Innovations Project Report

Traditional 2D Animation

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BA (Hons) Computer Visualisation and Animation : Level H

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1. Introduction

1.1   Aim

To research and acquire an understanding of the main principles of animation and to experiment and execute several short animations of a simple character, with a focus on the movement and performance, using the medium of traditional 2D animation.

1.2   Product

A series of short, hand drawn animated clips conveying feeling and personality through the movement of a simple character.

1.3   Introduction

'Animation is the illusion of life…'
Brad Bird

This project is about the exploration of traditional hand drawn animation. The focus is on creating several short clips of character animation using this medium. However, essentially the project is concerned with researching the core principles and concepts of animation and understanding how to apply them to a drawn character in order to create the illusion of life.

Firstly I will examine the production pipeline used to produce 2D animated films. I will then go on to explore the 12 principles of animation, discovered and perfected by master animators during Disney's golden era. These principles along with any other information I chance upon will then be applied to my own attempt at producing some simple character animation in the medium of hand drawn animation. Finally I will constructively criticise my work, and summarise what I have learnt. The final chapter will conclude the project.

1.4   The Project as an Innovation

This project was innovative to me as I had never before attempted traditional hand drawn animation. Also the fact that after 3 years of studying computer animation I had come to realise that I understood no more about animation than before I started. I was able to distinguish between good and bad animation, but I was not able to explain why one worked and the other didn't.

Until now my approach to animation involved simply sitting down at a computer and creating movement through trial and error, hoping that by constant tweaking, it would look right eventually. This is possible with computer animation as all the animator has to do is create two poses at certain points in time and the computer will do the rest. Making adjustments to the timing of individual parts of a character is easy. However, this is not the case with hand drawn animation as every frame of the movement must be created by the animator themselves. This means that a huge amount of forward planning is necessary. To complete a hand drawn animation, the entire sequence needs to be planned out and to help guide this process animators are expected to have a firm grasp of the core principles of animation.

In attempting hand drawn animation it will be necessary for me to learn these underlying principles as well. This project will help me gain valuable experience and a much greater understanding of animation. I can then use this knowledge to develop a more structured approach to any animated task in the future, be it on computer or hand drawn.

2. The 2D Production Pipeline

Before going any further with this project I thought it necessary to firstly understand how traditional 2D animation is developed from initial concept to finished film. I would then implement these concepts in the development of a method and approach to creating my own 2D animated work.

Any films, whether live action or animated, require a huge amount of forward planning in order to be completed. Methods of producing animated films are continually changing and adapting, incorporating more modern and automated methods. However, the basic underlying stages behind the production pipeline remain the same.

Tony White (The Animator's Workbook, 1986) roughly outlines these crucial stages of producing an animated film:

Script

The first and most important stage of any film production is the crafting of a story. However, with animated films, emphasis is placed on the visual scripting of the action and performance whereas in a live action film there would be more concern for the dialogue.

Storyboard

This is the stage where the actions and events in the script are visualised graphically as a sequential series of images. The creation of a storyboard allows the director to detect any problems with the script and to make necessary changes to enhance the story. A lot of adjustments are made at this stage as once production commences, it is much harder and costly to correct mistakes.

Designs

A style and a look must be agreed for all characters, props, backgrounds and any other visual elements at this stage. The aim is to produce 'model sheets' for each element. The model sheet for a character would consist of the final designs

and proportions along with a series of drawn action poses which the character is likely to assume during the animation. The model sheets are then used as a reference by the team of animators to help keep the look of the character consistent throughout.

Leica Reel (Animatic)

A Leica Reel, or animatic, is simply a filmed version of the storyboard edited together to test how the final edited film would play out. This stage allows for the director to adjust the timing of each shot, plan out action sequences and the soundtrack before the real production begins. It is also at this stage that animation Layouts are produced. This stage is best explained by producer Raul da Silva:

> *'This step is used in setting up extremes for character to be used by the key animator…It conveys different information to the storyboard as it gives you an idea of the action required in the sequence of motion and shows the most extreme character poses in the sequence.'*
>
> (The World of Animation 1979, p.37)

Pencil Tests (Animation)

Once the animatic and all the animation layouts are approved by the director, the animation can finally commence. Using the layouts, the animators complete each shot using one of several available animation methods. They are pose to pose or straight ahead and are described in depth in the next chapter. Once a sequence of animation is completed, then it can be checked by either flipping through the images or sent off to be printed and turned into film. This film of the roughly drawn animation is known as a pencil test.

Cleanup

As each animator has their own individual approach to drawing, it is the job of the clean up artist to make sure the animators work is consistent with regards to design and perspective. Animators are encouraged to draw roughly in a sketchy style as it results in drawings that capture the 'feel' of motion as well as the pose. The clean up artist must then take these rough drawings and replace the sketchy

lines with accurate ones taking into account all the subtle details left out by the animator. The clean up artist must also remain faithful to the careful timing and action designed by the animator.

Inking

Once all the 'clean' frames of animation have been approved by the director they are coloured. Traditionally the drawings would be transferred to thin sheets of acetate known as cells. Colour would then be painted onto the back of the cells. However, this process can now be done digitally.

Checking

The checker has the tedious job of making sure every frame of a film is correct before it is passed to the final stages of production. This involves, amongst other things, checking for broken lines, dirt on the acetate, painting mistakes and spotting mistakes and flaws in the character that don't match the designs.

Compositing

Once checking is completed and the cell approved, all the elements including animation, backgrounds and special effects must be brought together. Traditionally, this was done via a camera man, but can now be done digitally by a compositor.

Final Edit

This is simply the compilation of all the finished frames into one long sequence ready for viewing on the silver screen.

3. The Principles of Animation

One of the aims of this project was to gain a much greater knowledge and understanding of how good character animation works. I wanted to approach the animation for this project in a structured and methodical way with the intention of being able to establish strong personality, emotion and action. For this I needed a much more thorough grounding in the principles of animation.

Thanks to the exhaustive experimentation and innovation of animators from the golden era of Disney animation, a list of solid rules that govern the motion of a drawn character was developed. These techniques and ideas were perfected over many years and became what we now know as the 12 principles of animation.

The principles of animation may appear very simple, even obvious. However, understanding their true meaning and being able to translate the ideas to a sequence of drawings is what mastering the art of animation is all about. Being able to implement these key principles without thinking about them is what every animator should strive for.

The 12 principles of animation as described by master animators Frank Thomas and Ollie Johnston (The Illusion of Life, p46 – p69) consist of:

Squash and Stretch

This element creates the illusion of weight and volume in a character or object. The amount used depends on what the particular animation requires. Over the top cartoons will features extreme amounts of squash and stretch, but a feature length film will use it more subtly and realistically. This principle is based on the fact that even in reality, unless an object is completely rigid and mechanical, it will deform and change shape when moved. This is perfectly illustrated by the flexing and straightening of an arm where muscles under the skin contract and relax. This method is used in all types of character animation from a bouncing ball to a simple character running. It is the most important element of animation that needs to be mastered and will be used often.

Squash & Stretch: Examples of extreme use of squash and stretch. © Disney
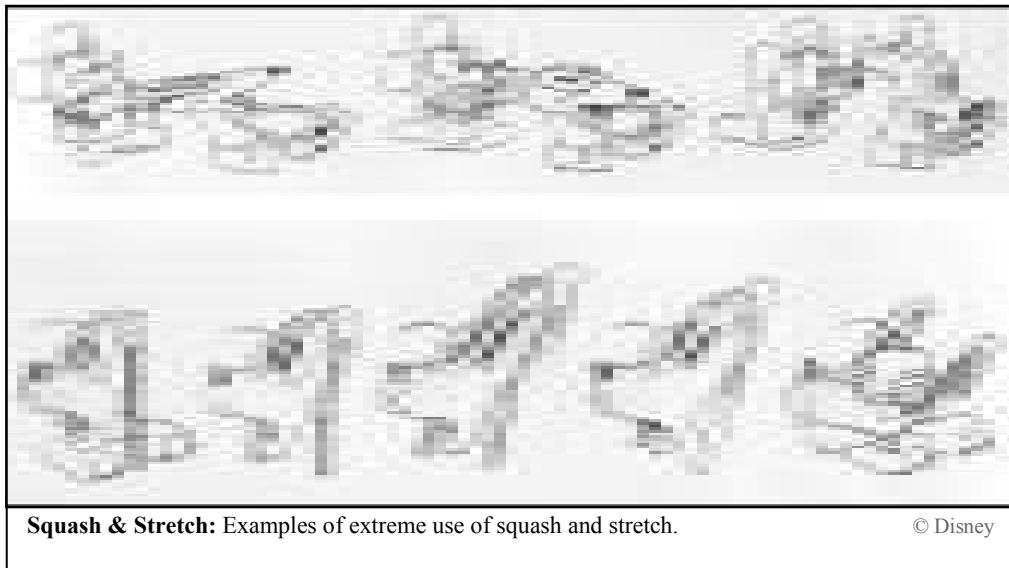
Anticipation

This is the movement that precedes a main action, like a build up to a gag or key motion. In order to understand what is going on onscreen, there must be a clearly planned sequence of actions. Anticipation allows the audience to prepare for what the character is about to do next. It creates suspense and heightens the drama or impact of certain actions.

Staging

This is best summed up by Frank Thomas and Ollie Johnson:

"...it is the presentation of any idea so that it is completely and unmistakably clear."
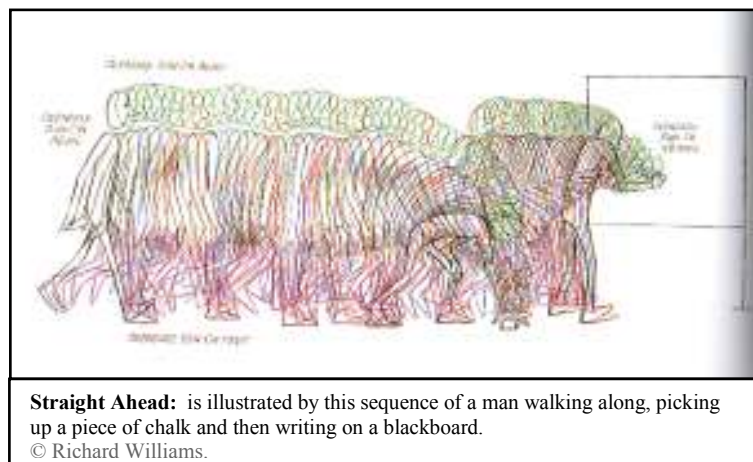
(The Illusion of Life, 1981)

Staging involves communicating an action, personality, expression or mood to the audience in the most effective and direct manner possible. The main aim of an animated film (be it short or long) is to tell a story. There is only a limited amount of time in a film and so it is important that each frame help to make the point of the story. The actions of the character should be crystal clear for the audience to understand. This is achieved through the positioning of the character on screen and how they relate to all other visual elements including the background, other

character and interactive objects. The action should make sense even when simply watching the character's silhouette on screen. Also, there should be one clear action at a time or else the audience will get confused.

Straight Ahead and Pose to Pose

There are two main methods of animating known as Straight ahead and Pose to pose. The first simply involves the animator starting with the first drawing of a sequence and animating it frame by frame until the sequence is complete. There is no real knowledge of how the action will play out and creates some very original and surprising results.

This method is used only when the animator doesn't really know how to plan a sequence out. Richard Williams explains the advantages and disadvantages of this process:

Straight Ahead: is illustrated by this sequence of a man walking along, picking up a piece of chalk and then writing on a blackboard.
© Richard Williams.

Advantages:
- *Produces a natural flow of fluid, spontaneous action*
- *It has the vitality of improvisation*
- *It's very' creative' – we go with the flow, taking all the action as it comes along*
- *The unconscious mind starts to kicks in*
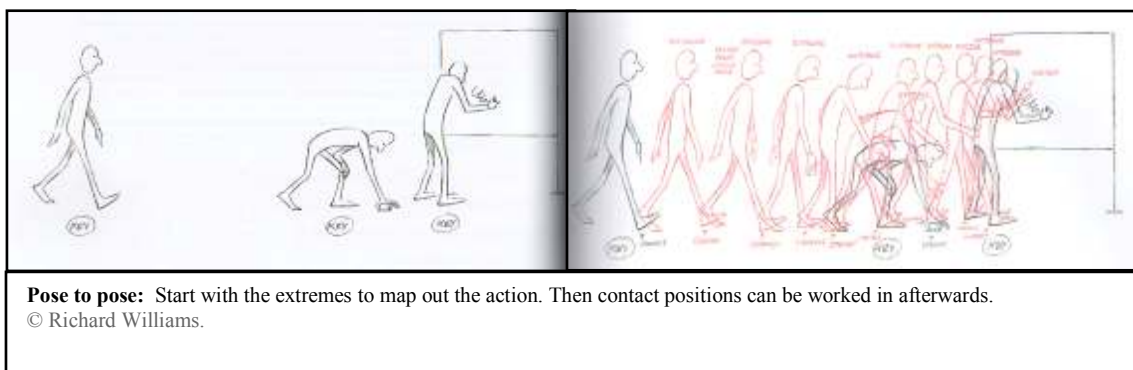- *It can produce surprise 'magic'*
- *Its fun*

Disadvantages:
- *Things can start to wander*
- *Time stretches and the shot gets longer and longer*
- *Characters grow and shrink*

- *Can miss the point of the shot and not arrive in right place at the right time*
- *The director can't see what's happening*
- *There is a lot of clean up afterwards and so the process is hard to assist*
- *It's expensive*
- *It's also hard on the nerves*

(Richard Williams - The Animator's Survival Kit)

The pose to pose approach is to plan out key poses in an action, draw them as best as possible and then go back and draw in the extreme positions. It is then simply a matter of creating all the frames in between these key poses in order to create a smooth motion. These in-between frames can be handed down to the assistant animator to complete using clearly laid out timing instructions from the lead animator.

Pose to pose: Start with the extremes to map out the action. Then contact positions can be worked in afterwards.
© Richard Williams.

Richard Williams again clearly explains the advantages and disadvantages of this approach:

Advantages:
- *Clarity*
- *The point of the scene is clear*
- *Its well structure method of working*
- *Produces good drawings with clear, readable positions*

- *It is in order – the right things happen at the right time and in the right place*

- *The director likes it*

- *It is easy to assist*

- *It is a quicker way of working and frees up the lead animator to do more scenes*

Disadvantages:

- *Misses the 'flow'*

- *The action can get choppy and unnatural*

- *Can be too literal*

- *Misses the 'magic'*

(Richard Williams - The Animator's Survival Kit)

Richard Williams suggests that the best approach to animating a scene is through a combination of both methods. This involves planning out the action using small thumbnail sketches. Once a plan has been thought out, large drawings are made of the key actions and then of any other extreme poses that might be useful. These images then act as guides which the animator can aim for when actually animating the sequence. By starting with the main body of action the animators completes the shot and then goes back over it again adding arms and then again for the head and so on until the entire character is drawn. Again, Richard Williams outlines the advantages and disadvantages of this approach:

Advantages:

- Combines the structured planning of the 'pose-to-pose' method with the natural freedom of the 'straight ahead' method

- Creates a balance between planning and spontaneity

- Creates an important balance between cold-bloodedness and passion

Disadvantages:

- None

(Richard Williams - The Animator's Survival Kit)

Follow through and overlapping action

When a person comes to a stop after running, they do not simply stop. The laws of physics dictate that all the rest of the body will still have momentum and therefore will still be moving. Incorporating this idea into animation is known as follow through. Overlapping action occurs when a character changes direction, but the clothes or any other limp parts of the body keep following the original path of action. Basically it means when individual parts of the body have to catch up with the main body.

Slow in and slow out

This is the idea of varying the timing and spacing between successive drawings to make actions speed up and slow down. Fewer drawings between two poses make the action faster and more drawings make it slower. Slow in and slow out creates a more natural and realistic motion when executed correctly. Slow in can also be thought of as deceleration, slow out as acceleration.

Arcs

This is the idea that all actions follow an arc or a slightly circular path. The exceptions to this rule are the animations of mechanical devices or gadgets. Arcs create a much more natural and flowing movement and are particularly important when animating the human figure or the actions of an animal. All body movements, from the swinging of an arm to the turning of a head, describe an arc through space. Because of this it is most convenient to consider any natural movement like the swinging of a pendulum.

Secondary action

This type of action is used to enrich and enhance the main action. It can heighten the emotion or mood of a character animation, adding another dimension to the performance. These actions are normally very subtle with the aim of complimenting or increasing the impact of the main action. For example, a melancholy character traipsing miserably down the side of a road. The feet are dragging; the body is limp and non-threatening. The secondary actions would involve any other actions that support and increase the characters sense of misery.

They might include a heavy lulling of the head, a dramatic and mournful sigh or a distracted kick at something in the path. If the characters walk is his main action, then all other actions of the body are secondary or supporting action.

Timing

'Timing is the part of animation that gives meaning to movement'

(Timing for animation, 1981)

Timing is one of the hardest elements of animation to get right as it defines the speed at which all the actions occur. Some very basic ideas can be highlighted. They are simply that the more drawings placed between poses creates a slow and smooth action whereas fewer drawings make the action faster and snappy. Most animation is done on twos (one drawing accounts for 2 frames of film) and are used whenever possible, saving a lot of work. More subtle or faster actions are animated on ones (one drawing for each frame of film). Also, careful timing must be considered when a character is acting in order to establish mood and emotion. When incorporating the use of elaborate secondary actions and overlapping movement it is easy to see how complicated animating can become as each individual element of the shot will need to be timed separately. If one element is timed poorly then the entire scene would fail no matter how well everything else worked. For this reason there is no other way for an animator to learn timing actions correctly than to sit down and work on it through trial and error. Expertise in this principle can only be gained through experience and personal experimentation.

Exaggeration

Exaggeration means to extract the essence of an action and enhance it to make it more convincing. If an action from a live action film was simply traced onto paper and played back as an animation, the result would be a very rigid and empty performance. To make movement more natural it needs to be broader with more emphasis on the facial features, expressions, poses and attitudes. Frank and Ollie describe it as a
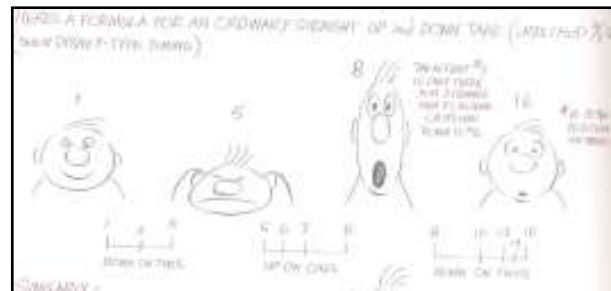
'Caricature of realism'

(The Illusion of Life, 1981)

The amount of exaggeration varies depending on the style of animation being created. A short cartoon will contain excessive amounts of exaggeration for a more in your face result. However, it is easy to go

Exaggeration: An excellent example of exaggeration is the take. © Richard Williams

overboard and create something too theatrical and over animated. Animation is about clarity and exaggeration should be used to re enforce that idea.

Solid Drawing

In hand drawn animation this is probably the most obvious and simple principle to grasp. In order for an animation to work it must be drawn well. Drawings should have weight, depth, balance and all the other basic aspects used to create the illusion of solid, three dimensional shapes on paper. Also, when put together as an animated sequence, the drawings must work together and form the illusion of fourth-dimensional life. The fourth dimension is movement in time.

Appeal

This is to create a character design or an action that the audience will enjoy watching. Appeal comes about through simplicity of design, clear drawing and the development of a personality that will captivate and intrigue the audience. Every character, whether heroic, evil, comic or cute should have appeal.

4. Method

Despite studying all the stages in the process of producing an animated film, it was decided early on that the focus was only going to be on creating the 'pencil testing' stage with a minimum of clean up. Throughout the project it has been stressed that the focus is on creating some simple character animation. It was therefore irrelevant to work through any of the other stages in production.

4.1 Practical Issues

Having now researched and acquired the basic knowledge needed to attempt character animation in this medium it was time to bite the bullet and have a go. However there were several issues that I had to address first. The medium of traditional animation was entirely new and required me to learn several new practical elements. These included using a light box, choosing which style of peg bar to use (top or bottom) and the act of flipping and rolling images to test the animation.

Adapting to these new techniques would ultimately be achieved through experimentation and practice. The light box in particular proved quite a daunting prospect; however it was not hard to adjust to working in an angled position and the ability to see through up to 5 sheets of paper was invaluable to the task of animating. Selecting the peg bar was a simple choice. I couldn't stand the feeling of the lower peg bar getting in the way of my wrist while drawing so I opted for the top. However, the act of rolling is something I never quite got the hang of. This apparently takes a lot of practice to perfect and so instead I checked my drawings by flipping back and forth between two consecutive frames to check the motion between them. This is not as effective as rolling five frames at once, but it sufficed for this project.
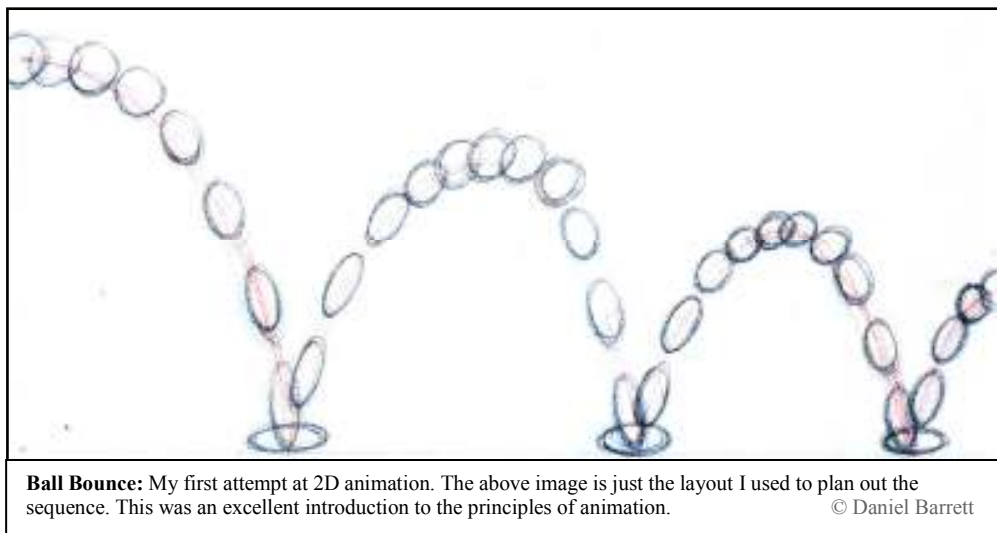
4.2 Initial test

My first attempt at animation was the classic ball bounce test. According to Frank Thomas and Ollie Johnson this was 'the standard animation test for all

beginning artists' (The Illusion of Life, 1981). It is a very simple exercise and requires representing the ball by a simple circle. My aim was to make the ball travel from one side of the screen to the other, gradually loosing momentum with each successive bounce. Although the idea is simplicity itself, it is a highly valuable lesson in the mechanics of animating a scene, while also introducing the principles of timing and squash and stretch.

The task was very straight forward and completed easily. Initially I created a layout for the action, by drawing the arcs of each bounce and then drawing all the positions of the ball over the top, keeping in mind the basic principles of animation. It was then just a case of tracing each position onto an individual sheet of paper, editing the frames into a short film, and then watching the result.

Ball Bounce: My first attempt at 2D animation. The above image is just the layout I used to plan out the sequence. This was an excellent introduction to the principles of animation.   © Daniel Barrett

4.3 Choice of character

My initial thought for this project was to design a completely new character and animate all their features fully. It then occurred to me that it might be more interesting to leave out the detail and focus solely on creating a personality and character through his actions and movements alone. After all, it was my main aim to focus on the animation and timing aspects and not in fine details. It is for this reason that I chose to leave out the character design stage, opting instead to animate a very simple character with no detail except the proportions needed to suggest a human. All that I needed of my character was clarity and the ability to create strong silhouettes.

Another reason for this choice of simplicity was, being that this was my first attempt at hand drawn animation, I did not feel entirely comfortable with my ability to draw a character in the multitude of different poses that would be required. However, this was only a minor consideration. The point of the project was to learn the basics and that could definitely be achieved with a simple character.

4.4 Power Centres and Line of Action

As it was decided that the character would have no defining features, there would be no visual communication of his personality through his appearance. This would have to be achieved through his movement and posture alone. Animator Keith Lango was able to provide some excellent tips on how this might be accomplished with the idea of 'power centres'. Keith Lango explains:

'A power centre is the place in a character that seems to be the source of their energy and exerts the primary influence over their posture, gestures and actions.'

(http://www.keithlango.com/tutorials/old/powerCenter/powerCenter.htm)

The power centre works roughly in line with the centre of gravity, keeping the character in balance, but also defines how they arrange all their bodily features. A depressed character would have a very low power centre, below their waist and out in front, dragging them forward and down to the floor. This would cause the characters back to arch forward, head lulling, the arms would hang down low and the knees would buckle slightly. Whereas a happy and confident

Woody and Buzz are excellent examples of characters with clear power centres. © Disney/Pixar

character's power centre would be positioned around their chest area, making

them stand up tall with their head back and their chest thrust out. Understanding this concept makes visualising a characters personality much easier. Also, although a character will have a default power centre that describes their personality, it is possible to move it around to show a transition between two emotions. So one second the character is depressed, with a low power centre, and the next they are happy and hopeful with the power centre moved up to the chest.

Another concept that helps to visualise a particular pose for a character is the line of action. Animator Chris Webster explains that the line of action

'...entails creating a single line that runs through the figure on each of your rough key frames describing the dynamic flow throughout a sequence. Using the Line of Action you are able to strip your rough animation bare of detail and concentrate on the main thrust of animation.'

(Animation: The Mechanics of Motion, p52)

This idea is and excellent way of planning out the key frames and getting to the heart of the action. With a strong line of action at the key points in a sequence, the final animation will have a clearer, more easily read motion and the action will have much more impact. Fine details can be added once the main flow of movement has been accomplished.

A strong line of action results in a more dramatic and dynamic pose. © Preston Blair.
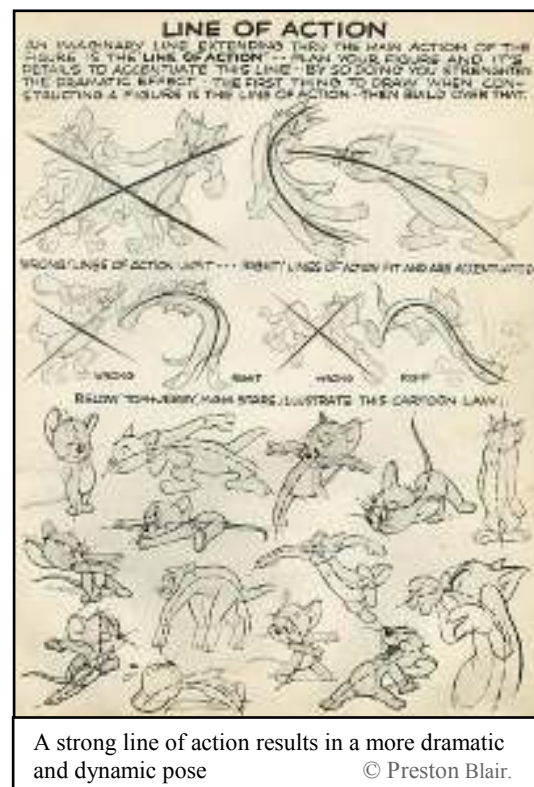
4.5 The walk

Another decision that was made early on in the project was that as well as not designing a detailed character, I would not be telling a story either. I purely

wanted to focus on the animation alone rather than crafting a story through sequential shots, each containing a different attempt at animation. I was also daunted by the fact that I had never attempted animation in this medium before and so did not want to stage a scene where the action would be too complicated. For this reason it was decided to keep the actions simple, but lacking any story to tell I was at a loss to decide what actions to animate.

This is where advice from Ken Harris sparked off an idea:

> *'A walk is the first thing to learn, 'cause walks are about the toughest thing to do'*
>
> (The Animator's Survival Kit, 2001)

All walks are different. No two people in the world walk in exactly the same way. For this reason you can learn a lot about a person through simply observing the way they walk as it projects personality and state of mind. Richard Williams explains:
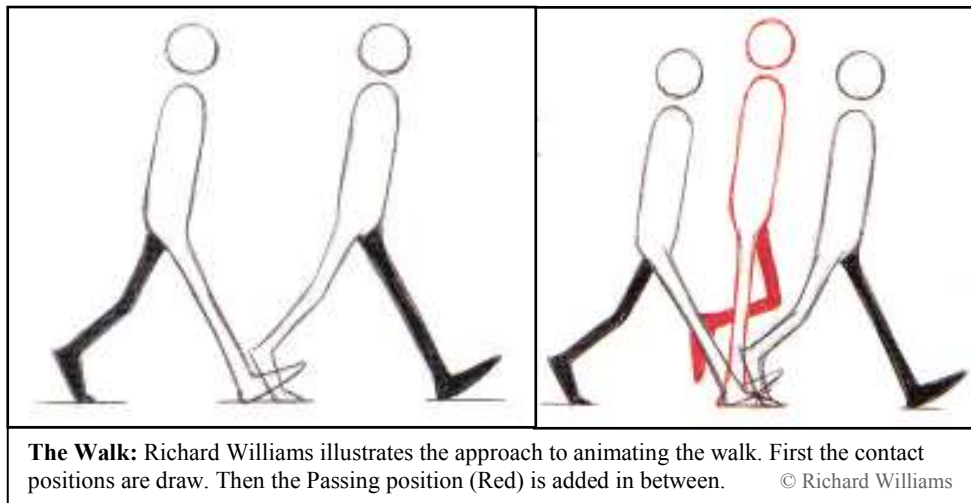
> *'Actors try to get hold of a character by figuring out how he/she/it walks – try to tell the whole story with the walk'*
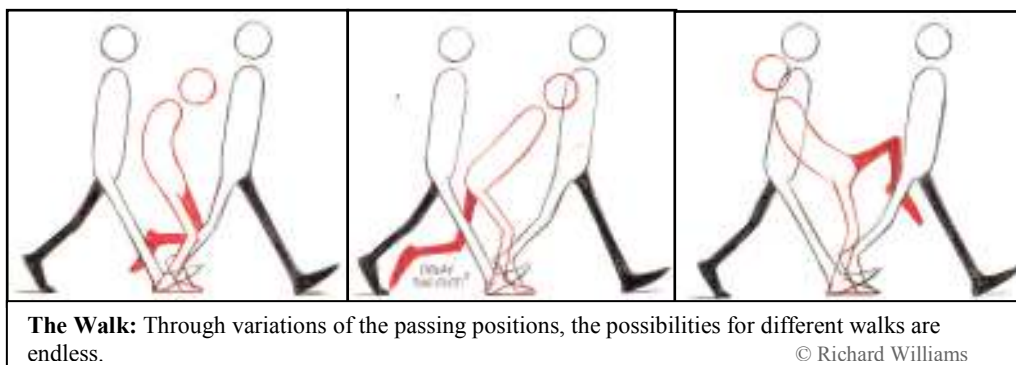>
> (The Animator's Survival Kit, 2001)

This seemed like an excellent action to start experimenting with as it would provide me with an excellent platform for trying out some acting and showing off some personality. However, before attempting to animate my own walk cycles it was necessary to learn a bit more about how to go about breaking down the action. Richard Williams again provides an exhaustive amount of information on the topic of constructing a walk cycle. Without going into too much detail, as this is such a broad topic, I will try and outline the approach that I chose to follow using Richard Williams information as a guide.

For a normal walk the first stage is to draw the two contact positions. This is the position where the weight is most balanced as it is spread evenly between the two feet. Then a passing position is drawn between the two contacts, with the leg taking the weight straightened out making the body and head move higher than in

the contact positions. It is then simply a case of drawing the frames in between these two extremes to create a flowing motion in and out of those two poses. This will create a walk.

The Walk: Richard Williams illustrates the approach to animating the walk. First the contact positions are draw. Then the Passing position (Red) is added in between.   © Richard Williams

However, the fun happens when the passing position is dramatically different to the contact. Simply angling the body in a different direction, tilting the shoulders, bending the torso or bending the supporting leg instead of straightening it all result in a very different style of walk. The same applies to varying the contact position. Ultimately, by varying the contact and passing positions, an infinite number of walks are possible through this very simple three drawing approach.

The Walk: Through variations of the passing positions, the possibilities for different walks are endless.   © Richard Williams
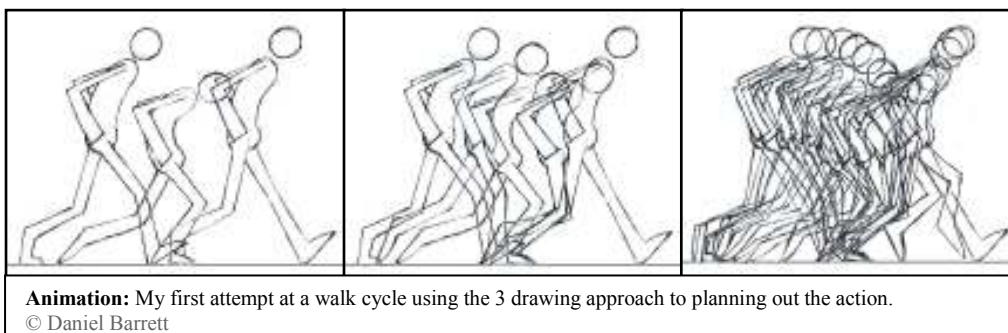
4.6 Animating

Armed with a wealth of new information and ideas it was time to start putting it into practice. I had already completed a relatively successful ball bounce exercise. It was now time to focus on some character animation. This would

involve crafting a series of short clips. My first two attempts were at walk cycles with personality.

Using the contact method outlined in the previous section I drew the character in the two key poses of the walk (the contact and the passing position). The first walk I designed was an exercise in restraint. Richard Williams points out that the major beginner's mistake is 'doing too much action in too short a space of time' (The Animator's Survival Kit, p99). Therefore my aim was for a subtle and less energetic walk. The scenario was that the character was to look dejected with very low self esteem. The weight of the world is bearing down on him. This would be a very slow walk in which the character is bent forward, his head lulling and his feet dragging. Once the key positions were decided I then had to decide on the timing.

Knowledge of timing comes about through experimentation and trial and error and so I could only guess at this stage. For the first walk I decided that one second per step would create the right effect. Also I would animate everything on twos therefore 12 frames were needed to complete each step. That meant 5 frames in between the key positions. In order to get the in-betweens right I planned the animation out on one sheet of paper first. Drawing points positioned on arcs between the key poses on the same piece of paper enabled me to plan all the spacing and proportions of the character for each in between. Arcs were used in order to decide the motion of each joint as all body parts move in a slightly circular motion. It was then simply a case of constructing the character out of the points for each key frame using the light box.

Animation: My first attempt at a walk cycle using the 3 drawing approach to planning out the action.
© Daniel Barrett

I used exactly the same approach for the second walk cycle. This one however, featured the character in much more cheerful and energetic mood. I wanted the walk to be quicker and the action to be much more exaggerated. To achieve this I designed two very contrasting key positions. When it came to creating the in-betweens I paid a lot more attention to the arcs that the body parts created and on easing in and out of the key positions. The walk was timed on 16s (16 frames per step so 3 steps every 2 seconds) to create a more lively pace. Again, this animation was completed on twos.

Animation: My second attempt at animating a walk cycle using more exaggeration.   © Daniel
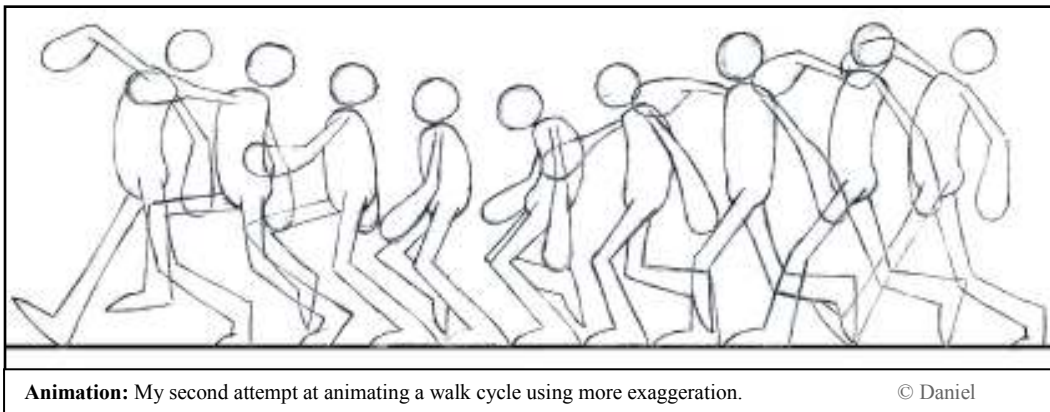
thing in particular became very apparent. In both of the walk cycles the passing position had been planned on the very middle frame of the step. This resulted in the character hitting the key positions in a very strict rhythm. This didn't look bad or wrong, but it wasn't quite what I had been aiming for. It was suggested by my tutor to go back and simply play with the timing of each frame until it looked right.

I had animated both the cycles on 2s so each drawing was held for two frames of the animation. By simply changing the timing so that some drawings were held for one frame and others for three while leaving the rest on two, I was able to create variations of the walks with more feeling and a more varied rhythm closer to how I had imagined the walks in the first place.

For the third animation I attempted something a little different: a walk towards the camera. However, despite the changed direction of travel, I still used the same method as before: drawing the contact positions first and then the passing position. The in-betweens were a little harder to figure out, but using some general knowledge about perspective and a little common sense was all it took. The attitude of the character in this sequence was supposed to be angry with a forceful

stride towards the camera. Upon playback I don't think I really captured that feeling in the motion and the arms look a little strange. However, the motion towards the camera worked really well and was fairly pleased with the result. Just a slight adjustment of the timing was needed to make the impact of each step a little heavier.

**Animation:** My third animation exercise: a walk towards the camera   © Daniel Barrett
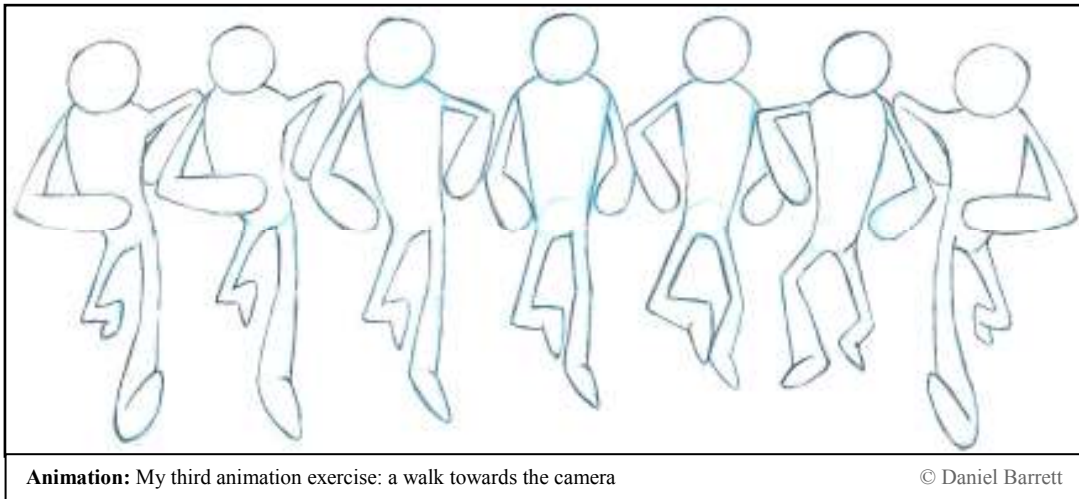
The final clip of animation that I attempted was a short action sequence. Originally, before starting this project I had intended to tell a story through creating a sequence of shots. The character would be something similar to an assassin or a 00 agent, and the scenario was that he had infiltrated a building and was sneaking around trying to locate his target. One shot that I envisioned was that of the character dropping down from the top of the screen, landing heavily, looking about him alertly and then running off screen. I felt that this was a fairly simple sequence of actions which offered several opportunities to experiment with some of the other principles of animation that I had not yet had a chance to put into practice.

In order to accomplish this sequence I opted for a combination of pose to pose and straight ahead as I had no idea how I would time most of the movement. This involved planning out the sequence as a series of thumbnails to get an idea of his movement through space. I then produced a series of key poses, with careful consideration for the spacing and position of the character as he would be following fairly direct paths of action. I then simply took the first two key poses and using the straight ahead method slowly built up a series of in-betweens. I then

did the same for in between the second and third key poses and so on, chronologically through the sequence, guessing the timing as I went along.

Unfortunately I was unable to complete this animation as I time ran out and for that reason it is still very rough. Some of the very last frames are even missing arms. However, I feel it was a fairly successful exercise and was a great deal of fun.

Landing: The straight ahead method was used to animate this sequence where the character lands.   © Daniel Barrett
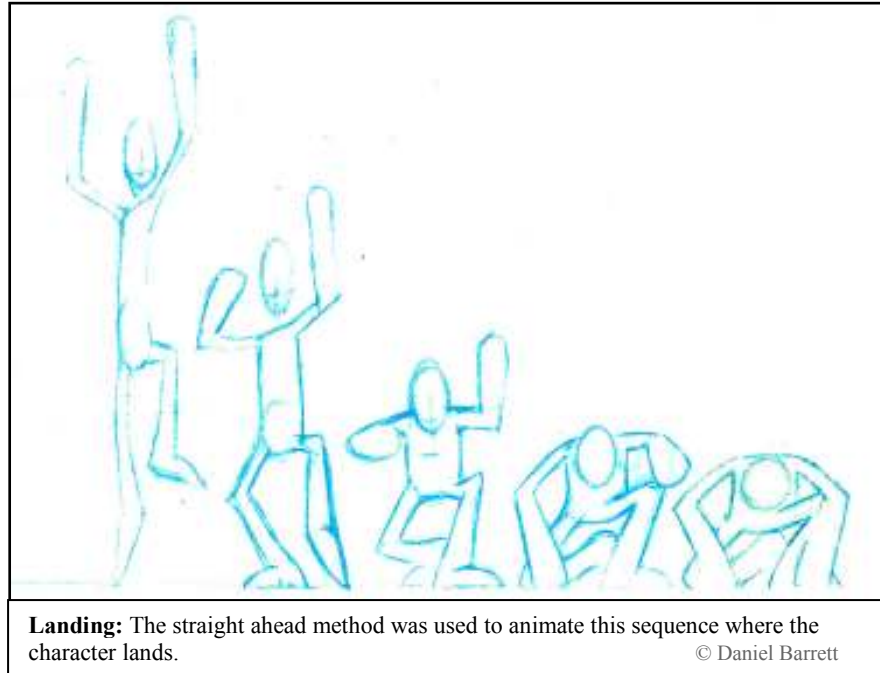
4.7   Digitizing and compiling the frames

The final task before being able to view the finished animations was to convert them into some form of video. The only solution I had was to digitize and import all the frames into Adobe Premiere, where I could edit them together into a sequence. For the ball bounce exercise this was initially done with a digital camera, but produced a rather poor result. The lack of a tripod contributed to this, but also the lighting conditions in my room did nothing to enhance the images. The scanner produced a much higher quality of image and so I opted for this method for the succeeding animations. All the images were scanned directly into Adobe Photoshop where, if necessary, they were cleaned up. They were then simply transferred to Adobe Premiere for editing. This method very tedious, but once completed, it was very easy to adjust the timing of the frames and then quickly viewing the result.

5. Conclusion

5.1 Regrets

My main regret is that I was not daring enough when attempting this project. I consciously chose not to develop a story and to avoid designing an original character. Avoiding these steps meant that my animation lacks any real meaning except for the personal achievement of creating some traditional animation. Designing an original character would have presented a much more challenging task and success would have arisen out of being able to give the character personality in his movement that reflects his appearance. Also, attempting to tell a story through creating a short animated film would have proven a lot more rewarding. The extra challenge of keeping the movement in each consecutive shot consistent and making the character interact with objects and a background would have added another dimension to the animation. Putting all these elements together would have created a more appealing and involving animation.

Another area that I wish I had been more daring was in the execution of the animations that I actually completed. All the actions are very basic and there is no real experimentation within the actual movements. The walk cycles consist of two steps each with no attempts at any secondary animation or change in rhythm. The reason for this is that I was afraid of failing and getting it all wrong, but in retrospect that is what this project was all about: experimenting and attempting something completely new. I could only gain from getting it wrong, as the next attempt would involve taking a different approach and learning from my mistakes.

5.2 What I have learned

When undertaking all the exercises I was consciously trying to incorporate all the principles of animation. I tried to keep the volume of the character consistent, and create the impression of weight through squash and stretch. The staging of the animations wasn't really necessary as there was no character interaction or background, but even so I tried to keep the silhouette of the character clearly

defined at all times. I tried to vary the method of animating, opting for a mix of pose to pose and straight ahead animation for the last exercise. Exaggerating the action made the movement more interesting. Arcs were used to keep all the action natural looking. Slow in and slow out to vary the timing and texture of the motion. I tried to incorporate some follow through and some anticipation in the final exercise, but did not really achieve the desired results. There was not much chance to include secondary action, but I am never the less more aware of it now and will strive to use it in the future. The only principle that I did not really apply well was that of solid drawing. However, the aim was to create some motion out of pencil drawings and I think that goal has been fulfilled. I believe all areas of the animation could be improved a great deal, but as a first attempt I feel that I have been quite successful in creating an appealing few clips of traditional animation.

5.3 Conclusion

The main aim of the project was to learn new techniques and develop a more structured approach to character animation. Implementing the 12 principles of animation, studying the concepts of power centres, learning how to construct a walk cycle and finally making an attempt at animating in a new medium has all added up to being a very enlightening experience. Although being slightly disappointed with the final results I have learned a great deal through completing this project. There is still much more to be understood, but that can only come about through further experimentation and development of my skills.

The wealth of knowledge I have accumulated through completing this project will be invaluable in the future. Actually sitting down and thinking through an entire action, considering the movement at every frame has been a great experience. I can now take the lessons learnt during this project and apply them to all forms of animation. Instead of simply flying blind and animating through trial and error, I will be able to approach a scene in a more structured and methodical manner. My animation can only get better. Being able to state this fact confidently means that this project has been a success.

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