrenching angst that comes with seeing what she cannot, and the unbelievably skewed odds against her.

To be behind Operator at the moment of his discovery would entail the audience seeing his reaction to the discovery before making it themselves. Flik, in *A Bug's Life* (1998), surprisingly interrupts his own confident banter about his upcoming journey with a quivering "oh." The audience needs to wait for the next shot to discover what he has just discovered: the seemingly impassable cliff at the edge of Ant Island.

Being behind a character's discoveries gives and audience hints about how to interpret the discoveries themselves. The camera move and atmospheric perspective used in the *A Bug's Life* example present what might, to a human, be considered a beautiful vista. Flik's uncertainty makes us see it as a threat. Being ahead of a character gives the audience a chance to guess about the character's reaction to the event or knowledge they see coming. Both cases function by posing questions in the audience's heads. When behind, the question is, "What did he or she just figure out?" When ahead, the question is, "What is he or she going to do about this?" As either situation resolves, the questions get answered and the audience ends up knowing more about the character than before.

Being in sync with the character denies the audience both of those character-defining questions, in favor of a third choice: seeing through the character's eyes. With

this choice, the film positions the audience as the character, and for the duration of that one shot, at least, the audience and Operator are one. When the audience next sees Operator's face, it is something akin to looking in the mirror.

By this point in *Tower 37*, the audience has spent more screen time with the two climbers than with Operator. They have witnessed tastes of their relationship and their challenging ascent. Operator, on the other hand, has just been reading. The choice of putting the audience in his head at this moment of discovery shifts the focus of the film onto the his story. Operator's reaction of surprise, presented in the next shot, makes it clear that these little suited figures are just as mysterious to him as they are to us.

Does this mean the film finally has a protagonist, namely, a "main" character who offers a point of emotional entry to the audience? And if it is the human, then what about the climbers? The film doesn't answer those questions immediately, and the ramifications of that decision will play out later on. The next sequence of shots includes cameras at the human scale as well as at the climber's scale, giving equal weight to each group as the bomb is detonated (to no effect) and the suited figures scatter.

The human easily scoops up the smaller of the two figures (Leed), and, in shots that recall the film *King Kong* (1933 and 2005), brings Leed in for investigation. After some poking and prodding, Operator sets down his gun and tries removing Leed's helmet. Setting down the weapon is a clear signal that Operator no longer perceives the climbers to be a significant threat. When he succeeds in removing the helmet, the film offers up another reveal for both the audience and Operator: the suit is not your typical clothing, it is an inverted diving suit holding a fragile aquatic creature.

Operator's reaction to Leed's suffocation is instinctive and fast: he rushes back in to the office and drops the creature in his pitcher of water, reviving it. The audience and Operator have stopped wondering about what these tiny invaders *are*, for that has been made visibly obvious. The new question injected by the film is: why? Why was this tiny fish-creature wearing a suit, scaling the tower, and trying to blow it up?

Understanding

Tower 37 offers a break in the action to allow this question to percolate: a 20-second shot of Leed and Operator coming face-to-face at the pitcher's edge. When Leed's darts and dashes to escape prove futile, he demonstrates his sentience to everyone by staring down Operator and forcing him to answer the question for himself. Operator seems to do so, and the audience is left momentarily behind as he checks out his own theory. Yes, in fact, the fish-creature has come from the trace of dirty water remaining in the lakebed below the tower. And he is one of many.

Operator's reaction to this news is illustrated in Mamet-style shots: his jaw drops, his binoculars slip out of his hands, he sways as if off-balance, and he collapses into his chair. This sequence recalls T. S. Eliot's *objective correlative*, a term which represents the sum of things in a piece of art that contribute to a particular emotional response[5]. The intended reading here seems very clear from the assembled pieces: this news has quite literally knocked this human off his feet. He is shocked, stunned, and surprised.

The film provides another "break" at this moment, in the form of a 15-second shot that ends with Operator casting his hat to the floor. The new facts being considered are that the fish-creature who tried to blow up the tower is one of many, and the many are currently all crammed below the tower in the remains of the lake. The discarding of the

hat recalls the moment it was introduced into the film, namely, when Operator rushed out to defend the tower. The lack of dialogue keeps Operator from articulating, in words, what he has decided. But the face of resolve that he strikes, coupled with the metaphorically-loaded tossing of his hat (and with it, presumably, his job), tells the audience that he isn't the same character he was before.

A Call to Action

The audience is momentarily left behind Operator to find itself in sync with Leed in the pitcher. Though no point of view (POV) shots are used, we see Leed watching the human carefully and wonder along with him what Operator has decided to do. In a composition that recalls the first shot of the climbers ascending the tower, the discarded hat is placed in the foreground with Operator shown busy working the console in the background. Whatever he is doing over there, it is literally on a different visual plane than the hat and what it represents.

The answer is offered in the next series of shots that show the water stopping to flow in and out of the tower. When the panels open to drain the contents back into the lake, it is clear that Operator has decided to return the water to the fish-creatures.

The film may miss an opportunity here to show more clearly what the significance of these actions are to Leed in the pitcher. While he is definitely shown watching the whole process, the lack of anthropomorphic facial expressions doesn't provide a clear emotional read. Given time to reflect, of course, it's assumed that this is great news for Leed and his kind. After all, this is presumably what he wanted to do in the first place with that explosive at the top of the tower. But *Tower 37* does not provide this time to reflect, at least, not with the camera on the proper character. A long-duration

shot shows *Operator* finishing his work at the console and then relaxing. Though this time has its own value (to allow Leed to scoot out of the pitcher and to the door), some of it could have been spent on Leed's face, reminding and inviting the audience to see this sequence of events from that character's perspective.

A Tragic Turn

The human's moment to enjoy having done the right thing for the small fish-creatures[6] is immediately interrupted by the familiar sound of the automatic office door opening. The audience is back with Operator, and in another POV sees Leed sprinting out of the office towards certain suffocation. Operator gives chase (slipping on some water! Ah, it's the water, again, that seems to keep getting in between these characters), and the two end up seeing something just before the audience does. Something that, based on their animation, is shocking.

It is the gun, because really the staging here is meant to show the gun about as clearly as possible. It's Operator's forgotten gun pointed straight down at the top of the tower. And under the gun is the other suited figure (Mule), forgotten these last few minutes but still, presumably, focused on his original goal. That much is clear in how he struggles to keep the gun pointed down, and how he grasps a wire that's been coiled around the gun's trigger to fire it. As intelligent and resourceful as these creatures are, it seems they too can be ignorant. Just like Operator was until a few moments ago. Perhaps this very outcome is what Leed was trying to avoid by leaving the pitcher.

In a flash, Mule is gone, the tower is irreparably cracked, and *Tower 37* takes a sharp turn towards tragedy. Just when everyone seemed to figure each other out, the audience is reminded that not *everyone* was actually in the loop. To everyone's dismay.

As the glass shards begin falling, Leed finds himself back in the water, and once again comes face-to-face with Operator. But their situations have switched since their meeting at the pitcher, with Operator now on the tiny, life-sustaining craft. Leed vanishes deep into the body of the tower, and Operator is left adrift.

Take it Laying Down

The film shows Operator looking around, watching as things tumble into the water and disappear. The office is the last visible thing to go. After seeing that, the panic starts leaving Operator's face and he begins focusing on other things. A glance takes his eyes up to the sky, where the sun moves from behind a cloud formation. His attention is clearly off the chaos around him, and he responds to these new sights by visibly relaxing, softening, and ultimately lying face down on his floating platform. He stares at the camera for a moment before closing his eyes completely. The final shot of Operator shows him prone, almost resting. He is isolated in a world of water, drifting slowly towards the edge of the frame.

Up to this point in *Tower 37*, Operator has been defined by the choices he has made in response to new visual information. When he sees the perceived attackers, he rushes out armed. When he sees Leed suffocating, he saves its life. When he sees the masses of fish-creatures in the nasty water, he chooses to drain the tower for their benefit. Finally, he sees the office sink. This somehow causes him to take notice of the sun behind a cloud, which ultimately leads him to close his eyes and accept his fate gracefully.

This sequence of shots, their timing, and the steady reduction in the camera tumble due to turbulent water all build towards a climax. But the narrative elements at play regarding the human character don't particularly gel. Why does seeing his office

sink cause him to look differently at his surroundings? What draws his attention to the sun, and why does seeing it offer up comfort enough to let him relax before what will certainly be an unpleasant finish? The film does not currently answer these questions effectively enough, and they tend to distract from the emotional weight of the moment rather than support it. The film itself may provide suggestions for how to better handle this moment: if the model from earlier were followed, the human character would see the office sink, be given ample time to ponder this, and then make his choice. His being distracted by "nature shots" doesn't even seem necessary.

How should he receive his final moments? He could hunker down, grab the edge of the platform, and try to ride out the collapse. Or, in the other extreme, he could go limp and not pay attention to it. He chooses the latter, and in doing so recalls the character we met at the beginning, the one who chose to bury himself in a good book rather than be present at work. In this sense he remains the character we met at the beginning, albeit one who has taken a significant journey since then.

Resolution

The final minute of *Tower 37* presents the collapse of the tower, in a fashion reminiscent of the destruction of Parliament in *V for Vendetta* (2005). In that film, the same explosion was shot multiple times with different cameras, running at different speeds. Similarly, the plan for *Tower 37* is to simulate the entire tower collapse, then choose camera angles to present the destruction in a way that builds towards the final full-shot of the whole tower coming down.

After the collapse, the narrative returns to Leed, who ascends to see his brethren enjoying the return of the lake water. But the surfacing of the now-empty platform and a

close hold on Leed's expressionless face recall the tragic events of the rest of the film. The closing shot shows the replenished lake as a tiny highlight in the much broader desert.

This is a clear conclusion to the overall narrative. The suited figures ultimately got what they wanted, but at a very large price. And though the film ends tragically, it is not without hope: the survival of Leed, and all he has learned during the events of the film, keep alive the possibility that the same events that befell Tower 37 may be avoidable at whatever other towers there may be.

Notes

[1] Words or phrases that appear in **bold** are defined in the Glossary (Appendix A).

[2] "Info & Tidbits on Three Kings." Rotten Tomatoes. 10 Apr. 2007 <http://www.rottentomatoes.com/m/three_kings/about.php>.

[3] I personally believe that applying the real-world qualities of image degradation and camera limitation isn't a process that succeeds when done only part way. To wit, when synthetic lens flares began appearing in otherwise pristine computer animated films, they had the opposite effect that is being strived for here: by calling attention to themselves, these effects pulled many viewers out of the viewing experience.

[4] Kaplow even goes further, using the technique twice in back-to-back shots. The film reveals itself to be just a simulation too, via a quick pulse of video noise that appears just before the credits.

[5] T. S. Eliot, as quoted in J. A. Cuddon's Dictionary of Literary Terms.

[6] Another improvement here would be to push his face more into a smile after he exhales. The human has emerged, momentarily, victorious. It should be shown more clearly that way.

CHAPTER 3

COLLABORATIVE PRODUCTION IN THE CLASSROOM

Introduction

This chapter describes the collaborative animation classes which have served as the principal production units on *Tower 37*. Although it is intended for computer animation instructors at the college level, aspects of the chapter will be useful for any educators who seek to create collaborative classroom experiences.

Motivation

A "traditional" curriculum in computer animation consists of individualized study in the various sub-areas of animation: modeling, shading, character animation, and lighting. Generally, students demonstrate their understanding and growing proficiency in these areas through small projects and exercises. At some point, students are asked to combine everything they've learned and produce an entire short film on their own, often as the capstone project of their undergraduate education.

In my experience, this approach to teaching generates a large number of disgruntled students. Very few students are strong enough generalists that they can model, shade, animate, and light all the pieces of a film project to a level that they find themselves satisfied with.

Where does this sense of satisfaction come from? What metric are they using to measure their own success? The reason many of these students choose to take animation classes is because they have been awestruck by visuals they have encountered in their non-academic lives. This includes work for feature film visual effects, feature animation, computer game cinematics, and music videos. The vast majority of computer animation

these students see is produced by groups of well-funded industry professionals with the latest tools and adequate production time. The modern production pipeline that produces this work consists of specialists in the aforementioned sub-areas, working largely in an assembly-line fashion to maximize throughput.

In other words, the industry that inspired many of these students to study the field, the industry work they are trying to emulate, and the industry that many of them are destined to enter runs exactly opposite of how they are taught computer animation in school. The work they produce under this traditional model rarely looks like the work of their dreams, and as a result many come to the conclusion after four years of study that they should pursue another career upon graduation.

Animation, like live-action film and video, is very often a highly collaborative enterprise. Undergraduate film and video programs generally encourage and support (some even require) collaboration from the very first classes a student takes. Yet, to the detriment of the students, animation programs have been slow to embrace these same values.

The computer animation curriculum that I have created at Hampshire is an attempt to address these concerns. A two-course sequence, *Computer Animation I* and *II*, is offered regularly. These classes follow the traditional, individualized, generalist production study model. They introduce each of the sub-areas and help students learn the language, the theories, and the basic practices that underlie computer animation.

Students who complete the sequence and want to continue learning about animation production can enroll in a new type of *collaborative production* class, as detailed below. These group-based studies attempt to complement the first two terms by

requiring students to specialize instead of generalize, and to collaborate instead of work independently. The benefits of these classes are significant:

- By their nature, these classes build community amongst the students.
- They are modeled after industry-standard production practices, which not only keeps the computer animation students current in their understanding of the field, but it unites them with musicians, sound engineers, editors, computer programmers, designers, painters, and other participants in a truly interdisciplinary endeavor.
- They offer students the opportunity to dive deep into their area of interest with a substantial support structure around them. For instance, a student interested in modeling character geometries can focus on that, leaving the work of designing and animating the character to his or her peers who are more interested in those challenges.
- They generate publicly-viewable animated films that are more complex and polished than a single student could complete in the same amount of time. With festival attention, the films become demo reel and resume material for both the students and the instructor, and they can also act as marketing materials for a school's animation program.
- They introduce students to the entire production cycle, including the importance of meeting deadlines and the value of adhering to protocols. This information, which often doesn't come up in the generalist courses, is tremendously relevant during a student's capstone thesis project.
- They can generate a substantial amount of production tools, scripts, and other technological infrastructure which supports all animation projects within the school (and beyond).

The collaborative production classes also pose substantial challenges:

- Since each student's trajectory through the course is unique, these classes are more challenging for instructors than traditional classes in terms of managing assignments and student evaluation/grading.
- All forward progress on a film project is dependent on the approval of completed production tasks by an appropriately deputized individual (or individuals). These people must take great care to both keep the project moving forward and permit creative contributions from the team, or else the project can stagnate and take student interest with it.

- It is critical that the project itself is both appealing to the students in the class and within their ability to produce, therefore, project selection must be undertaken with a solid understanding of the production process and of student backgrounds.

Related Work

In recent years, a number of authors have reported on the positive results that have come from collaborative, interdisciplinary computer animation courses regardless of whether they are taught to beginning or experienced students (Ebert, Perry, Duesing, Orr, Lewis). A growing number of academic programs are offering collaborative animation classes[1] and the growing number of exceptional student animations produced collaboratively is an argument in itself that the approach yields quality work[2].

Both Ebert and Duesing report on forming small groups of 4-6 experienced students to produce student-proposed animations with substantial technical components. This latter requirement highlights the importance of both art and technology in the work, which keeps the contributions of the students balanced across the disciplines. These group projects appear to be directed democratically by the students themselves (though Duesing reports that a democratic project selection process tends to favor projects full of stereotypes or "low-brow" humor). A different approach pits a whole class of students on a project that originates from outside of the classroom, sometimes even from beyond the academy (Hogarth, Lewis). These classes introduce the idea of outside directors (clients) that, ultimately, have to be satisfied for the work to be considered complete.

Team or co-teaching across disciplines is common amongst these courses (Ebert, Duesing, Orr, Lewis). It permits faculty-guided instruction in a wider range of areas, which becomes increasingly important for classes that attract students with little experience.

Evaluating student contributions in collaborative classes can be challenging. Both Ebert and LeJeune discuss the use of end-of-term assessment instruments (by both students and faculty) to more clearly identify individual student contributions. LeJeune in particular emphasizes the importance of explicitly defining the learning objectives in a course so that assessment can be done against a particular, clearly-defined rubric.

Instructors of collaborative production courses also emphasize the difficulty of teaching teamwork and communication skills (Ebert, Orr), yet they identify the importance of these skills to the overall success of the projects.

The following section introduces an approach to running a new form of collaborative production class that addresses these challenges presented in the literature while also generating quality animated content. It is followed by descriptions of three example collaborative classes taught between 2002 and 2007.

Approach

The approach to collaborative production presented here accommodates 15-25 students per class. These students all work on a single animation project with the instructor of the course acting as the writer and director of the film. The limited range in class size is an attempt to balance the need for a large variety of different skills (this can range from art to computer science) with the difficulty in managing assignments and in-class review time: Too few students and the team may lack skills in a critical area; too many and the production gets bogged down by the mechanics of managing tasks.

Pre-Class Planning

Attracting a team of students with an appropriate distribution of talents across the various sub-areas of production is required for running a successful collaborative course.

"Appropriate" is completely determined by the project itself: for example, a film with no character animation will not require character animators, and a film that is envisioned as looking photorealistic will likely need substantial shading and lighting talent.

Not every student in the course needs to be a "production" student. That is, not every student's efforts need to be focused on the craft of producing work for the final piece. Depending on the needs of the project, it can be helpful to have students in production-supporting areas such as information technology (IT) or core computer science. The examples below will highlight some of the benefits that come from including non-production students on the class roster.

The strong relationship between the project and the talents of the enrolled students argues that the instructor/director have a reasonable understanding of the project early on. The earlier the better, in fact: if the director can specify the number of characters, duration, visual style, or other aspects of the project early enough, then he or she can tailor the course description to better attract the right students. At the same time, if too much development occurs before the class begins, there is a risk that the students will feel that their creative contributions are limited. Not only will this lower morale, it may also weaken the project.

The director should also determine as early as possible whether the project is a single-semester project or a multi-semester one. Single-term projects require skilled students across the entire production process, and they also have a built-in goal, deliverable by the end of term: the final film. Multi-term projects may require different skills depending on which phases of production will be completed during the term. Also,

an instructor will likely have to invent an appropriate end-of-term goal for a multi-term class (see examples below).

Adequate prior knowledge about the film, its production duration, and the necessary crew should simplify the drafting a course description that calls out across departmental boundaries, such as this taken from one of the example classes:

> In this course, advanced students will form one team and produce an animated short film with the tools of three-dimensional computer graphics (CG). The class will take the film all the way from story pitches through scripting, storyboarding, character and set design, voice recording, scoring, modeling, layout, shading, animation, lighting, and rendering. Students will be required to specialize in one or more of these areas and must demonstrate their experience and ability in their area(s) of interest to gain admittance to the course. In addition to students with CG production experience, the course also requires students to serve in one or more of the roles of screenwriter, drawer/designer, painter, sculptor, producer, sound engineer, web programmer, asset manager, and general technology expert. Interested students should bring a portfolio of relevant work to the first class.

But even the most inviting description won't help if it is buried in unexplored regions of the course catalog. For example, Art students may not be accustomed to browsing the Computer Science section as they search for classes. To maximize visibility, the instructor should tap other venues of advertisement such as posters and targeted emails to faculty colleagues in other departments. Cross-listing the course may also be an appropriate choice.

It is imperative that the course listing explains to prospective students how enrollment decisions will be made. The example courses detailed below all used a portfolio-based application process which required students to bring a demo reel and/or resume to the first class meeting. It is likely the instructor will have worked with many of the prospective students before, however, the reel is still a valuable step in the process:

not only does it give students practice compiling their work, but it is a way to inform the teacher of other work a student may be doing outside their shared class experiences.

Requiring a reel also helps identify students who may not be prepared for the rigor of handing in work with very strict deadlines. The interdependence of production tasks throughout the show necessitates that students respect deadlines as much as possible. If hitting a well-advertised first-day-of-class target is too hard for a given student, then perhaps that student shouldn't be a part of the course.

The First Class

If the course was well-advertised, the first class meeting will hopefully be full of experienced students from many different fields, each with a portfolio or resume in-hand. Any animation students present will certainly know something about how animated films are made, but others may have no idea. Even the animation students may have learned what they know in different classes, so it is a good opportunity to educate everyone about the production pipeline, using a consistent set of terms (

Table 1).

After the roles are presented and discussed, it is valuable to offer students the chance to articulate their choices: Some students may have come to the room curious about one role, but in hearing about them all may have changed their minds. The example courses employed a short questionnaire which, among other things, asked students to identify the roles they would like to play on the production and why. This information is invaluable when making enrollment decisions.

In two of the three example classes taught, the author chose not to discuss the specifics of the semester's film project during the first class. Students were certainly

curious, but the details were withheld until enrollment decisions were made. This ensured that all conversations about the story took place with students who were going to be working on it.

ROLE NAME	Description
Animator	Creates all motion in the film other than the camera and the effects. Generally focused on producing character performances
Composer/Sound Engineer	Writes, records, and/or collects music or audio for the film.
Concept Artist/Designer	Determines the visual form of everything in the film using whatever medium is most appropriate (drawing, painting, sculpting, etc)
Director	Has overall creative oversight over the production
Editor	Assembles all moving cuts of the film, from the story reel (animatic) through the final edit
Effects Artist	Creates the necessary geometries, motions, and shaders for creating visual effects such as water, fire, and smoke.
IT/Technical Support	Responsible for the computational infrastructure of the show including backups, machine configuration, software and network maintenance, production tool development, and more.
Layout Artist	Translates storyboards into 3D layouts, which includes camera selection, shot timing, and other composition-related factors
Lighter	Light individual shots and escort the shots through the rendering process.
Modeler	Builds the geometric forms of 3D objects. This may also include any UV coordinates used for shading.
Painter	Paints 2D backdrops, surface textures/maps, mattes, and paint fixes on final frames
Producer	Tries to ensure that the best film gets produced on time and on budget.
Rigger	Prepares a geometric model for animation.
Shader Writer	Creates reflectance properties of all surfaces, perhaps painting texture maps as well
Story Artist	Translates the written story into visual form, typically by drawing sequences of storyboards
Writer	Responsible for dialogue, plot, and story

Table 1: A list of the most common production roles used in the three example collaborative production classes.

Enrollment and Trajectories

Enrollment decisions should made based on each student's interests and his or her demonstrated abilities, balanced with the demands of the production. In each of the three versions of the course taught by the author, most prospective students indicated interest in (and demonstrated ability in) multiple areas. Perhaps surprisingly, this simplified—rather than complicated—the process of assigning students to production roles.

The needs of any production change over time. At the beginning of a project, for instance, there may be a need for storyboarding talents, but those story artists won't be necessary for the duration of the film. It is generally easier, therefore, to accommodate a talented 2D artist in the class who is willing and interested in not only storyboarding but also design, painting, and/or other roles that may utilize similar talents later in the production process. This introduces the idea of student "trajectories."

Each student admitted to the class is given a trajectory that lays out the chronology of roles they will likely play on the production. Some students may wear many different hats, others only one. It should be expected that some roles will be populated with many students while others are not. For example, in a character-driven film, there will likely be a need for many animators, but perhaps only one producer. Some roles also may exist throughout the production while others come and go (see Table 2).

Announcing the trajectories to the students at the second class meeting is an exciting experience. The students who have been selected to the class generally return very eager to learn about both the project and the roles they will be playing on it. Historically, it has been possible to accommodate every student's major interests while

also meeting the needs of the film. If this is impossible, then the time between the first and second class meeting should also be used to revise the project to fit the crew!

DESCRIPTION OF STUDENT	POSSIBLE TRAJECTORY
Experienced studio artist, limited 3D production experience	STORY ART -> Layout -> Lighting
Experienced 3D artist with some painting experience. Expressed interest in animating but was willing to model as well.	Concept Art -> Modeling -> ANIMATION
Computer Science student with substantial 3D experience, expressed equal interest in modeling and technical support	Modeling -> Technical Support
Traditional film student, no CG experience but capable musician and filmmaker.	EDITORIAL/SOUND
Studio art student, no 3D experience.	STORY ART -> Texture Paint -> Paint Fix
Film student, no animation experience. Interested in production management.	PRODUCER

Table 2: Some example trajectories, based on hypothetical areas of student interest and ability. All caps denotes a student's "primary" role, namely, the role that student will occupy for the majority of the production.

In addition to announcing the trajectories, the second class should be used to pitch the project to the students if that hasn't been done earlier. This will prompt a discussion about the project as a whole, from the story to its message, the obvious challenges, and so on. The director should be prepared for this discussion, not only to defend the creative choices he or she made but to welcome the contributions of the newly-selected crew. Because from this point on, the film is in many hands.

Becoming The Director

There are as many different styles of directing as there are directors. It is important that an instructor planning to act as director on one of these collaborative class

projects devise an approach that maximizes student participation, learning, productivity, and enjoyment while simultaneously preserving the coherence of the film[3].

In all three example classes, the students were arranged into a flat hierarchical structure with the director being the only person qualified to approve or not approve work. This structure has many benefits, starting with the assurance that student contributions are never approved or rejected by another student. This does more than simply avoid student-to-student conflict: When students have to present work directly to the director, they know they must be prepared to defend their choices within the context of the larger film. This requires that each student understand the project (and their role on it) fully, and in that sense it cultivates them as true collaborators.

For this arrangement to work, however, the director must be prepared to listen and consider these contributions from his or her crew. Everyone, including the director, needs to remain aware that the project being undertaken would fail if it weren't for the participation of all involved. It would not be a collaborative project if the students simply act as executors of the director's vision.

Coherence can be maintained if the director focuses his or her attention on one critical element: the story. By acting as the protector of the story, the director can argue for or against particular contributions without alienating the crew. For example, any number of character designs could serve as a film's main character, but which makes the most sense *given the needs of the story*? By critiquing work with arguments based on the story, the director will keep critical content decisions separate from preference- or taste-base choices.

For example, imagine a shot in a hypothetical movie that shows the main character dropping something important. The shot gets storyboarded and is in the process of 3D layout. The crew member shows the work-in-progress to the director, and it although it matches the board it doesn't work as expected in 3D. The director has many choices at this stage. If he or she has a specific change in mind that will make it work, then the time should be taken during critique to not only describe the change but explain why. Perhaps the shot is referencing a scene from another movie that worked really well to capture a particular feeling, etc. This moment will transform into a learning moment for the student and a clarifying moment for the director.

If, on the other hand, the director just recommends the change but doesn't say why, then the student is discouraged from being engaged in the process. They not only feel bad about the work they did, but they go ahead to make a change without necessarily knowing why.

An equally, if not more likely scenario, is the one in which the shot doesn't quite feel right in 3D but the director can't quite say why. These are the best opportunities to fall back on the story and open up the problem for discussion. What does the story argue this moment has to be about? What can be done with the camera to help support those points from the story? This encourages everyone in the area to step out of what they're doing and think about the bigger film being produced. Many ideas can be generated this way, with hopefully at least one of them being a more suitable choice for the particular scene. When the director hears (or comes up with) the one that's the best fit, he or she once again should explain why.

The film, ultimately, is built up piece-by-piece from the work presented in review. If every member of the crew—including the director—makes choices throughout the process with the story's needs in mind, then these component parts will connect into a coherent whole.

Assignments and the Quest for "Final"

After announcing the trajectories and discussing the film in the second class meeting, the classroom stops looking anything like a traditional class and instead transforms into a studio. The film is broken down into a sequence of production tasks that must be completed, and these tasks are assigned to the crew based on their trajectories.

Just about every future moment in the classroom is spent in review, and review time is driven by the crew's quest for "finals." A "final" is verbal approval from the director that the given task, as presented in review, is considered complete. The member of the crew who receives the final hands off his or her work appropriately, and then is given the next task. If this cycle is repeated enough times, the film will get finished.

Note that review can and should happen beyond the classroom. Students work at different times and different rates; it is possible that a student will have review-ready work many days before the next scheduled class meeting. The production can move forward more quickly if that student's work gets seen as soon as possible. Although there's no real substitute for face-to-face review, many existing technologies can be used to provide adequate feedback remotely: telephones, instant messages, browser-based video, and the like have all been used in the courses described below. Two pieces of custom software were actually developed by students within the context of these classes to facilitate work tracking and review. These are discussed below in more detail.

Managing student assignments (i.e., breaking down the film into assignable chunks and distributing them to the crew) is the most arduous task involved in teaching this type of course. The tasks themselves are, obviously, driven by the demands of the film, and they must follow a certain causal order for the production to flow smoothly: for instance, a character must be designed before it is modeled, and modeled before it is articulated, etc. To complete these tasks efficiently and successfully, they need to be assigned to the student that is best qualified (and most interested) in doing that particular kind of work. But that is not always possible, particularly if the crew is weak in one or more areas of production.

The Producer

It is the job of the *producer* to help manage these complexities. The producer exists to track and facilitate the production, and it is the producer's responsibility to understand all current and upcoming tasks so as to properly allocate resources to them. Because of the tight connection between the production and, ultimately, a student's academic record, the role of the producer must be cast with care. The producer's role is, in many ways, like that of a very involved Teaching Assistant.

The producer and director should meet regularly outside of the scheduled class times to review the current slate of assignments and prepare the next round of tasks. If students are instructed to contact the producer when they have work ready for review (highly recommended), then this one-on-one meeting time is also valuable for determining how much time will be spent on each of the requested reviews in the next class meeting. The producer must therefore be able to understand and establish the *priorities* of the production if they are to succeed in the role.

An effective producer will be comfortable juggling lots of data (spreadsheet skills are certainly a plus), taking good notes during review, and interacting with all the members of the class. While it is also beneficial for the producer to be familiar with the animation pipeline, it is not completely necessary: immersion in the class will provide a crash course in the language and the causal relationships of animation production.

Disciplinary Action and Problem Solving

Class meetings run smoothly when a prepared director and producer are greeted by a crew that has work ready to show. If things are scheduled well then the director can make all the rounds, look at all the work, engage the crew in critiques, and perhaps even final a few assignments.

Of course, things don't always go smoothly. The most common forms of schedule disruptions come when a crew member doesn't show up, doesn't have the work ready that was supposed to be ready, or does have the work but has taken it in the wrong direction since the last review.

At these times it is good to remember that this is a class, and that the same incentive schemes at play in the usual classroom generally apply: namely, grades. The instructor should establish clear evaluation criteria at the start of class and fall back on these criteria when necessary. In the courses taught by the author, these criteria included attendance, promptness, willingness to cooperate/collaborate, participation in critiques, and the overall "professionalism" of a student's work (i.e. preparedness, adherence to protocols, ability to complete work, and the like). It doesn't hurt to remind the crew that, if this were the industry, lateness and incomplete work might very well be met by termination of employment.

The instance involving a student taking work in the wrong direction is slightly more complicated. This happens with some regularity, particularly with crew members who aren't accustomed to showing incomplete work. They can get caught up with the intricacies of the problem they're working on only to emerge later with something that is polished, but which doesn't fit the broader project. This ends up hurting the project in two ways. First, the student ends up feeling shamed for having done something "wrong," and second, the work has to be re-done, which translates into lost time.

One thing that helps eliminate these problems is to establish a culture centered around review from the earliest classes. Encourage everyone to show their work as frequently as possible, perhaps at every class meeting. Not only will this train everyone how to look at in-progress work (a challenge in and of itself), but it will reinforce the fact that everyone is working together to reach a common goal. More critiques generate more new ideas, and this allows the best ideas to become part of the film.

The "perfectionist" will have a hard time with this system, and may need to be required to show work on a regular schedule. On the good side, perfectionists put everything into their work. The trouble comes when their vision isn't perfectly aligned with the director's view of the film. Frequent review will allow for both parties to be certain about what's best for the project, and will keep these critical contributors on board.

The End of Term

Ultimately the semester comes to an end and students need to be evaluated for their efforts. Because of the unique trajectory each student will have taken through the course, grading becomes a non-trivial affair. Accurate records are necessary so that

student contributions can be counted and assessed. Another tool that has historically proven useful is the student journal.

In each of the three collaborative production courses taught by the author, students were required to keep regular weekly (or bi-weekly) journals. These began as emailed documents but evolved into blogs (web logs) in later classes. If the journal entries are required too frequently they will be done hastily; too infrequently and critical details may be omitted.

Offer clear guidelines for writing the journal entries, because students seem to respond better to questions and suggestions than to a blank page. For instance, ask about the class meeting time, about each student's assignment progress, their immediate working groups, etc. Make it an opportunity for each student to communicate directly with the director/instructor, because there generally isn't time for such during the heavily-scheduled class meetings. This is easier to do when the entries are kept private (email) than when posted to a public blog.

The journals become invaluable repositories of information about each student's work in the course including their challenges, their collaborators, and their successes. Students may use the journals to inquire about potential trajectory changes, or about larger story- or class-related issues as well.

A final important consideration about the end of term is the film's credit list. For single-term projects, the credits will be fairly straightforward. In the case of a multi-term endeavor, however, accurate records are necessary to ensure that students from early classes are appropriately credited for their contributions on the project.

Infrastructure

The above sections detailed the operations of a collaborative production course from the perspective of the instructor and/or director without much discussion of the technical infrastructure required to support such a class. Computer animation is very machine-intensive, requiring sophisticated software that is properly configured, adequate disk space, maintenance, networks with high bandwidth, and so on. Those technologies require adequate support personnel and funding.

Some course-specific needs that may surpass those of a typical animation lab include a dedicated file server, a **revision control system**, and a reliable backup system. Courses of this nature will generate valuable assets at a high pace, and individual students can't be expected to keep track of these assets when they are frequently being passed from one crew member to the next. At the very least a centralized repository for assets needs to be established, backed-up, and kept running properly.

Students can certainly be put in charge of these technologies if they are qualified. In fact, two substantial production-supporting technologies were generated by students during the author's recent collaborative courses (see details below).

Examples

A total of three single-term collaborative production courses were taught by the author: one in the fall of 2002, one in the fall of 2005, and one during January of 2007. All three classes ultimately followed the model described above, with any differences highlighted in the following discussion. They were all taught at Hampshire College in Amherst, Massachusetts.

The first class tackled a single-term project entitled *Displacement*, and the following two classes have worked on the multi-term film *Tower 37*. The latter project is still in production, and will be the subject of a fourth collaborative course slated for the fall semester of 2007. Enrollment and duration data for each course is found in Table 3.

Term	Project	Enrollment	Meeting time per class	Meetings per week	Duration
Fall 2002	Displacement	16	1.3 hours	2	12 weeks
Fall 2005	Tower 37	20 (26*)	1.3 hours	2	12 weeks
January 2007	Tower 37	12 (15*)	7 hours	5	2.8 weeks

Table 3: Enrollment and meeting data for the three collaborative production courses taught by the author. The * indicates the total number of participants, including non-students (alumni and staff).

Displacement (Fall 2002)

The original *Displacement* class produced a 3.5 minute, high-resolution[4] short film within a single term. Pre-class planning included the writing of a one-page treatment, which was purposefully limited to two very similar characters, no dialogue, and two environments to help ensure its timely completion. The treatment also contained few visual references so that the majority of visual development would be in the hands of the students. There was a single producer in the course who had no animation experience but substantial film production experience. The class use the software packages Lightwave (for 3D), After Effects (for 2D compositing), and Photoshop (for painting).

The *Displacement* class was successful by a number of measures. The film itself was finished, printed to 35mm, and screened at multiple film festivals[5]. It was also

nominated for the Budweiser Discovery Award on the online film festival site TriggerStreet.com. The students who took the class rated it highly in Hampshire's required end-of-term course evaluation forms. Certain key measures from these forms have been collated into Table 4 to provide a summary of the students' experience.

Term (# raters)	Overall, I rate this an excellent course	Overall, I learned a great deal in this course	As a result of taking this course, I have a new or increased interest in this subject	I put considerable effort into this course
Fall 2002 (13)	4.92	4.92	4.92	5.00
Fall 2005 (16)	4.90	4.70	4.80	4.90
Jan 2007 (10)	4.70	4.80	4.70	4.80

Table 4: Excerpted data about the three collaborative production classes from Hampshire's standard course evaluation forms. Students rated each statement with a number ranging from 1 ("strongly disagree") to 5 ("strongly agree").

The forms also provide an open response area where students are asked to, "comment on what you did and did not get out of the course, given your expectations for the course." Many of these comments raved about how enjoyable, informative, and rewarding the course was; others offered up generally minor critiques. The latter included: "Course was everything I expected, though a huge time drain. Could have easily been stretched over 2 semesters. Leaves me very prepared for my Div 3 project [the capstone experience at Hampshire], if a bit short on time."

The class had been purposefully scheduled in the fall in order to encourage participation by students in their last year (in the spring, those same students generally don't take classes in order to engage fully with their thesis projects). This last comment came up in both of the fall-taught classes, which argues that expectations for student work may not have been drawn clearly enough at the outset.

Tower 37, Class 1 (Fall 2005)

The author's desire to tackle a longer and more technically challenging film led to the shift from a single-term project to a multi-term project in the subsequent two courses. Pre-class planning was much more substantial: it included the writing of a full script and the creation of a complete, ten-minute animatic prior to the first class meeting in the fall of 2005. Though this eliminated the role of story artist from the class roster, the more complicated film generated plenty of design and concept art work for students who would have otherwise been storyboarding.

Three changes in enrollment strategy led to the big jump in enrollment between the *Displacement* class and the first *Tower 37* class (see Table 3). For one, alumni and staff were invited to participate, and in fact three of the six alumni participants had taken the *Displacement* class three years earlier. The presence of these older and more experienced members elevated the level of the entire production: their voluntary participation signaled a seriousness beyond that of a typical "class project," the quality of their work set a high bar that the rest of the crew strived to reach, and they shared the best practices they had gleaned from their own industry experience.

The second enrollment change was the inclusion of new support roles, including two "pure" computer science students brought on to develop software, and a self-proclaimed "journalist" who was brought on to observe and reflect on the course as an experimental learning opportunity.

The computer science students created two tremendously important tools for the production. The first is a web-based production management system dubbed AniManage. Given the large number of participants working from off-campus (including the director),

the constant stream of work being completed at all hours, and the tangle of assignments being handed from one crew member to another, a browser-based system of this nature was invaluable. At its simplest, AniManage provides a chronological blog-like page for every assignment on the show. Updates can be posted to an assignment page by anyone in the crew, and can be in the form of text comments, images, movie files, or any other digital asset. All crew members that have been associated with the assignment (by the producer and/or director) receive an email when an update is made[6].

The other system is a Mac-based review tool called QtSketch. QtSketch is an application that plays digital QuickTime movies, but with an important extra feature: users can sketch on top of the movie. This makes it incredibly useful during reviews, particularly those reviews that are conducted offline (perhaps via AniManage) when in-person gesticulation isn't a possibility. QtSketch was inspired by and modeled after Pixar's in-house "Review Sketch Tool," which was employed heavily by Brad Bird on *The Incredibles*[7]. Both tools are undergoing active support and development and are slated to be released as **open source** software projects in the near future.

The final enrollment change in the fall 2005 course was the inclusion of two producers. The greater demands of the show and the larger crew (compared to *Displacement*) anticipated even greater challenges managing assignments. However, this didn't turn out to be the case, possibly because many of the new crew members weren't directly involved in production. It was helpful during class meetings to have one producer entirely dedicated to taking review notes, but it's not clear that the benefits outweighed the difficulty of having two—instead of one—centralized locations for all information concerning the production.

The fall 2005 class produced a teaser trailer for *Tower 37* as a final project. This helped rally the crew around a common goal for the final weeks of the term, but much of the work for the trailer was subsequently thrown away because it didn't fit into the actual film. In hindsight, an end-of-term goal more like that used in the subsequent course would have probably been better for the project in the long run.

The overall positive reviews again appeared in the students' written end-of-term evaluations for this class. In the interest of ferreting out problems, some of the critiques included: "There were a lot of times where I didn't like what I was doing, but I would do it all again. This has been a great class and might be my favorite one yet." And "[I] often found the structure for schedule class time somewhat un-ideal as it led to a lot of wasted time for some students."

The author's assumption about the first comment is that it was related to an understaffing in one particular sub-area (rigging, see Table 1). There simply weren't enough capable students in that area to allow for a broad distribution of the work, and thus one or two people carried the entire show's rigging needs on their shoulders. The second comment was likely due to requiring attendance by everyone, even those who weren't scheduled to show work. For the production-supporting roles in particular, this attendance requirement should be reconsidered. Alternatively, a longer class meeting would allow those students not showing work to use class time as individual working time. This, in fact, became one of the cornerstones of the subsequent course.

Tower 37, Class 2 (January 2007)

In his end-of-term findings from the fall of 2005, the journalism student mentioned above reported that Hampshire's intensive January term structure seemed the

most suitable for this kind of class. January term exists to provide a venue for intensive or experimental courses that don't perfectly fit the regular semester schedule for one reason or another. Enrolling in a January class is optional, though when a student does register for a January term class, they are only allowed to register for one.

Typically, fewer students are on campus during January as many choose to stay home. But the risk of a smaller crew was offset by the promise of having a more regular studio-like setting in which to work on the film.

There were two slated goals for the January term class: first, to finish all character animation on *Tower 37*, and second, to take all completed shots through a multi-stage render preparation process dubbed "blessing." Pre-class planning in the fall revolved around establishing the blessing process and the necessary computer programs to facilitate it. Planning also included the preparation of a reel to screen during the first class incorporating the contributions made in 2006.

The intensive January schedule (see Table 3) was tremendously successful. The constant co-location of the entire crew in one room made communication trivial, which meant that reviews could happen at any time, and that any number of crew members could be instantly brought together to solve a problem face-to-face. Also, since students were not expected to do class work outside of classroom time (9am-12pm, 1pm-5pm), they came to class refreshed and ready to meet the day's challenges. It also helped that there weren't the other demands of a full-time course schedule to consider, so students didn't have to choose to spend their time on one class over another.

One student, who had clearly also taken the fall 2005 course, commented in detail on the differences between the two structures. It is clear from his or her remarks that the ideal schedule remains to be found:

> "The format of this course compared to the last was both an improvement but also frustrating. I liked being able to devote all of my time to this one project instead of having to split my attention between many classes. But at the same time, a month just wasn't long enough to accomplish the goals that we had set in the beginning. Just as I felt that I was really getting into the swing of the class, it ended. I'm not sure which is better, to have this as a Janterm class or regular class because both have their benefits. It is true that I feel I was much more productive this time around, I just wish there was a way to make this intensive class run for a longer time."

The dual goals of the January term class (character animation and blessing) necessitated dividing the class into two teams. At least one student felt that the division, coupled with the short schedule mentioned in the previous comment, prevented them from getting exposed to more material: "I think it would have been nice to learn more about what other people were doing."

Evaluation

The collaborative production classes have proven to be remarkable environments for both my own and my student's learning to occur. This is in many ways not surprising at all: the classes are built around the idea of emulating a collaborative production studio and everyone involved is committed to one or more specific areas of production. Therefore, simply by how they are designed the classes provide high-level, specialist challenges to people ready to confront them. Area-specific learning seems inevitable given suitable interest on the part of the participants, and a side-effect of that interest comes a substantial amount of learning about collaboration and communication.

But the classes have had other impacts on campus that, to my mind, mark them as being far richer than just "learning opportunities." In particular, since beginning these kinds of courses I have witnessed changes in *who* is producing animation on campus, *how* they are doing it, and *what* they are making.

Who

The students who used to show up at my door interested in working with me were the students who wanted to emulate the work of either feature film animation studios or visual effects studios. While there remains a steady stream of these students, a broader range of students now comes to me excited about animation having either participated in, or heard about, the collaborative classes. Primarily, these students come from the studio arts or the traditional film/video program.

In some senses this is not surprising at all. The classes are fun, exciting, and generate work that the participants feel good about. It is easy to imagine coming in to a collaborative class from a non-animation background, enjoying the creative process, and wanting to continue following it after class ends. What I do find somewhat surprising is that these students aren't looking to produce computer animation. Instead, they come interested in producing hand-drawn films, experimental animation, and often work that isn't even time-based, such as graphic novels.

Students seem to be mapping the story-driven visual construction of a computer animated film that they witness in class onto other domains. In other words, they are learning a process that guarantees at least some form of storytelling success regardless of medium: to wit, even an inexperienced draughtsman could tell a story in, say, a graphic novel format if they followed the same steps they learned in the animation class. I believe

that many students, in art, film, and animation in particular, are seeking to tell stories with their work. The class, it seems, gives them more confidence in trying to do so.

How

Before I began teaching these classes, none of the animation students I advised worked collaboratively. Now, at least half of the animation thesis committees I serve on each year are collaborative. Plus, a growing number of independently-produced animations (i.e., those done outside of any class context) are being done by groups of students. While it's not obviously a direct result of the classes, a culture of collaborative animation has been growing on campus and I tend to think there is a causal relation.

This can certainly strain the evaluation process, in that it can be difficult to properly assess each student's contributions to a collaborative effort. But mechanisms described above alleviate these issues a great deal. Also, the collaborations aren't only taking place under faculty supervision: Hampshire has a community service requirement that students must complete prior to entering their final year, and many animation students are fulfilling this obligation by volunteering their expertise on capstone thesis projects. In these cases, the graduating student writes evaluations for their second- and third-year crew members.

What

Recently, a growing number computer animation students at Hampshire have been pursuing experimental storylines and rendering styles in their project work. This is a welcome change from the throngs of students attempting to emulate their favorite hyper-real studio films, but what is the origin of this change? To be sure, a larger number of experimental short films are available for viewing thanks to online video hosting sites,

and exposure to these films broadens students' palettes. But I put forth the following as another contributing theory: by being exposed to the rigors and challenges of "studio-style" filmmaking in the collaborative classes, the students seek to do something else with their personal work.

In other words, though the classes give students the experience they need to undertake the major, industry-style animation projects they dream of, the classes also manage to fulfill those desires at the same time. Although five different students have approached me regarding their capstone projects for next year, not a single one has proposed "the short, narrative, computer animated thesis film" that used to be so common. Instead, they are seeking to mix animation with writing in a gallery show, to pursue a hand-drawn animation, to combine their interest in video with their computer animation skills, and so on. They now seem to be inspired to do something different with their craft.

I am certain that I will be an advisor on more short, narrative, computer animated capstone films in the future, and some of these films may even be produced by individual students. But the trends on campus have moved towards the collaborative and the experimental, and I expect that trend is correlated with the collaborative animation classes that have been offered in recent years.

Conclusions and Future Work

The collaborative production method described above appears, overall, to provide valuable and engaging learning experiences for both students and instructor. The classes successfully bring together students from multiple disciplines to produce festival-quality computer animation free of commercial interests. They also foster a culture of

cooperation in a field that too often finds students working alone at their workstations. Finally, the classes have produced valuable software tools that benefit the broader animation community.

Lessons gleaned from the three classes described above are being applied to the upcoming fall 2007 course. For instance, the class is scheduled to run 6 hours per week (similar to Duesing) to provide more of the face-to-face time that proved so valuable during the January course. There will be no tangential end-of-term project like the fall 2005 trailer, rather, the class will push towards a clearly-stated goal in terms of the number of shots taken to the next stage of completion. The current plan also calls for only one producer.

There is still much that can be studied about these courses as learning experiences. It would be useful in planning future classes to have a better understanding of how the course contributes to a student's overall liberal arts portfolio. Interviews with class alumni should be conducted and mined for evidence of the course's impact on their lives, whether or not they work in the animation industry.

The benefits of enrolling talented computer science students as production software developers are obvious, but new strategies should be explored for preserving their work beyond the end of term and, ultimately, making it available to the world's animation community. Connections between the collaborative course and a software development course could provide the necessary support for that kind of continued development.

Following industry-standard practices in the classroom does provide students with experience that is immediately applicable beyond the academy, plus, those practices are

demonstrably able to achieve the familiar "style" of modern feature animation. However, given my students' and my own desire to push computer animation beyond the styles and narratives currently available in popular culture, it seems a somewhat illogical choice to stick with the industry model.

One very promising future direction lies in devising *academy-specific* practices, tailored to produce new kinds of computer animated content that fit this goal while still offering the appropriate learning opportunities to the students. The courses discussed here center on experienced students coming together for a single-term commitment. Are there ways to offer enrollment to new animation students as well, while still preserving the coherence of the project? In what other ways can the academy's strengths be marshaled in support of these efforts, without simply emulating industry?

Notes

[1] To name a few: California Institute for the Arts, University of Washington, University of Massachusetts Amherst, Hampshire College, Brigham Young University, Carnegie Mellon University, Ohio State University, and University of Maryland.

[2] Programs such as Gobelins l'ecole de l'image, Institute of Animation, Filmakadamie Baden-Württemberg, and Supinfocom Valenciennes have each generated multiple **SIGGRAPH** Electronic Theater selections in recent years.

[3] Chapter 4 of this thesis offers specific suggestions that may help someone new to directing computer animation, but readers interested in more information should consult texts such as those by Ball, McKee, and Murch (see Bibliography).

[4] The actual spatial resolution was 1150 x 622. A curious number that was chosen because it is twice the number of total pixels as in a video frame, but it matches the 1.85 Academy aspect ratio.

[5] The full festival list for *Displacement* is:

2003 Mill Valley Film Festival
2003 Northampton Independent Film Festival
2005 Tribeca Film Festival
2005 Waterfront Film Festival
2005 Orinda Film Festival
2006 Sedona Film Festival

[6] Guests can visit the system at <http://tower37.hampshire.edu> for a closer look at how it works. Login: guest, password: guest.

[7] "Sketching The Incredibles." Millimeter Magazine Online. 1 Nov. 2004 <http://preview.millimeter.com/mag/video_tool_time_pixar/>.

CHAPTER 4

MY APPROACH TO DIRECTING

Tower 37 is the fourth narrative short film that I have both written and directed. The first was a live-action piece entitled *D.O.B.* made in 1998, the second was *Displacement* in 2002, and the third was *Catch* in 2005. In many ways, *Tower 37* is closely affiliated with this earlier work. It, like the other animations, is done without dialogue. It tells a linear narrative about a particular, character-driven event, yet seeks to make a lasting impact on the audience through allegory.

However, *Tower 37* is by far the most challenging of these projects from a directorial standpoint. Among other differences, it tells a longer and much more complicated story than the prior films, it contains three different characters with unique animation styles, and it has been produced with a constantly changing crew of varying abilities.

This section describes seven facets of my approach to directing that I have discovered to be the most valuable over the course of this most recent production: the use of *drawings*, an understanding of the characters' *back story*, reviewing work *in context*, making use of a *director's circle*, keeping adequate *distance*, voicing my own *uncertainty*, and always asking if the decisions being made *support the story*.

Drawings

Directing and storyboarding have gone hand in hand for a long time, but the idea of carefully rendering an entire film in pencil can be a daunting one. This project offered new insights into what kind of drawings can be useful to a director, and why:

Drawings can be rough. The drawings that went into *Tower 37* were never polished, never refined. Most of them were pencil or Sharpie on scratch paper, often no bigger than 3 or 4 inches across. Many were just tiny thumbnails. I did some amount of cleaning and coloring for the reel, but that was only for the drawings that passed the first phase of review and deserved the treatment. A given drawing may only be on-screen for a second, so clarity is of much greater importance than precision.

Figure 7: Example rough storyboards from *Tower 37* (by Chris Perry)

Drawings are efficient and easy to keep in sight. Certain key sequences of the film received multiple rounds of boards. The two most memorable are Operator's decision to drain the tower and the ending of the film. Sketches for these sequences would sit taped to my wall for weeks, ever-present in my subconscious. When I would look consciously and consider the sequences again, good ideas stayed good and the bad ones made themselves known. A new sketch here, a little scribble there, and the sequence would improve. All without ever touching a computer.

Drawing is a cheap way to get the bad ideas out. First-hand accounts of feature animation story departments point to the pile of unused drawings on the floor as evidence of how brutal the boarding process is. Ideas that feel great to the story artist get ripped to shreds by the director, and the poor boarder returns to do it all over again. I see the process differently now, as a director who made thorough use of boards on this film: the unused drawings are the mountain of ideas that would have made a less-successful movie. The film we *are* making is propped up by that mountain, and brought to a higher level than it would have been in the absence of it.

The Back Story

Books about screenwriting often mention the value of the characters' back story[1]. As the argument goes, a writer is much more capable of breathing life into his or her characters if it's understood where they came from, who they are, what their interests are, etc. As I learned during *Tower 37*, the back story is also an immensely valuable tool for the animation crew.

I wrote the back story of Leed and Mule (Appendix B) on the recommendation of one of the alumni from the *Displacement* class, and this effort proved its value

immediately after the first shots of the film were in animation. In one of my favorite shots in the film (u2_01), suited Leed and Mule appear from behind the silhouette of the tower as they ascend it. On boards, the shot was about dynamic composition and persistence of these climbers. For an animator, that's very little direction. How should they be climbing, exactly? What other acting is taking place?

The back story discussed what made Leed and Mule tick as *characters*, and this immediately spoke to the animation: Leed, mid-climb, could check on his dear friend's progress by throwing a quick look back. Simple, perhaps, but when it plays on screen the moment works beautifully. It remains a shot about persistent climbing, and it still succeeds as an interesting composition. But now, it also communicates a bit about their relationship as well. Every interaction between the two characters throughout the movie benefited from understanding where they came from.

Review in Context

When it comes down to it, animated films like *Tower 37* are produced as small collections of sequential frames, called *shots*. The necessities of production result in these shots being produced in an order that usually differs from the order in which they appear in the show. On any given day there may be in-progress shots to review from throughout the film.

When presented with a shot to review, the natural tendency is simply to loop the shot in a digital movie player over and over again. This certainly provides ample opportunity to study the shot in question. However, this approach carries with it to very big risks: first, it can drive the attention of the reviewers towards details that will never be

seen in the actual film, and second, it can keep important context-sensitive subjects out of the conversation.

The review technique I adopted for *Tower 37* hinged on always seeing shots *in context*. This requires some extra production infrastructure, namely, a person or program that would piece together a slightly larger digital movie containing the appropriate context[2]. But the extra effort pays off: The inclusion of context results in many fewer shots being returned to production to fix some mistake that made itself known in context. This approach also keeps reviews focused on how the shots work together to tell the story, instead of how a shot does or doesn't stand on its own.

The Director's Circle

Over the past two years of production, I've periodically called on four members of the crew (three alumni and one current student) to meet with me and debate the successes and failures of the film as a film. These are individuals who I had prior experience with and whose integrity and creativity I trusted. We purposely assembled at locations and times that differed from those familiar from production to focus our minds on the film, not the making of it. After screening the latest reel, I would invite critiques, broad or specific, and we would discuss them for hours. The term I use for this group is the "director's circle."[3]

These director's circle meetings have had an enormous impact on the telling of the film's story. This group was present from the first days of production, had read the script, had developed their own understandings about the film, and had a shared vision with me of what the film *could* accomplish. These commonalities were necessary because

they permitted healthy debate about *how* to accomplish those goals. Many valuable suggestions emerged from this group's open exploration of the possibilities.

Distance

A familiar piece of advice for someone embroiled in a dilemma is to, "sleep on it." As a director, it is also incredibly valuable to distance oneself from the ongoing decision process involved in crafting a film. A group like the director's circle demonstrated the point very clearly: When we would assemble perhaps twice a year it was as if we were all seeing the film for the first time, and this freshness of vision kept our focus on the issues that impacted the telling of the story.

Ideas that seem amazing at one instant can ultimately prove unsuitable. Prior to the start of production, I spent a month assembling what I thought was a perfect reel for *Tower 37*. I was then distracted for a week by another project. When I returned to the reel, it looked different. I found areas where it ran long, and an extraneous character that I cut completely from the film. I shaved an extra two minutes off the project before ever showing the reel to the crew, due simply to watching it again with fresh eyes.

Now, I frequently take the old advice and sleep on changes before integrating them into the film. Production protocols can even be established to make this an inherent part of the process for everyone. For example, having morning animation dailies (generally) means that animators will finish what they will be showing the night before. During the January production cycle of *Tower 37*, this led to a common, perhaps surprising, pattern during review: instead of sitting quietly while others would discuss their work, an animator would typically have volumes of self-critique. The distancing, it seems, helps everyone see things more clearly.

Voice Uncertainty

Directing a crew of talented collaborators can be intimidating, particularly in the middle of a review when everyone is looking to you for feedback. What if your gut is telling you something isn't right, but you can't articulate why?

On this project, I opted for full disclosure of my uncertainty and found it richly rewarded. I would say in the middle of a review something like, "It's not feeling right to me, and I hate to say it, but I don't know why." I used to fear was that this confession would make the crew worry that their director was not fit for the leadership responsibility. Though this may very well be true, some of the best reviews we had included those moments where I didn't immediately have the answers. The statement of uncertainty, it seems, opens up discussion, whereas a statement like, "here's how you fix it," will shut down conversation on the spot. In this way, the act of openly voicing one's uncertainty actually makes greater use of a crew's talents than not.

Ask if it Supports the Story

Ultimately, all problems encountered during production get resolved. All decisions eventually get made. But what makes a decision *good*? How can you tell if you have made the right decision for the film?

As alluded to in the previous chapter, I have found that the most effective way to answer this question is to ask the following about each decision: does it support the story or not? If it does, then the choice was a good one.

For example, I am fairly ignorant in the area of music. A recent soundtrack review for *Tower 37* included a new melody that began just before the tower begins to collapse. Even though it wasn't a visual element, the new sound would certainly contribute to the

audience's experience with the story. To my untrained ears, it foreshadowed a change by being different from what had been heard before. I knew immediately that the onset of that music needed to be delayed, so that one idea could be concluded in the mind of the audience before the new idea took it over. We made that shift, replayed it, and found it much more effective in its new place.

Discovering what's best for the story at each step of the way is what all seven of these techniques are about. Some may be about efficiency, others about getting the most out of one's crew, but regardless, they all seek to flood the director with good ideas and help him or her find the best one for each particular moment. Directing isn't about having all the answers. It's about being able to find them, and being able to know when you've found them.

Notes

[1] For example, see McKee and Trottier.

[2] In the January 2007 iteration of the *Tower 37* class, the editor assembled a fresh reel containing all the latest animation for each morning animation review. This is the ideal situation as it provides all of the context at once.

[3] When I worked at Pixar, I remember hearing about a select group of crew members on each film that was referred to as the "director's circle." To my understanding, this was a group of trusted employees from across the various areas of production (art, technology, etc.) who met when necessary to consult with the director about the film as a whole. Whether or not my understanding of the Pixar version was correct, that is the source of this idea (and the name).

CHAPTER 5

CONCLUSION

Tower 37 began as a dream.

It has evolved into a film that asks to be viewed alongside *Balance* and *More* (1998) and other short films that put human nature on trial. But where those films present the negative side effects of greed, and where other films similarly offer up characters with obvious fatal flaws, *Tower 37* presents a far more elusive situation. Its tragic protagonist makes all the right decisions, and is ultimately driven by compassion for someone radically different from himself.

The fatal mistake of *Tower 37*'s main character was to be affiliated with an institution that did not share his compassion and understanding, an institution that carelessly hurt others. His fate is comparable to that of those who died in the September 11th, 2001 attacks on the United States, the people who would have called themselves innocent, but who the terrorists called complacent. But where the 9/11 attacks pushed a country into war, *Tower 37* instead encourages an introspective rethinking of the terminology we use ("terrorist" and "victim") and the associations we keep. Ultimately, for our own safety.

The act of making the film has helped demonstrate the effectiveness of a new approach to computer animation education at the undergraduate level. This approach holds promise not only in delivering *Tower 37*, but in offering up a steady stream of animated alternatives to the high-end fare produced in Hollywood. By encouraging collaborative animation in the academy, the medium is more likely to be pushed into new areas that are currently not supported by the market.

Making this film has also served as a multi-faceted education for this particular director. My choice to deliberately construct a tragic allegory within the familiar space of modern cartoons has necessitated a thorough exploration of the techniques used throughout computer animation and contemporary dramatic Hollywood cinema. Having only limited use of a crew has forced me to both invent and adopt strategies for telling the best story as efficiently as possible. These efforts leave me with greater confidence than ever in my ability to coherently usher an idea to completion.

I would never have guessed that one dream would lead to such a journey.

APPENDICES

APPENDIX A

GLOSSARY

(all glossary definitions come from Wikipedia <http://www.wikipedia.org>)

Depth of field: In optics, particularly film and photography, the depth of field (DOF) is the distance in front of and beyond the subject that appears to be in focus.

Open source: Open source describes the principles and methodologies to promote open access to the production and design process for various goods, products, resources and technical conclusions or advice. The term is most commonly applied to the source code of software that is made available to the general public with either relaxed or non-existent intellectual property restrictions.

Pyrrhic victory: A Pyrrhic victory is a victory with devastating cost to the victor. The phrase is an allusion to King Pyrrhus of Epirus (ancient Greece), whose army suffered irreplaceable casualties when he defeated the Romans during the Pyrrhic War at Heraclea in 280 BC and Asculum in 279 BC.

Revision control system: A revision control system is the management of multiple revisions of the same unit of information. It is most commonly used in engineering and software development to manage ongoing development of digital documents like application source code, art resources such as blueprints or electronic models and other critical information that may be worked on by a team of people. Changes to these documents are identified by incrementing an associated number or letter code, termed the "revision number", "revision level", or simply "revision" and associated historically with the person making the change. A simple form of revision control, for example, has the initial issue of a drawing assigned the revision number "1". When the first change is made, the revision number is incremented to "2" and so on.

SIGGRAPH: SIGGRAPH (short for Special Interest Group for Computer GRAPHics) is the name of the annual conference on computer graphics (CG) convened by the ACM SIGGRAPH organization.

APPENDIX B

THE BACK STORY

Leed was always fast and strong. Everyone remembers him zipping circles around the others and leaping playfully out of the water. But he was never big. He always hung out with the big fish (fish?) and while they smoothly cruised along he would bounce between them and entertain them with his antics.

Leed was also quick to act on what he thought was right. When the lake was lowered and the tower struts installed, he tried to rally friends to go and nibble through the metal and "who cares if it will take 10 years" he kept saying. Well, the sheer size and scope of the intruders made it perfectly clear that Leed and his type were powerless, at least physically. So as the water got lower and dirtier Leed just got madder and madder.

Then one day it happened. The pump was turned on and the water level dropped almost instantly from a dirty-but-manageable level to uninhabitable. His parents died, too old to swim and fight their way to the deep areas, too old to fight for food. Leed's anger turned into a mission as the majority of his race died around him.

He never spent much time around the bottom -- it was too dark, and generally too murky -- but now that the water was so low almost everyone had to exist down there. One day soon after the pump was turned on, Leed found a plastic container face down in the muck. He got his big friend Mule to help him flip it over, and a bubble of air that had been trapped in the container rose immediately to the top and popped. It was this moment that set Leed onto his current quest, as he realized that maybe he could

build a suit, a suit that holds water, and maybe he could get his way to a weak spot on that damn tower and exploit it.

It took lots of talking (which Mule couldn't stand) and demonstration after demonstration (which exhausted Mule to no end) to convince everyone to help Leed in his effort. The fishfolk had always popped their head out of the water, at least now and then, but they never really hung out to look around. Well, Leed would get Mule to hold that container underwater until it was full, then hoist it up so it stuck through the surface. Then Leed would swim other fish into the container and up until they were above the water's surface (this always made the visitors gasp). But after a few moments of dizziness and vertigo, the fishfolk could see around. They could see the tower supports, the pipes. They could see (most importantly) the debris stuck here and there in the dry lakebed, and they could plan brief excursions to collect the stuff they needed to build the suits.

Mule went on with this plan, never really asking about it. He liked listening to Leed, always had, and while he got a little rush of excitement when he helped Leed with his various explorations he never really thought about it as his business. It was therefore somewhat of a surprise to Mule when Leed actually asked him to make the ascent with him. Mule figured it would be one of the smarter, faster guys. Maybe the engineers who were putting together those crazy suits. But no, Leed needed muscle. And Mule agreed.

They staged one test ascent to make sure the suits would work, and that almost cost Leed his life. The two of them departed at night, observed by as many watchful eyes as could pop up and out of the water. They made slow progress up the slope of the dried lakebed with a goal of reaching the fence. It was hard work, and the water in the

suits growing a little more toxic with every step (because of respiration) didn't make it any easier. As they crested the top, Leed saw how close the distribution pipe was and signaled that he was going to try for it. Mule tried to shake him off but couldn't (as if he ever could), so he watched as Leed grabbed a rung of the fence and started to climb up to the pipe.

On his second step, Leed brushed against a rusty tear in the fence and his suit popped like an over-filled water balloon. The force threw Leed onto his back, and he started to skid down the steep side of the dry lakebed. Mule, who doesn't know much, knew he had to act fast or else he'd lose his friend. He was wearing the latest pack that was made for him but he knew he couldn't keep it and rescue Leed at the same time, so he dropped the pack right there on the ground and rushed down the steep slope. He grabbed Leed's body (boy was he light without the water in the suit) and hustled him to safety.

When Leed awakened and heard that they lost one of the packs, he was angry and upset. Leed's suit was being fixed already--stitching was easy. But that pack took a month to build, for one, and the seasons were about to change, too. Which meant they couldn't make their true ascent for maybe another year. He wasn't sure they would make it that long. Mule tried to get his friend to rest but he had to endure an epic rant about why he made the wrong call up there, yadda yadda yadda... Finally Leed fell asleep.

Well no one knew it, and no one would have approved it, but Mule put the suit back on later that night and went up solo to retrieve the pack.

Everyone, especially Leed, knew that to keep to their original schedule and do the real climb the next evening would be like asking Mule to pitch on little rest (even

though they know nothing about baseball). He talked with his friend and could hear the exhaustion in his voice. But Mule held firm. He said that if he could sleep all day (and damn him, he did, despite the excitement), he would have enough gas to ascend as planned.

And that's how the two made their way out of the muck that evening, up the steep walls of the lakebed, across the seemingly endless distribution pipe, and, eventually, up onto the side of the tower. Loaded to the gills (sorry) with enough explosives and determination to bring down that damn ball.

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