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No way out

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NO WAY OUT

By

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Janice Leigh Johnson
April, 1993

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This thesis project is dedictacted to God, to my mom and to my dad. Thank you for believing in me and assuring me that anything I set out to do, I can accomplish. This was surely tested and proven with the completion of my thesis. I could have not finished this project without their love and support mentally, physically, spiritually and financially. Thank You!

I love you.

PREFACE

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In a time when society is known for its' technological advances, its' futuristic hopes, goals and achievements; it is astonishing to find that poverty and being homeless is still prevalent in this country today. I chose to make known my feelings about this sociological tragedy and show that poverty can be expressed as a real issue through computer animation. The idea of using a computer to express the reality of poverty creates an interesting contrast. Which do we look at for the future? The advancements that computer technology represents in this technical era or our continuing battle with the plights of poverty.

I feel exceptionally strong about how senseless being homeless is in this country. Not only are the adults who get caught up in the systems, victims, but the children of these adults become the innocent victims. If the parents have no future, what hope do the children have? They have "No way out," which very quickly became the title of my story.

I based my thesis on the overwhelming problems of poverty and being homeless. My thesis deals with the struggle to survive within a society that looks upon its' own kind with disgust and disgrace. This project documents the cold hard realities of poverty prevalent in societies throughout the world. Yet, it is not to debate the issues of what the government or society does or does not do for the poor. It is written to document my problems and solutions using computer animation to express poverty.

With the topic of poverty I go further to say: look at what is existing in our society. That poverty and being homeless exist and one individual can make a difference. The importance of correcting the problem is major. One

of the unfortunate problems with poverty is that it is almost always with us. Poverty needs to be eliminated for our society to be able to function as a productive and united entity.

I would like to thank my committee for their time, patience and the excellent advice in helping me complete my thesis. To my roommate Sarah, for putting up with me and who knows things would have been very difficult if she were not around. Also to the Rundell Library for the images of poverty.

CHAPTER ONE

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THOUGHT PROCESS

When I started the process of the thesis, I wanted to do a film relating to some real sociological issue presented as fiction, but based on real life. I first decided on a topic of "the homeless." As I got more involved, I decided to focus my work on homeless children, because they are the pure innocent victims.

I first thought of showing problems that exist on the streets. Do the same problems exist for the kids? How do children really see their surroundings, especially when that child is alone?

I started the script with ideas that would help me express the senselessness of poverty. I wrote about a young boy who is on a train. He begins to think back about how he got there. He comes from a poor violent family and runs away. He escapes on a train because that train takes him away from his neighborhood; thereby showing differences in the environment. This gave me an extremely simplified story to began my thought process. At this point I began to develop all my major points and ideas I wanted to say in the film.

One of the ideas that I wanted to get across was the extreme differences between the crowded run down housing and shelters the poor are forced to live in versus the nice houses and clean neighborhoods non-poor reside. In order to show this transition, I put the boy on the train enabling him to travel from one environment to the other. As my story began to develop, the train not only represented a device for travel, but it started to become a safe haven for the boy.

Another point I developed was emphasizing the clean neighborhoods.
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As the story developed I realized that the importance of showing a clean neighborhood was not as important as stressing the poor environment. So I chose to show a beautiful vast landscape, with no building structures and place it at the beginning of the story. This way the audience can see the contrast of a beautiful countryside and following that scene be shown the dirty, rat infested streets of a poverty stricken area.

Most kids in poverty do not have any hope, any desire to get out of their situation and off the streets.[1] I needed to give the boy some hope. Because of dangers on the street (drug dealers, hustlers, etc...), this would be the only reason the kid would not get involved right away. The hope was a picture of the little boys' family. So now I had to develop the picture as something so important to the kid, he would risk his life in order to keep his picture. While I was thinking about how I could make the picture important, I discovered that there was a connection missing in my story. This connection was "why does the boy go to the train yard?" My previous connection (about the two environments) was very weak. I needed something solid. With this question in mind I decided to create more emphasis on the family photograph. The family photo represented a symbol of hope and happiness by having smiling faces. But why is the family smiling at this particular time? The following is a short piece I wrote to create the scenario for the importance of the picture.

> There was a particular day when an old freight yard was turned into a circus area for the people in the community. To celebrate the opening, the event had free popcorn, free toys and free family photos. The boys' family decided to take a free family photo and the little boy was given a free toy train (which is shown in the picture). Unfortunately for the boy, this is the only day he can remember his family ever smiling. Or he himself ever really being happy.

Throughout the story I re-emphasize the importance of the picture over and over again, in various ways, to develop the great significance it has to the boy. For example there is a flashback used where the boy looks at his family picture and reflects back to his past. This was used in the beginning of the story to show that the young boy is old enough to think, to feel. Kids at a very young age are able to put two and two together and come up with an answer. It may not always be right, but they have the ability to use deduction. If they are at that age where deductive reasoning takes place (If I touch that hot stove it will hurt) then they have the ability to be affected not only physically but mentally.[2] It does not take long for a kid to start to notice and feel the affects of poverty. They can do absolutely nothing about it. If the parents are not helped, the kids do not get helped.[3]

The boy faces different encounters in the film. Since the film style is surreal, most of the encounters represent dangerous situations that may happen in the type of environment the boy is subjected to in his neighborhood. There are specific scenes that show off this trait. They are the dog scene, the fire scene and the scene where the boy runs along the outline of a silhouetted city. To explain further, in the dog scene there is a group of dogs eating out of a garbage can. The boy sees an old candy wrapper (thinking it is food) and bends down to pick it up. One of the dogs turns and sees the boy. Exaggeration is used in some scenes to emphasize the seriousness of the topic. The hitting of the woman, the mad dog and the raging fire are some things that are feared by the boy in the film. The effect is achieved by making those objects larger than life. So instead of having the dog start barking, chasing the boy, another approach was taken. The dog who saw the boy, was scaled out making the head and especially the teeth abnormally large, filling

the screen. The sound the dog made was not barking, but it was a monstrous sounding growl exemplifying the ferociousness of the dog. The scene was done this way because it expresses the way the little boy may see the dogs or even tell the story.

The fire scene begins to develop more of the problems that happen in the streets. The boy runs into a can with burning garbage while running away from the dogs. After the boy bumps into the can, the fire rages up turning into various shapes that threaten him. The fire comes at the boy in different angles collaborating with the musical score. Since the background of the city streets fade out, there is only the garbage can, the fire and the boy now in the scene. This gives the audience a view of what the boy would see. He is not aware of other things which may be going on around him.

There was some question as to this scene being too long relative to the overall film. Yet others seemed to appreciate the longevity of the scene. I received mixed opinions on this but decided to leave the scene as it is, with many reasons to do so. First, the time the audience takes to look at the scene, gives them time to let their thoughts catch up to what they have just viewed. It lets the brain think about what has happen up to this point. The fire becomes symbolic of things that happen to the boy on the street. In a piece such as this, I felt that not all occurrences that happen in the streets need be shown. To show the actual drug dealers, pimp pushers, robbers, muggers, killers, etc..., I feel was not necessary. The fire and its' many shapes are representative of things that are attacking the boy. I wanted the viewer to let their imagination work for them. Also by doing this scene, in terms of the animation, I got a chance to focus directly on music and movement. Similar to an assignment that was given to my first year animation class. It was in this class I received knowledge of Digital Harmony by John Whitney. In the

film there are lines and shapes that correspond to the music. Not necessarily telling a story, but leaving the viewer with their own interpretation. In the Legend of Sleepy Hollow by Walt Disney and company, there is a scene where Ichabod Crane, is riding home from a party at night. He is already jumpy from the headless horseman stories he has heard at the party. As he continues to ride alone in the darkness his imagination begins to get the best of him. Weeds rustling in the wind become something frightening in the bushes. Cattails swaying back and forth become eerie creatures peering at him through the darkness. In another film, Fantasia, also by Walt Disney; the animation part of the film tells the individual stories with music and animation only. I refer to this style as "dancing with animation." The two are partners one in sync with the other. When the music does not coincide with the animation or vice versa, that is when one of the partners "steps on the others toes." They do not flow together. I saw The Legend of Sleepy Hollow first and got the idea for my fire scene. I viewed Fantasia after I was nearly finished my film and once again saw how the "Guru of Animation" Walt Disney, mastered this technique. In my film the fire scene is a humble attempt to experience what only a few great animators are pros at doing; "dancing with animation."

The scene where the boy runs along the outline of a silhouetted city represents the boy being afraid and running through city streets. While he is running the boy sees all the images of poverty around him. This was done by adding digitized black and white photographs of poverty stricken people. Different images were flashed on the screen repeatedly while the boy was running. There are a number of reasons why I chose this effect. The main reason was that I wanted to show as many different images of poverty that I could. I wanted the viewer not to dismiss the issue or take the issue lightly

because it is an animation. I wanted this contrast in imagery to make sure they remember that it is a real life problem. One other reason is that instead of creating many scenes where the boy would be confronted, these images are representative of what would be conflicts which he or anyone in his predicament might encounter.

All through the story poverty is clearly stated. This is true up until the end when the young boy dies. The boy is on an old freight train in which the ride is very rough. As he looks at the picture, the train goes over many bumps and the picture comes jarred from the boys' hand. The boy tries to keep his balance as he attempts to grab the picture. He leans against the old wooden freight car door and the door gives way. The little boy falls out; coming close but never being able to retrieve the picture. This part of the story only re emphasizes the seriousness of poverty. In the film I express a real sense of sorrow by having such a tragic ending. I wanted to have the audience feel very sad for the little boy and have them have a feeling of wanting to help. That maybe they can help in some way. Although we do not actually see the young boy fall to his death, the audience makes assessments as to what actually happens to the boy at the end. It is assumed that when someone falls out of a train they will most likely die. The connection that gets missed relating that last statement with poverty, is that when someone has no education, no shelter or home, and no food or water that person will also die.

At the last part of the fall, everything in the picture turns black and white. The reason I chose to do this effect coincides with the reason I chose to fade to black and then in bold white letters put the words "Poverty Kills" at the end. This is the message of my story. Words are the way most people communicate; express themselves.[4] Therefore to use words in the film

heightens the viewers understanding and restates what the whole film is about. The reality that I wanted to get across in the film is that, not only was the boy driven to an unfortunate death because of situations that happen to him, but the message becomes more in depth. Poverty was killing the little boy long before he got on the train. As most cases, poverty diminishes hopes and dreams, giving poverty stricken people nothing to live for inside and no food from the outside.[5] The little boy had nothing to live for inside except his picture. When poverty is thought of, many do not use deductive reasoning to figure out that when there is no food, no education and no home; hope dies. Not only physically does one die without food, but that person will also die emotionally as well as mentally.[6]

As the story was evolving, many thoughts and ideas developed. A journal was kept to write down any opinions, judgments, contemplations or concerns about my thesis. Approaching the end of finishing the movie, a problem occurred. It was said that the ending of the story gave the viewer no hope. There was nothing to grasp for the viewer to try to make a change. In other words create more of a happy ending. When first hearing the idea it sounded fair to give the viewer a chance. Then realizing after discussing it further, that originally the thoughts about the whole concept of the film, including the ending, were for the viewer to be hit hard with the senselessness of poverty. To take a long hard look at what is happening in this so called "advanced" society. Knowing that it is the filmmakers decision and respecting all people involved and concerned, confusion took place on which ending to use. Then advice was given by animator; Tanya Weinberger, who simply said "go with your instinct." This will be advice I will always use. My first instinct was to go back and read through the journal starting at the beginning. The very first pages were a reminder of all the passions that were involved when the story was first thought up. There were pages flooded with

all the emotions and feelings for homeless children. After that the decision for the ending was easy. The point being the importance of keeping a journal. It is very hard to remember how passionate emotions are in the beginning. With a journal going back reading and re-reading anytime a lift is needed, helps to keep the story focused, fresh and concise.

CHAPTER TWO

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USING TRANSITIONS FOR SCRIPTING

What I did with my story was to examine and dissect it piece by piece. This was done by going over each scene with questions such as; why does this incident happen in this scene? Does it make sense with the previous section and the section that is coming up? Does it make sense in the overall story? Why and how does this section benefit my overall theme of homelessness? Then I go a step further looking not only at the major scenes that I already established, but also the parts in between.

When I first developed my story I did the parts that had meaning and represented significance to my theme. That means I created a certain number of scenes, which are indicated in the storyboard, located in the Storyboard section. In scene 5, where the boy is being confronted by dogs (fig. 1). Looking at the storyboard, if (fig. 2) was the next shot (notice that it is the next scene; scene 6, but not the next shot) right after (fig. 1), there would be a break in the continuity of my story. The viewer would wonder how the boy got away from the dogs and then to the fire. The confrontation with the dog and fire are completed scenes. Completed, meaning that the boy is confronted by the dogs. The boy manages to escape. That dog scene is complete. The boy is confronted by fire, the fire rages up and tries to engulf him. The boy escapes. That fire scene is complete. Although the scenes are complete the story is not yet fully understandable. I need to show how and why the boy went from one place to the next. These are the transitions that give my story continuity.

I began working on developing transitions between each scene. The transitions would consist of two sections. The first called the "what and
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why." The second section is the "how and feelings." I always start my examination with the "what and why." I take one sequence at a time, starting with two scenes, one right after the other. I begin to logically think what is happening in the two scenes. Take the fire and dog scene for example. What is happening? Why does the boy go from one place to the other? If the boy is being confronted by dogs, what is his next move? Then I begin to reason out what cannot happen to him and why it cannot happen. The boy cannot get eaten by the dogs, because in the next scene (the fire) he is again being confronted. He cannot be hurt very bad by the dogs, because the overall theme of my story says that there is no one in the film to help the poor. So the boy has to survive, if he can, on his own. That leaves me with no choice other than getting the boy out of the situation himself.

The second section is the "how." This is extremely important because it works in conjunction with the part called the feelings or emotions." The "how" and the "feelings" coupled together greatly increase the ease of going from one scene to the next. This is because our emotions are a response that causes us to react in certain ways to different situations.[7] I already established earlier in the "why" section that the boy must somehow get to the next scene. So being shocked and just standing there (while the dog pounce on him) is not an option. The dogs decide that the boy is not a threat and leave him alone. The option that I felt was the best transition for my character (from developing him as an entity and knowing his surroundings) was for him "to run." The dogs are so hungry that they bark at the boy when he gets near the food. When the boy runs they are not going to chase after him, because their attention is on eating. Therefore it makes sense that the boy can arrive at the fire scene.

With this transition you can see how limitations of the scene can

develop. Right now all the boy is doing is running. I wanted to add to this scene. So I asked myself, what could I see if I were in a poor neighborhood. I put in abandoned run-down buildings, and some shots of bums. There is more I could have added, but one thing I had to remember was the time limit for my piece. If a filmmaker is not careful, many small details can slow you down tremendously. Each sequence was done throughout the film, with this thought process of scene-transition-next scene (ie: dog-run-fire).

One thing that is extremely important in the development and maturity of my story was knowing my characters. I learned that it is equally important that objects take on humanistic feelings and emotions. How a ball rotates when it is thrown so many miles per hour, by a baseball pitcher, must be believable. In writing and animating my story, analyzing scenes, logically thinking out the transitions and researching the actions characters would or would not not acquire were ways in which I developed my characters. I decided my story would show the boys' environment. How he grew up was so tough, that he really was a boy without a childhood. His mother trying to put food on the table is serious; the boy being young, poverty stricken and a runaway is serious, therefore I had to definitely develop my story so that it appeared to be believable. I feel believability is what makes an animation work.

CHAPTER THREE

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MODELING

A friend of mine, speaking about our computer and its' modeling capabilities, said, "If our thoughts are so much greater than the capabilities of our machines, so that our creativity gets hindered, then maybe a different machine is needed." If you think about that statement, does it mean that we hide behind excuses? It is easy to say that the computer will not let us do that, or this computer is not good at creating organic shapes (famous Topas saying). I believe we should accept it as a challenge to find new ways to express what we wish to say within the confinements of the computer. I am not saying my friend was wrong in the comment made, in fact there is a lot of truth to the saying. But by working with this particular system, I found that not trying all angles to get what you want, will get you absolutely no where. I feel there are two basic rules an animator follows to build a model. One is the image he or she holds in their head. Second, is the ability of your computer to build that model. With these two stepping stones plus an imagination, I feel one can accomplish almost any idea on any systems.

Although many animators feel that it is not possible to create an exact replica, three dimensionally, of a human figure on the systems of today, many close attempts have been made.[8] "There is not a system made that will create skin of a human being or gestures that are as complicated and exactly like that of a real person. Nor can it do the folds or the movement of clothes when a person moves."[1] Programmers have yet to build a system, but all

[1] Tom Calvert, "The Challenge of Human Figure Animation," Human Figure Animation: Approaches and Applications Siggraph Collection Course Notes, Dallas Convention Center: 1990, vol. 8, pp. 3-8.
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these problems have not stopped animators from creating lifelike figures to express their work. Depending on the animator, a single stick figure could be representative of a human figure. Allowing the viewer to relate to the movements of this stick figure as human movements.

My models were built on a 386 Compaq computer using Topas software. The figures were created using splines. Each part of the body was built separately from the other part, then grouped and attached together. "Eyes are by far the most important part of a facial model. It is important to have the specular reflection spot (highlight) fall within the iris of the eye. This not only makes the model look more convincing, but it brings the character to life."[2] In my film I made sure that the lights were always reflecting in the eyes, especially of my main character.

"Ears become a major problem. This is because of their degree of surface curvature compared to the rest of the head. If modeled to be realistic, many problems arise. The amount of data needed for their detailed curvature becomes inversely proportional in their importance to the overall model. This would slow down rendering times with what might be considered unnecessary detail. Also a more detailed ear may draw attention away from the face."[3] There are a few different ways to correct the problem with the Topas system. One way is by taking a polygon making it a simple outline of the earlobe and extruding, thereby changing it from a 2D object to 3D. Another way is to take a mesh and pull the points to the shape of an ear and attaching it to the head of the model. Another way is to create a spline based

[2] Steve DiPaola, "Facial Animation Notes; Implementation and Use of A 3D Parameterized Facial Modeling and Animation System." State of The Art in Facial Animation Siggraph Collection Course Notes, Dallas Convention Center: 1989, vol.26, pp. 66.

[3] Steve DiPaola, "Facial Animation Notes; Implementation and Use of A 3D Parameterized Facial Modeling and Animation System." State of The Art in Facial Animation Siggraph Collection Course Notes, Dallas Convention Center: 1989, vol.26, pp. 67.

object using cylinder, CS model or surface revolution to get a full 3D appearance when the ear is completely rotated by itself 360 degrees. I chose to make the ear the simplest way by changing the polygon from 2D to 3D. This would cut down my rendering time, thereby increasing productivity to complete my thesis. The ears also were done this way because my models are not attempting to be exact duplications of the human figure, but merely representations of the human species.

The points of the facial areas are manipulated to create different characteristics so that one could distinguish a woman from a young boy and so on. The head of the models were built with the eye sockets, nose and mouth already in place (fig. 3). The eyes on the models were created by using spheres. The head was created by using surface revolution and the ears were simple polygon shapes extruded (fig. 4). To finish off the look, eyelids and hair created with a mesh, were placed on the models (fig. 5). The clothes formed how the body should be defined relative to the characteristics of each model. For example, the dress the woman is wearing is not covering the body, but it is the body (fig. 6). The reason the bodies were built this way is because it is difficult to animate clothes. It also is less time consuming and the computers memory capabilities were very limited. When rendered, the illusion is that there is a body under the clothes (fig. 7).

In modeling, many different techniques were used to create credible characters and surroundings. In the first scene a black and white image was digitized into the Tips program using colors from the palette to enhance the photograph (Tips is a paint package which comes with the Topas 3 Dimensional package). A tinted wash was then used to give the picture an overall soft look. The picture was then textured mapped onto a rectangle in the Topas program. Giving the picture an illusion of a real color scene. The

inside of the train including the train door were made in Tips, then texture mapped onto parts of the train that had been cut, trimmed or drilled. The boy was scaled down and put in the train. The boy is holding a picture of the family with the circus train in the background, which was also created in the Tips program. The picture does not automatically appear in the Topas program, even though they can come as a combined package. The picture must first be saved in Tips as a picture file, then quit out of the Tips program and opened up into the Topas program as a picture file. Once placed in a buffer that picture can be a background or texture mapped onto an object or polygon. I projected the picture of the family, onto a rectangle the boy was holding to represent a photograph. The mothers' body was also mapped from a texture created in Tips (fig. 8).

Because of the complexity of some of the scenes, overlapping models were placed into picture backgrounds in order to have all the imagery seen. An example is in the kitchen scene showing the mother, the father and the babies. First a model of boxes, a sink, the table, the garbage on the floor and one of the babies were created. This image was fully rendered, then it was saved as a picture file (fig. 9). Next the father was modeled. The first picture file was brought in and texture mapped onto a rectangle that fit the dimensions of the screen. The father was fully rendered creating the first overlap. The scene was then saved as a picture file. This picture file was then texture mapped onto a rectangle that fit the screen and the objects that are actually going to move in the scene, the mother, baby and the plate, were added. So now instead of having all of the objects in three dimensions the only objects that truly are, would be the mother, the baby and the plate (fig. 10). Although only the mother can be animated, I still keep the look of fully rendered objects appearing to be 3 dimensional (fig. 11). If the father

needs to move, I would have to first render the mother and save the picture. Then the father is the only functional 3D model in the screen. This overlapping method saves on render time for the model, memory as far as space on your disk and also it saves on the amount of objects that are allowed on the screen; having to do with the amount of RAM your computer holds. Therefore your animation time is cut drastically and the render time out to the optical disk is shortened. What may have taken 24 hours to render onto optical disk now may take 10 hours. Some scenes had more overlapping then others and some scenes had none.

CHAPTER FOUR

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ANIMATING

"For animation in science, the major goal is the simulation of what really happens; movements should look the same as they do in real life. In entertainment, communication comes before realism: traditional animation skills become important."[4] The makings of human character animation are limited only by an animators imagination. Glenn Entis, the vice president of production from PDI, feels there are three major credibility issues in character animation. "Does it look like the character, does it feel alive and does it feel like it is really in the scene."[5]

What is the goal to creating a 3D computer animation? "If the goal is to accurately simulate a human being, then facial animation, as well as everything else is important. But if the goal is to tell a story with simple characters, then expressive body and head motion are more important than facial animation."[6] Let us take realism and simulation versus animation. "An animator that tries to create an exact replica of a 3D realistic human face that is a little off, will receive strong critical reactions from viewers. Many animations require that the faces be believable in a story. The audience

[4] Frederic I. Parks, "Parkes, "Parameterized Facial Animation Revisited; Realism and Simulation vs. Animation," State of The Art in Facial Animation Siggraph Collection Course Notes, Dallas Convention Center: 1990, vol. 26, pp. 50.

[5] Glenn Entis, State of The Art in Facial Animation Siggraph Collection Course Notes, Dallas Convention Center: 1989, pp. 50.

[6] Bill Reeves, "Simple and Complex Facial Animation: Case Studies," State of The Art in Facial Animation Siggraph Collection Course Notes, Dallas Convention Center: 1989, vol. 8, pp. 91.
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should be able to establish an emotional relationship with those characters portrayed."[7] With a simple facial animation, there are three features that should be applied. "Good body and head motion, good eye motion and good mouth motion. No matter how much detail you put on the face, without any head motion the model will not seem alive. By adding a sway or bob to the head the model suddenly comes alive."[8]

Human figure animation is nearly the biggest challenge in animation.[9] Since making a character walk in animation can vary, I decided to use a method which takes the rotational axis from the feet. Starting with one leg, I selected a foot as the master object. Then I attached the bottom part of the leg as the subordinate to the foot. I then selected the bottom part of the leg as the master object and attached the upper part of the leg as a subordinate to the bottom part of the leg. This was done for both legs. Both legs were then grouped together. The eyes, hair, ears and eyelids were grouped to the head. The head was then grouped to the upper half of the body and then grouped to the legs. Arms were attached the same way as the legs starting with the hands as the master object. To walk I selected the foot to rotate forward. The other leg would get rotated backwards the same amount of degrees and placed in front of the forward leg connecting at the top of the two upper legs (at the hips).A bend in the foot, lower leg and thigh were added along with more keyframes, depending on the style of walking my character was doing at the time.[10] Arms would move in a similar manner, then the body would get placed over the legs and in between the arms. I must admit if

[7] Frederic I. Parks, "Parkes, "Parameterized Facial Animation Revisited; Realism and Simulation vs. Animation," State of The Art in Facial Animation Siggraph Collection Course Notes, Dallas Convention Center: 1990, vol. 26, pp. 50.

[8] Bill Reeves, "Simple and Complex Facial Animation: Case Studies," State of The Art in Facial Animation Siggraph Collection Course Notes, Dallas Convention Center: 1989, vol. 8, pp. 91.

I had used the grid in Topas, to keep moves in registration, things would have been easier. It would had saved me the trouble of not having to redo some animations over and over to get it right. "Not only are human bodies more complex than any other object commonly animated, but as humans, we are uniquely sensitive to even the most subtle movement patterns of other humans. Thus we are very critical of both the patterns of movement and the way in which the body changes shape as it moves."[9]

In order to see objects that are animated I had to set the animation to either a preview or a full render. The preview allowed me to check the parts on my models so that no hands were going through the tables or that hands were connected to the arms. A full render takes twice as long as the preview mode, but it would allow me to see shadows or transparencies. This mode will be how your final output will look, so it is always good to do a full render of each animation. For me to see how the animated movement would look in real time, I would use a real time preview. What the real time does, is allow me to see movements, in wireframe, to the precise timing of the final animation (in more than half the amount of time it would take to view in the preview or render modes). It also provides the exact time the animation will run, when I do final output to the recorder. The full render mode and the preview mode have the ability to let me see a full image plus movement, by using a flipbook. But using either of these two modes does not give the real timing that will be the final outcome. Only real time mode will give this information correctly.

After everything is animated I rendered the animation onto an optical memory disk recorder. An optical memory disk recorder (OMDR) or a laser

[9] Frederic I. Parks, "Parkes, "Parameterized Facial Animation Revisited; Realism and Simulation vs. Animation," State of The Art in Facial Animation Siggraph Collection Course Notes, Dallas Convention Center: 1990, vol. 26, pp. 50-51.

disk allows me to record my animation frame by frame. I then transferred from laser disk to 3/4 inch tape. This format of tape gave me the capabilities to edit easily and does not take away from a good quality picture.

It takes a lot of time to build models and create the animation. Sometimes it can take ten hours to build models or create an animation. Sometimes it could take a half hour to do both. Another time consuming process is waiting to see how your animation looks once you have it ready. Doing a full render of a flipbook will take some time. This is shortened by skipping frames to get the gist of how the action is flowing. I could see movement by going to real time where the computer will take a shorter time to give me an output. But the longest hours by far are spent waiting for the full render out to the OMDR. This takes the longest amount of time in comparison with everything else. For an animation that is three seconds long (with average model in the animation; not too complex, not too simple) it would take 15 hours to complete. In total my animation is eight minutes and twelve seconds, with mostly complex models; that is a lot of rendering time. As of now the OMDR cannot allow you to record over what you already have recorded on. At $170 dollars for 15,400 frames of space, plus the amount of time that goes into waiting to see the result, you need to make sure the animation is perfect before you do the final recording.

CHAPTER FIVE

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EDITING AND SOUND

After recording to the OMDR, I transferred the image on to 3/4 inch video. This format was chosen so that the clarity would be sharp and it could be easily shown to others. The reason I needed to dump the animation to a different format was so I could edit the scenes and be able to put them in the right sequence. Some of my scenes were animated a bit faster then I would have preferred. This is when I decided to record on a OMDR that was equip with fast and slow speeds. With this player, I was able to calculate exactly how fast or slow I wanted the animations to go. This was a huge time savers because it allowed me not to have to go back and re-animate and re-render some scenes. Once I had all my scenes on tape the hours of editing began. I started by writing down the order of animations. I then rewrote the order with all the placements of where I needed to cut from one shot to the next. I numbered each shot starting with 1 and ending with 75. I then broke up the shots into seven scenes, so I could concentrate and give each scene my full attention. The first scene is the opening title to the zoom in of the abandoned building. The second scene is the shot of the boy looking over at the parents to the time when the boy exits the apartment. The third scene is the dog scene. The fourth scene is the fire scene. The fifth scene is the boy running through the silhouetted city. The sixth scene is the boy laying his head down in the train. The seventh final scene is from the approaching train to the credits. I wrote each scene on a separate piece of paper, but kept the numbers (1 to 75) in tact. For example, the first scene was 1 to 5. The second scene was

5 to 21 and so on. This was so I could do each scene completely, but not forget that it is only part of the story. It took me approximately 45 hours to edit the video. This is because when I thought I had the final edit very close to completion, I found out that sound made me have to go back and re-edit what I thought was already a good edit. My teacher saved me from doing a complete and final edit. He kept saying wait to you get your sound. For some reason I could not understand why I had to wait. But I understand now. It saved a lot of re-editing.

Doing sound was a major task. Only because I originally decided to have someone else do it. But when I found out (because of financial difficulties on my part) that I had to do the sound myself, it turned out to be just as hard as I thought when I wanted someone else to do it. Originally I planned blues music for the piece, but I began listening to other types so I would not limit myself. I have a bunch of CD's and just started listening to every song on each CD. That took almost two days straight. I listened to R&B, Jazz, Blues, Classical Jazz and Classical. I then started listening to my roommates' CD's which were made up of Rock, Pop and New Wave. After many different types of music, I ended up with something I would have never picked off the top of my head: Classical. For the first slow scene I picked a traditional spiritual off the Wynton Marsalis CD called "Sometimes I Feel Like A Motherless Child." This song was perfect for my piece, even down to the title. This covered all the slow scenes in my film. The three other songs were off the same CD. These were used for the fast, angry, frightened, suspenseful parts of the film. Financially, things started tobecome very clear to me that getting all original music was not in my budget. That made me have to rely on copyrighted music. I wanted to state here that this film is a definite student film and will not be used for profitable gains. This is

because I did not get the permission from the people who wrote the music that I selected. By law someone cannot use any music produced by someone else without that persons' permission. But using the music in a student film is permitted when no profit is involved.

Once I got the basic music, I started watching regular and animated movies a lot closer to see how they used their musical scores. Most of the time they used the same music over and over in different keys or tones throughout the piece. This seemed to create the importance of that particular sound with the overall theme of the piece. Some movies identified the character by that piece of music. Music was also used to identify the emotions of the characters. Music was used in many complicated ways. I knew my piece would be approximately 8 minutes long, so I did not want to get too complicated with the music. I also needed music that was not very long and had many down beats (for fading out). I had six music changes in eight minutes (slow, fast, fast, slow, fast , slow) not counting the credits. The type of music I picked helped me immensely in this area. This is because many classical songs can be comprised of two songs on one track, therefore making the songs short in length. Some songs on the CD were one minute, some were three. This type of music is excellent for animation. It is made up of so many ranges, that it is easy to match up or fade out at close to the time you want.

I originally planned to use blues music for my piece; it may have worked, but I do not feel it would have been as effective. My animation is based in a poverty setting. It does not look like the average computer animation. I felt like the music, compared to how the imagery looked, gives the viewer an interesting unexpected tense feeling. I do not think the blues music would cause the same affect. With the blues music, instead of being

tense, the audience may have been too relaxed and passive.

I then watched cartoons closely to see how sound effects played a part in movies and shorts. Once I got an idea of what role they played, I took my editing sheets of paper and wrote down every sound effect I would need for each scene. Thirty sound effects later I went into editing. Something told me to lay some music down just to see how the piece would look. By the time I finished I realized I only needed about six of those thirty sound effects. The music I choose made many of the effects not necessary.

Another problem I had, which I talked about briefly, was the video edit. I already had the video edit close to completion. Matching the sound to fit exactly to the scene proved to be difficult in some cases. When they did not match up, I had to re-edit the video to make the music fit. Once in a great while I could edit the sound by trying to match like sounds together. I learned that editing the video is ten times easier.

CHAPTER SIX

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TIMELINE

To say that this 8 minute 12 second animation took me 8 months or 1 year and 5 days to complete, would not be the truth. In understanding the experiences behind finishing a project of this magnitude, I have to share many ups and downs during the past two years. It was difficult to work on this project and continue working straight through. Without sharing this chapter on time, I feel that there would be a large missing piece in this thesis paper.

I first began in the winter of 1990, writing and revising the script. I had it approved by the spring of 1990. I decided to stay at school for the summer quarter and continue with modeling my characters. We had great difficulties with the computer. My story had been approved, but since this type of three dimensional animation was very new, no one really understood how much memory the machine needed to run complex modeling. With only 8 megabytes of ram, I started to work on the head and body of my figure. I tried to put the head in the same screen as the body, but it just was not enough memory. All summer I worked and reworked the models parts so that all of the sections could fit on the screen. I discovered that decreasing the number of polygons and changing surface revolution models to CS models, enabled me to fit all the parts on the screen. I realized at this point that two models could not be operational in a scene at the same time. This was a problem, because there were confrontations in some scenes where there are two of these types of models in a room together. I reworked my story, but not to the
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extent of removing any models out of the scenes. I discovered a technique called overlapping (which I explained in the animating chapter) that enabled me to have as many characters as I wanted in a scene. I had another problem which also had to do with memory. My model, to fully render, took approximately 25 minutes for the head and a total of 40 minutes for the total figure. Painfully long if I were to do a 8 minute animation using not only one of these models types but three.

In the beginning of the fall quarter the program upgraded the memory from 8 to 16 megabytes and installed a rapid render board. These changes allowed me to add objects in the same scene as a figured model, having them all remain 3 dimensional. I still could not put two figured models in the same scene and keep them 3 dimensional. A big improvement was the rapid render board. I cut my rendering time more than in half. Instead of 25 minutes to see a full rendered head, it took close to 8 minutes. Plus, with the upgrade in memory, the head now took 5 minutes.

While I was working on my thesis, an operation for my jaw was to take place in August of 1992. I was going home every 5 to 6 weeks to get my mouth ready for surgery. I would only stay a couple of days each time, but the traveling 9 hours to get to my house down and back, took its' toll. In the sixth week of the fall quarter, I came down with some sort of throat infection. I could not swallow. So I could not eat. I got fevers and even blacked out. I was told I had one of the many flu viruses floating around and there was not too much anyone could do. I got worse. I was not able to cook my meals and eat. My problem was I did not eat right before I got sick. I was so wrapped up in my thesis, along with having two jobs on the side, that the vending machine became my breakfast, lunch, dinner and snack. I went home to recuperate. My mother fed me three square meals a day. While I was home

I improved, but I still was not 100%. I was very depressed to be home doing nothing, knowing that my thesis was not finished. My mother suggested I take on a little job to test the waters and see if I was strong enough to go back to school. I was feeling okay. Plus knowing I would be returning in the spring when all the winter flu would be out of Rochester was a big help. This is when another problem occurred. I was driving home one night about 5 pm and stopped by the mailbox to pick up the mail. This is something that happens everyday. I had a small dog named Jo-Jo. Everyday she would come around the car when we would pick up the mail. We would get the mail, slowly move the car up about 40 feet to the driveway and she would trot out of the way. For some reason she did not move this time. Without going into details of exactly what happen or how it felt to hit her, or take her to the hospital; I will just say that I had her since she was born. I had her mother as a pet and watched Jo-Jo being born. Two days later I had a near head on collision with a van. Not saying that I missed the van, we did hit; headlight to headlight. I was not hurt, but I never had an accident before. It was my mothers' car which made me feel ten times worse. It was also around this time that my family found out that my mother had a stroke 3 years ago; that was never detected. The stroke was the cause of a lot of her problems she has now and it was discovered 3 years later. With all this happening, I was greatly affected, not only physically but mentally. It took me from the middle of fall quarter in 1990 to a couple of weeks into the spring quarter of 1991 to be well enough to come back and continue with my thesis. Something that was so silly as to not take time to fuel my body set me back approximately 4 1/2 months of work.

I started back a couple of weeks into the spring quarter. Topas had been upgraded once again, more memory was added. My models' head now took 3

minutes to fully render and the total figure took 5 minutes. I had completed my "father" model and some backgrounds back in the fall quarter. I just finished my "mother" model and the "babies" when the computer broke down for 2 weeks. I worked through the rest of spring, summer and most of fall of 1991. Within this span of time, the computer was down a total of 7 weeks. Also there were times when the school closed the facilities at the end of each quarter. By this time all my major models were complete along with most of my backgrounds. I started animating at the end of the summer. Everything was going along great. My only disappointment was that I lost those 4 1/2 months. But things were looking good. I ran into computer problems of course. For instance, I found myself redoing backgrounds. Because the continuity did not flow from one background to the next in some scenes. This was caused mostly by the lighting. If from one animation to the next the lighting is off, it will look like a completely different scene, when it should be one continuous scene. In the computer there is a completely different logic to completing scenes. Mainly because of memory. The computer will only let you see so many keyframes at a time and then it crashes, because of lack of memory. There may be too many objects in one completed scene or the animation is too long. So you cut the scene in half, overlap or both. What needs to be remembered is to save the screen and its' properties. A different screen automatically goes to default lighting and you would have to manipulate the lights each time. Making both scene look continuous. Lastly, you may want to see the first part of your animation and make sure it is right before you complete the whole piece. It is a waste of time to render the complete animation and find out that it is not what you want.

I found great gratification in problem solving ways to complete my thesis. At times it was distressing because no one knew the package; not the

teacher, not the students. So any questions I had, I basically had to figure out for myself. Which I did not mind, except when I would run across very simple parts of the package. Parts that would have saved me so much time if someone had said, "oh just push this or pull that point." Figuring out the little in's and out's of this program gave me just as much difficulty as the greater parts of the package. The only difference was that figuring out the significant parts were fun, while the little in's and out's were just frustrating. As it started to come nearer to the end of the fall quarter of 1991, I decided that I would try to finish my thesis by the end of winter or beginning of spring, 1992. I had a couple of weeks left to go in the fall when my father had a heart attack. A couple weeks later he had another one. My mother who has had diabetes since 1983, was so upset after the second heart attack, she did not get out of bed. Then when she wanted to get up she could not by herself. When I arrived home I found out that my father had been pronounced dead twice. With both parents ill, I had no choice but to stay and take care of them. From November of 1991 to the end of winter quarter in 1992, I stayed home and got things back on track. After my parents got better I decided to come back in the spring of 1992 to finish. Since I also had major car trouble back around the end of fall quarter, I returned with no car. Getting on one bus and transferring to another, it took me one and a half hours to get to school. Many times were spent overnight at school because the last bus leaving was 9:41 pm, while the labs stayed opened until 11:00 pm. From the spring of 1992 through the summer of 1992 I finished my thesis, paper and demo reel.

This section to me is probably the most important bit of information I could share with someone. It speaks of the fact that no matter how well you plan, many unwanted situations can prevent you from reaching your goal. I do not believe that leaving out some of the things that personally happen in

life, that affect your work, should be left out. This is true in many graduate programs. The paper is just the facts and conclusions. Many of the problems and experiences you encounter while completing your thesis, may add to your work. So when they are left out, the reader does not receive a total understanding of the experience.

CHAPTER SEVEN

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CONCLUSION

Homelessness is shocking. Many people try to disassociate themselves from the homeless. Not because they can visualize themselves homeless, but more so because of what homelessness says about the society we live in. Many people are in shock, thinking that poverty is only supposed to be a problem in third world countries.[11] What most do not realize is that many babies and young children have become increasingly homeless in the last decade. Teen pregnancy and drug use are the two main reasons for this increase.[12] I believe it is important to realize that the homeless person is a real human being with the same emotions and feelings of a non-homeless person. The longer a person stays on the street, the greater the loss of self is increased.[13]

There are many steps in completing a thesis project. With the thought process, there is the development of style and how you want to tell your story. Along with the techniques that would be the most beneficial. Surrealism was the style used in my piece. It is very beneficial when creating a film to make sure all the steps of your thought process are painstakingly thought out and followed. Once everything I wanted to say was outlined for my story, I began to tie the scenes together using transitions between each scene. This was done so the story would have continuity throughout the piece, making the animation more believable.

In creating the models for my film, I realized the difficulty of trying to build human-like characters. There is not a system that I know of today to replicate the exact movement of clothes or facial gestures, yet there are many
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ways to represent human characters simplistically; stick figures are a good example. I did learn a valuable lesson in using the Topas system. The lesson was; although building the models may be difficult, accepting the problem as a challenge and solving it, is worth the trouble. No matter how much detail you put on a model's face, without any head motion the model will not seem alive. Good head, eye and mouth motion are the three elements needed for a simple facial animation to be believable. My models are equipped with eyes, eyelids, hair and ears. Nothing else is on the head.

In animating each of my models, I made sure that there was a lot of eye and head movement. In animating the body each limb had to be lined up exactly in order for the animation to look smooth. We as humans are extremely critical of the movements with character animation, yet animating the human model is by far the most difficult of any other computer object.

After the story was written, the models built and the animation finished, the sound needed to be added. In learning about sound and editing, I am glad I did not tighten up the animation as much as I could have. Because I later found out that the sound changed the pace of some parts of the animations. Once I recorded the sound, the animation was laboriously sync up with the music. I first thought of using a "blues" type of feeling. Later I decided to use a classical sound, because it was much more interesting in that it created more intensity and forcefulness. I did not feel I could have delivered the same "punch" with the "blues" sounding music.

Completing my thesis did not happen the way I planned. Many unexpected problems, out of my control, occurred. This forced me to take much more time to finish. I felt that sharing my experiences of only the discoveries pertaining to my work on the computer, was not truthful. The problems that occurred, directly affected my work. It should be understood

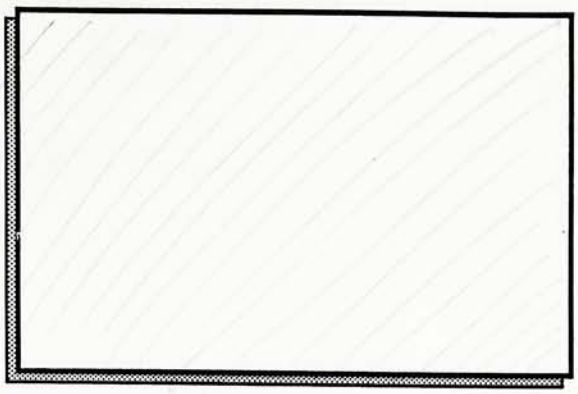
that situations happen that can throw you off your path. I feel that many people start out to do a thesis, do not picture in their minds that problems can happen and inhibit or even stop the progression of work.

Overall, I feel that computer animation has an enormous future for animators. I set out to prove that 3D animation can express a real issue and I feel through my experience this has been achieved.

STORYBOARD

Scene 1

1



Black screen
Full Image = 2sec.

2

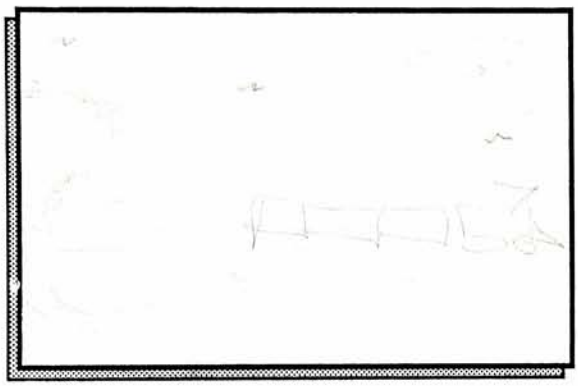
White title Zooms in
Black Bkgd.
diss. up = 2sec.
Full Image = 3sec.

3

Title slowly dissolves out while first scene wipes ON screen. Right to left
diss out = 5sec
wipe = 7sec

4

5



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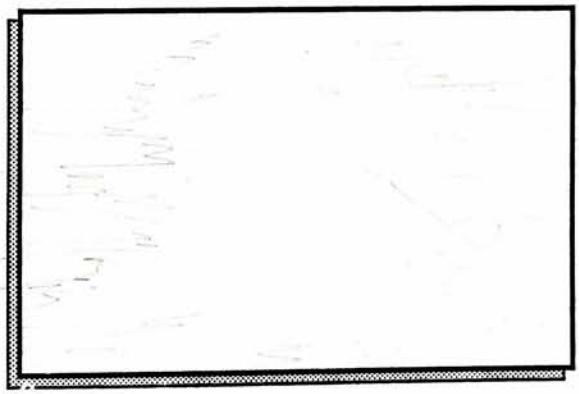

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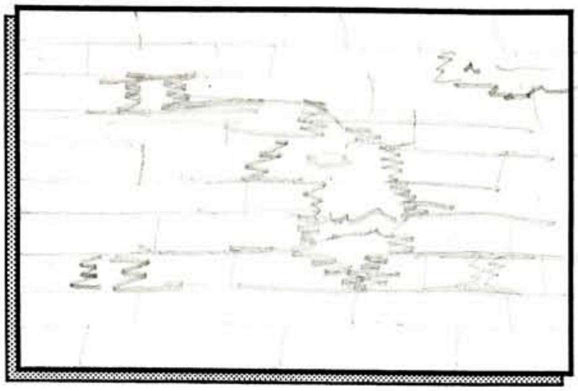
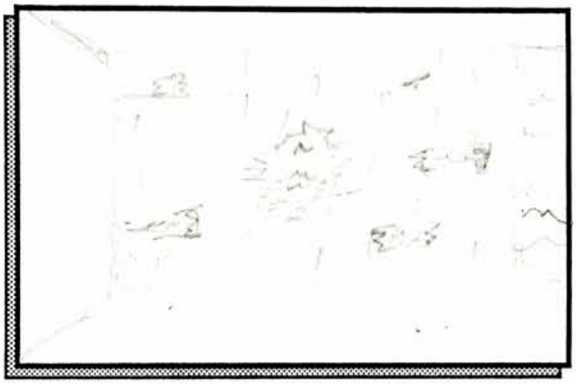


Continuing zoom

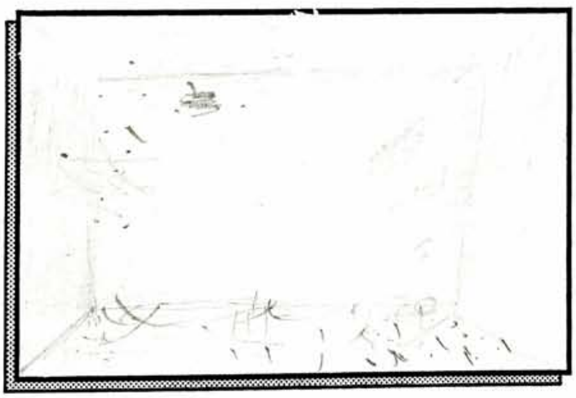
8



Zoom stops

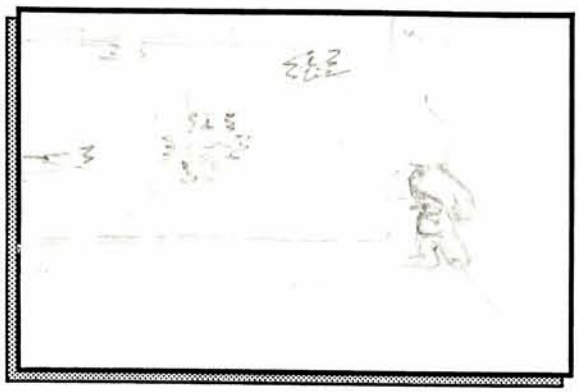
Camera pans simultaneously as zoom discontinues

9



Camera cont. to pan slowly around room - shown here is the Room @ 180° from beginning of pan

10



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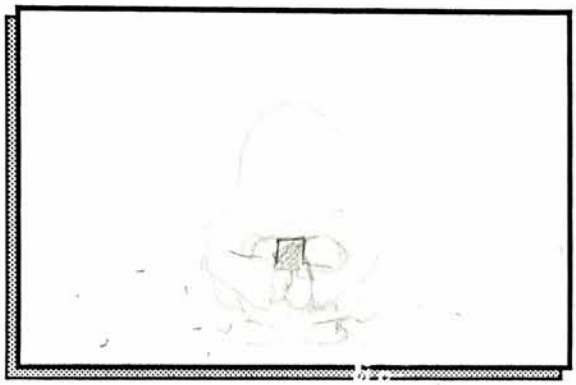

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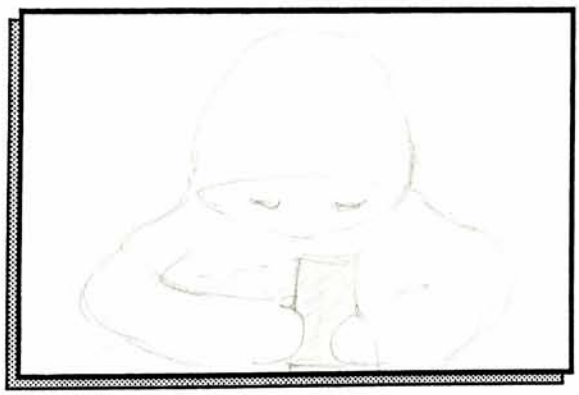


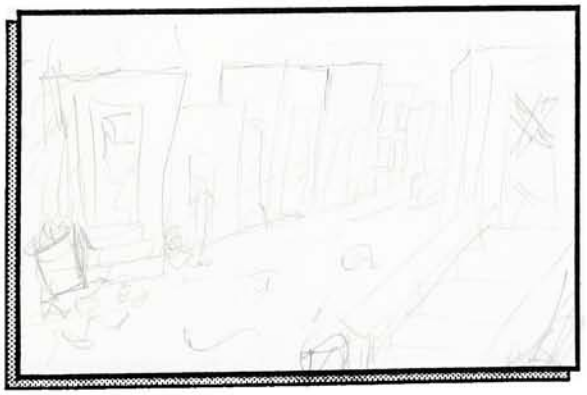
13

Sniffling Sound

14

Scene 2

15



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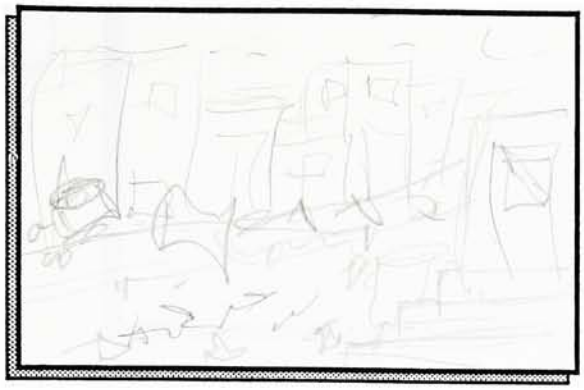
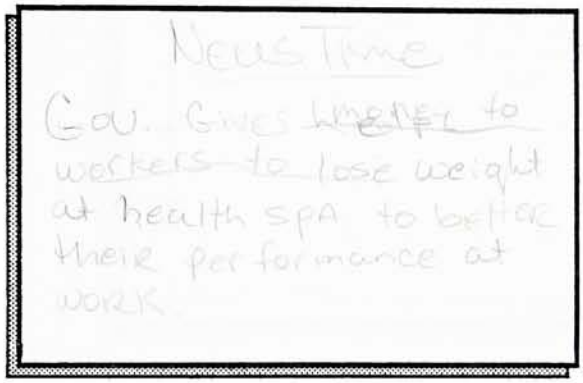


Wind

Wind sound

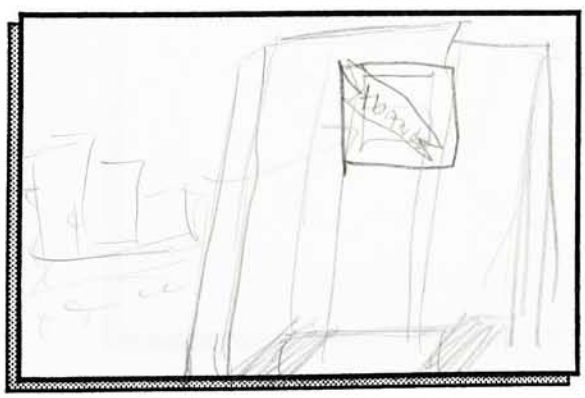
17



News

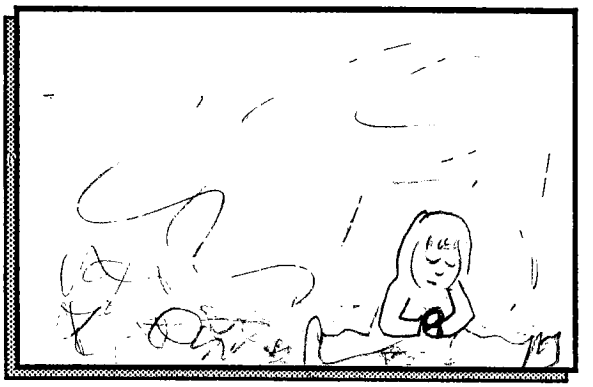
Feel back paper sound

18



Scene 3

19



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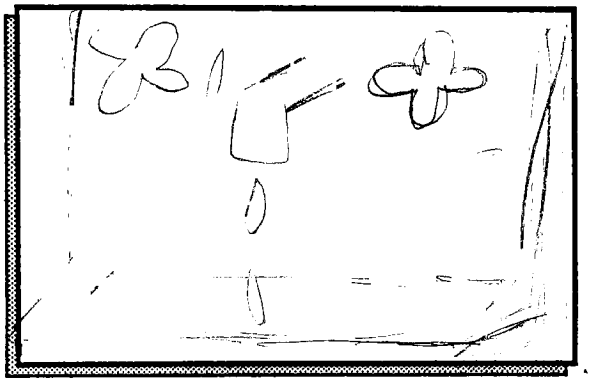
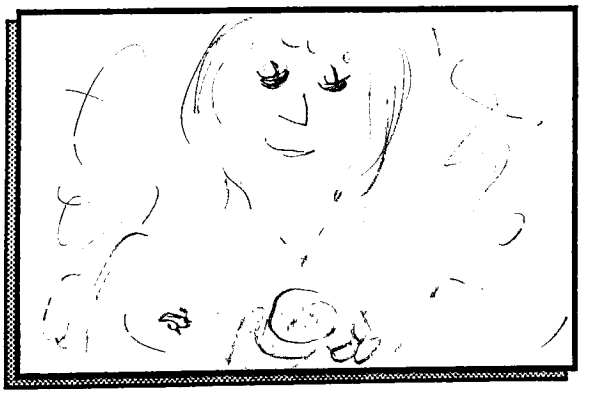


Cut to : dripping

tapping sound

21



Tension increases

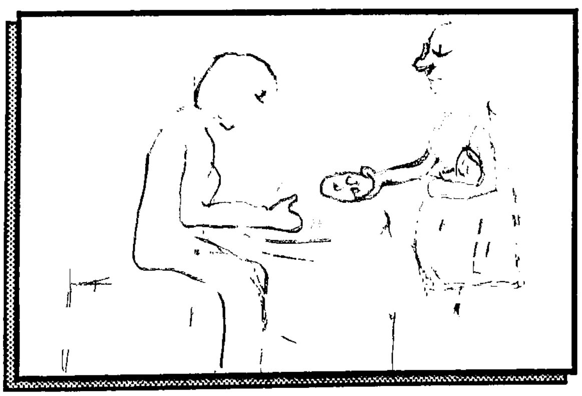
[illegible]

[illegible]

23

... to close up
of MAN'S hand
tapping ... back
forth ...
[illegible]
[illegible]
Tension.
Sound aggressive music slowly
fades up.

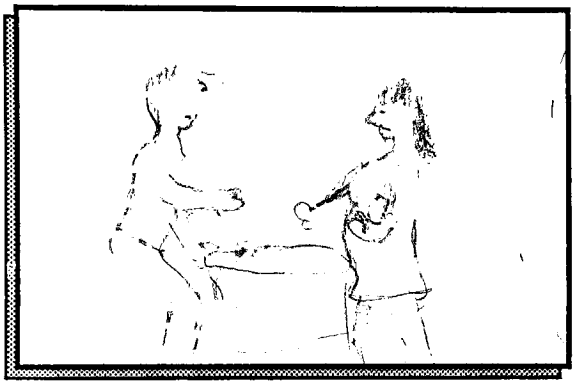
24



Cut to ...
[illegible]
(...
him)

25

26



CU of

27

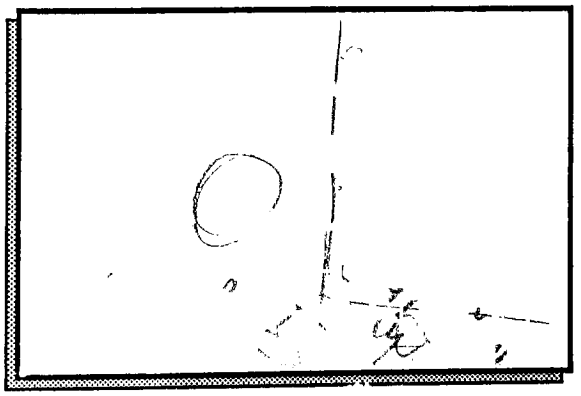
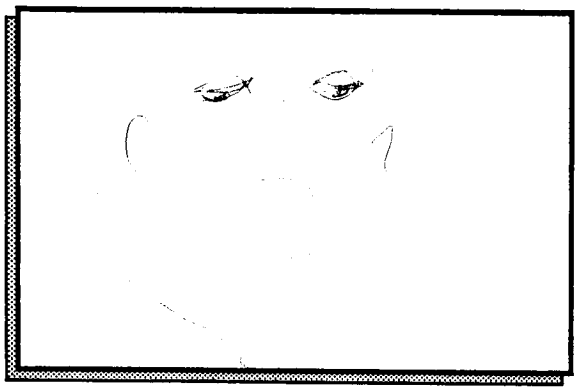
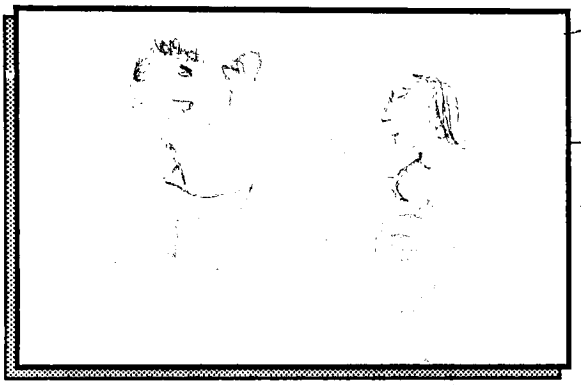
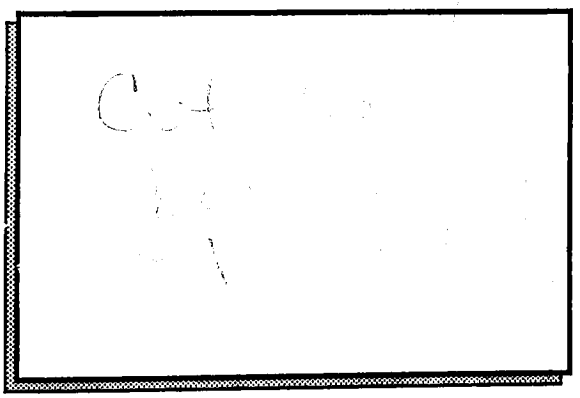


plate smashing sound







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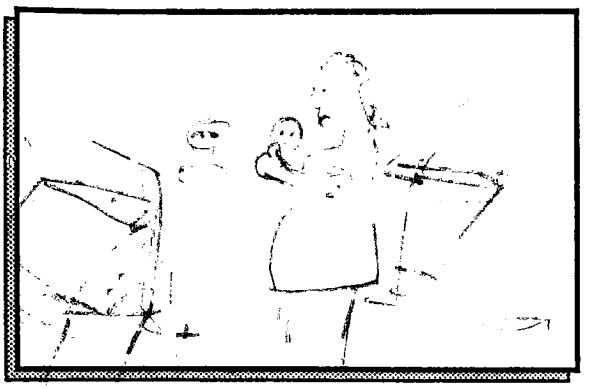
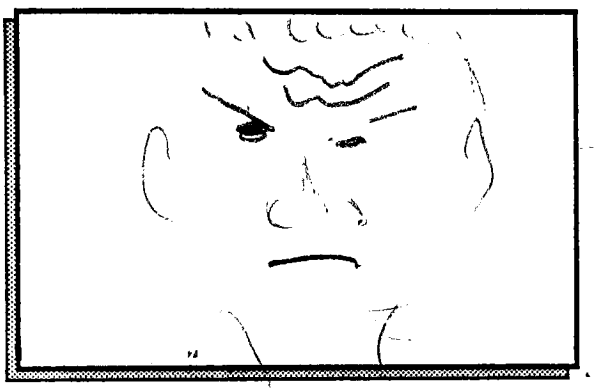


33



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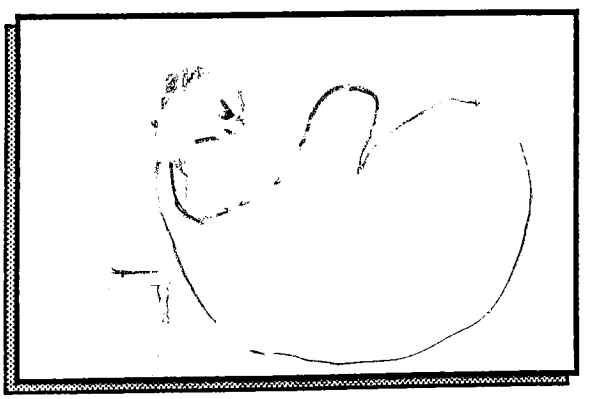
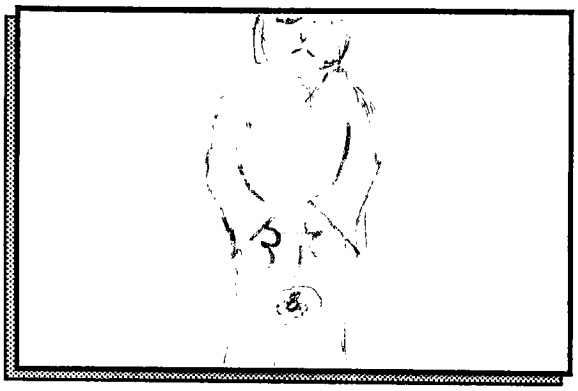
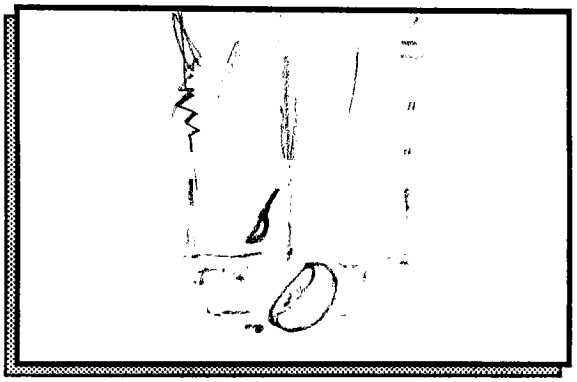
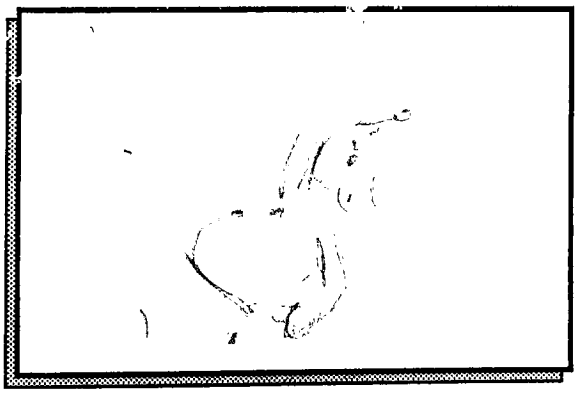


SLAP is heard



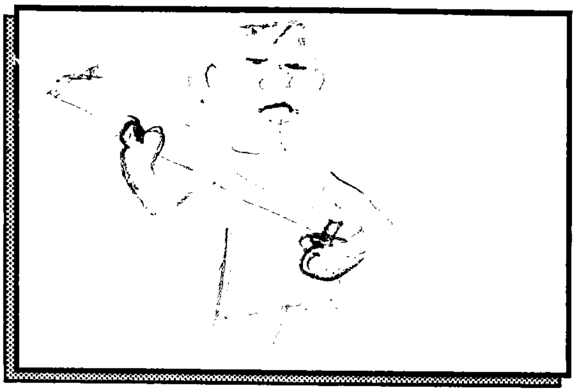
motion



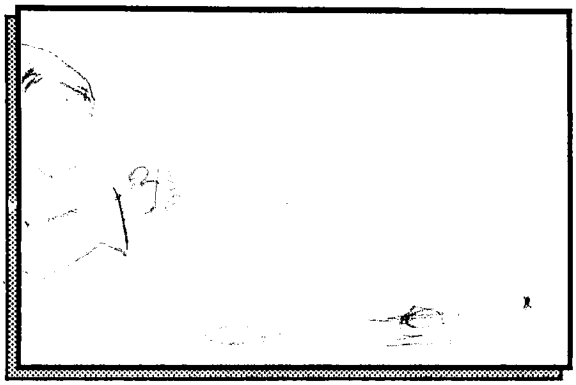


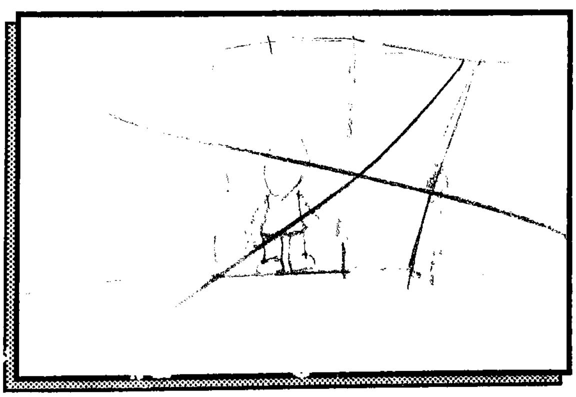
series of slaps & falling as the man is beating her

woman screams distorted

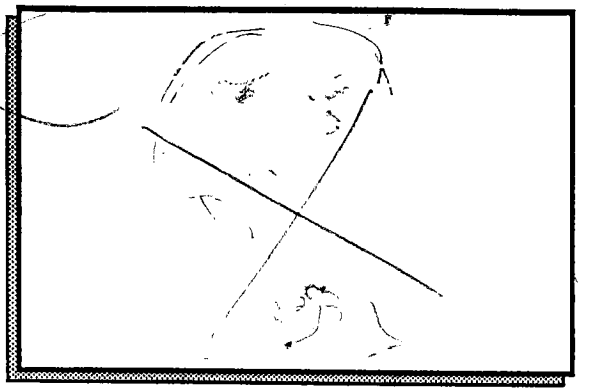


K + walk [illegible]
[illegible] woman



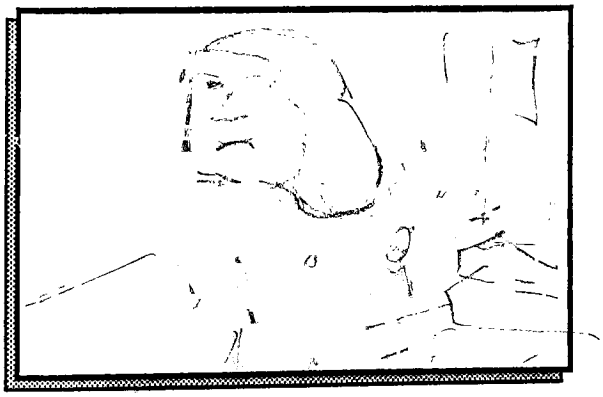


OUTSIDE



Scene 4

40

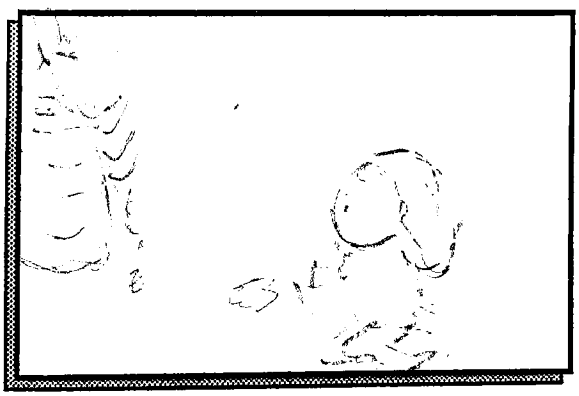


41

Cut to scene

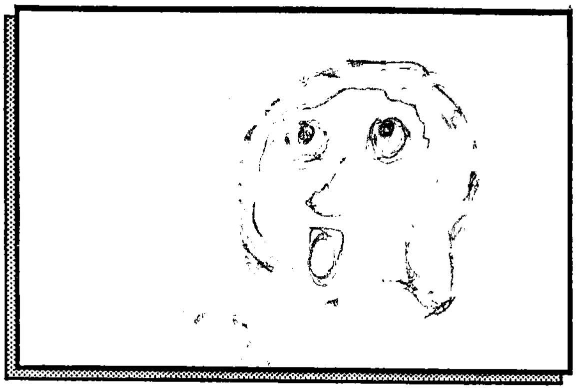
fig. 1

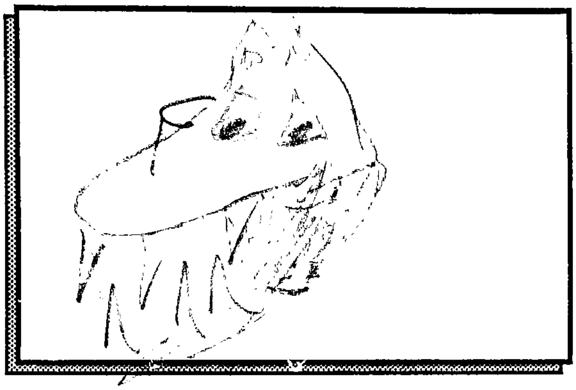
fight



sees

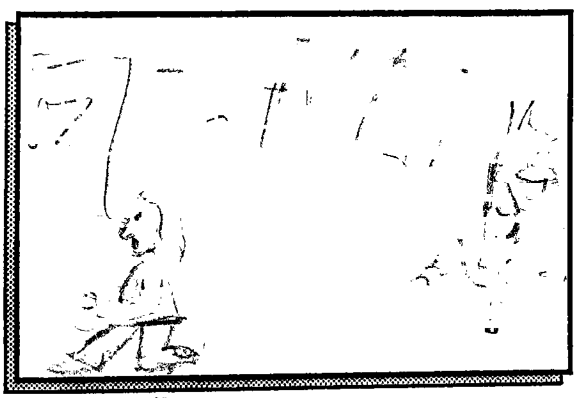
44





Dog Growling

4



fast paced music

4

Cut back to boys face

~~Scene 2~~

1.8

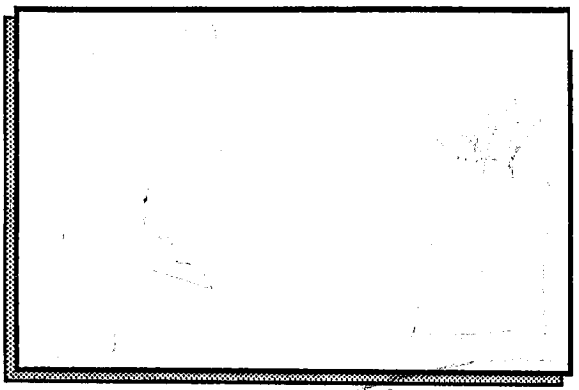
to
little boys tight fr[illegible]
bldg.

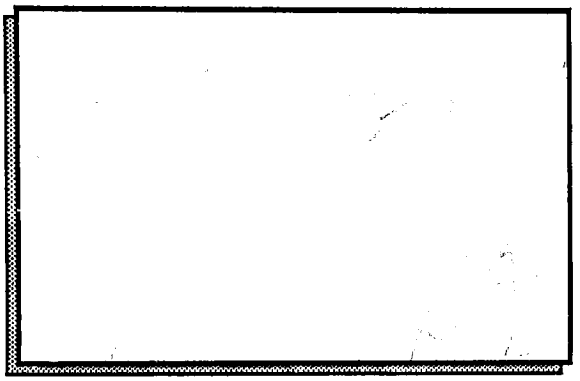
Cut to shot of boy running

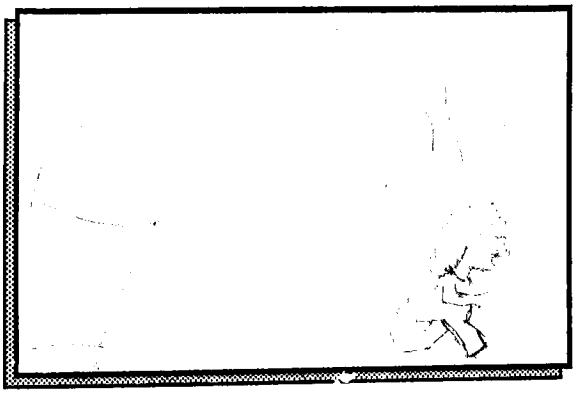
--- Scene 3 ---

49

to
lady sitting







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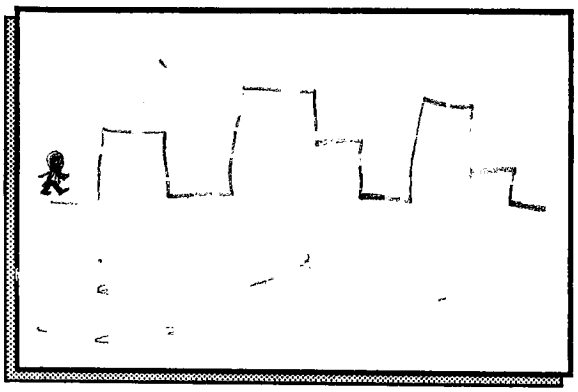

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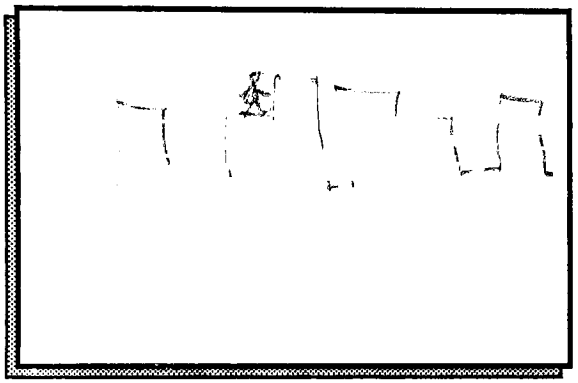

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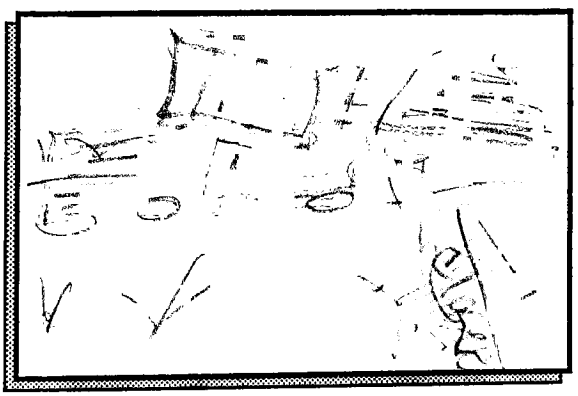

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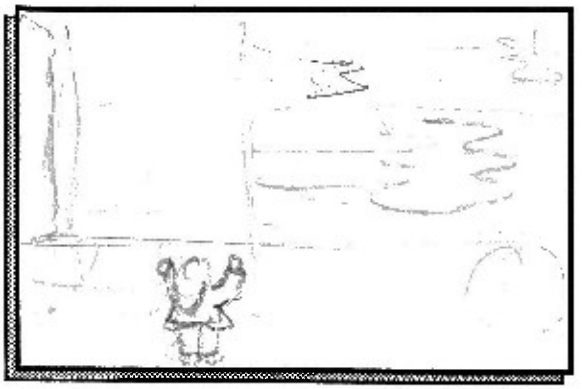

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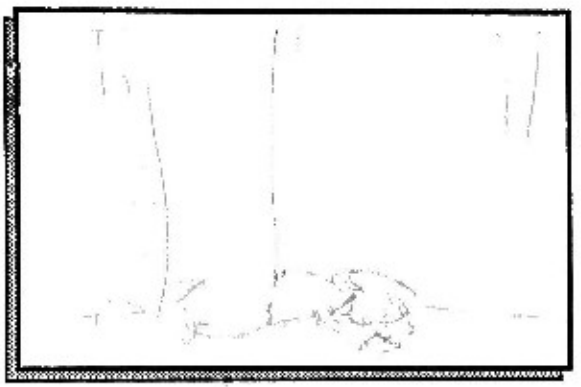

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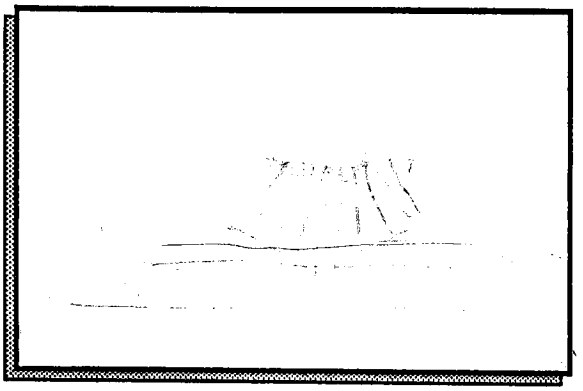
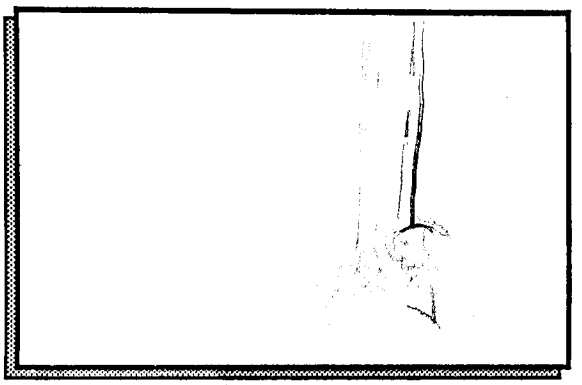
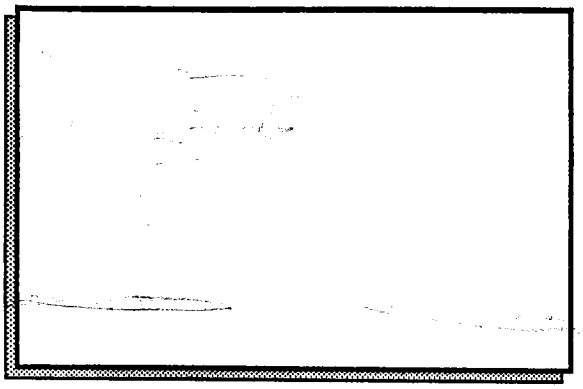
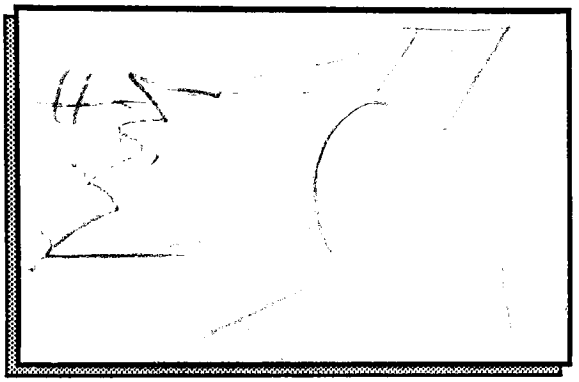
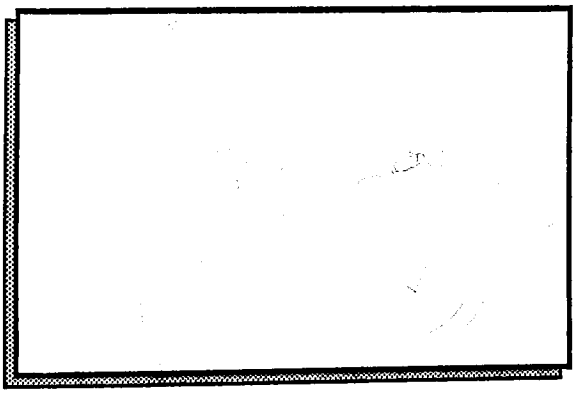
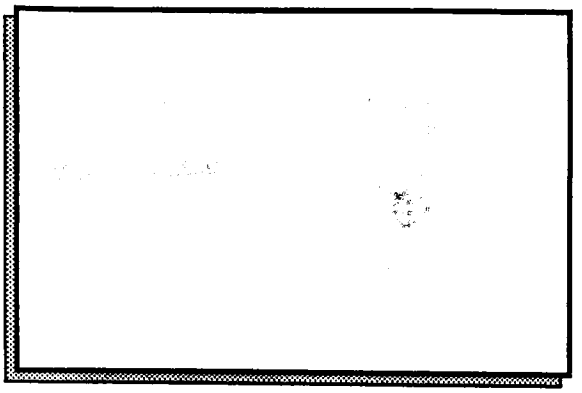


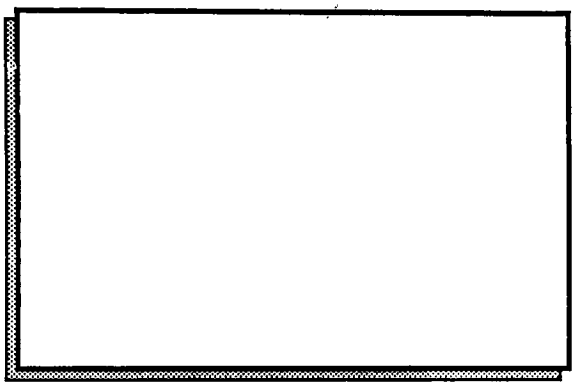




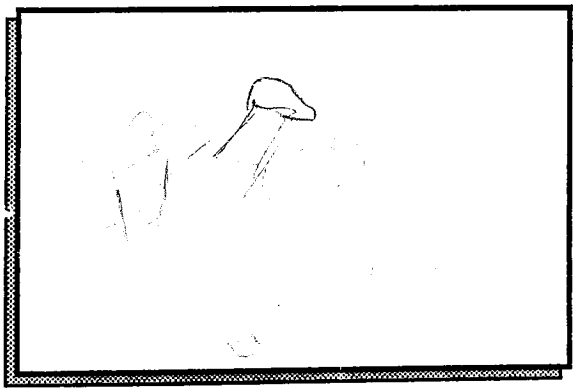








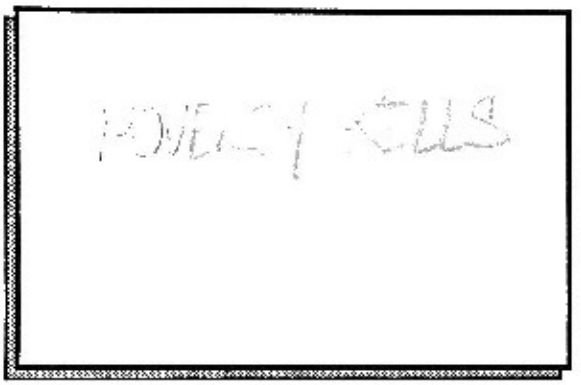
Pic



68

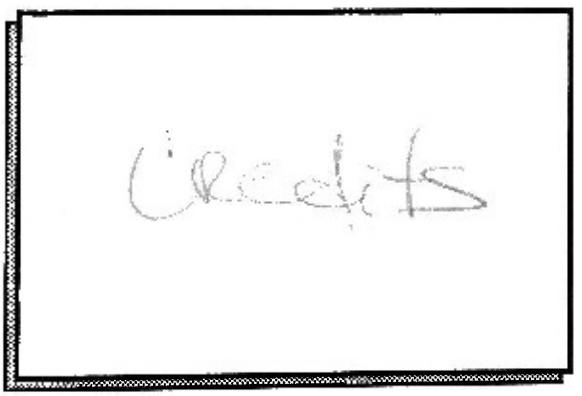
Poverty kills
of
Sound.

69



Fade out

70



ILLUSTRATIONS

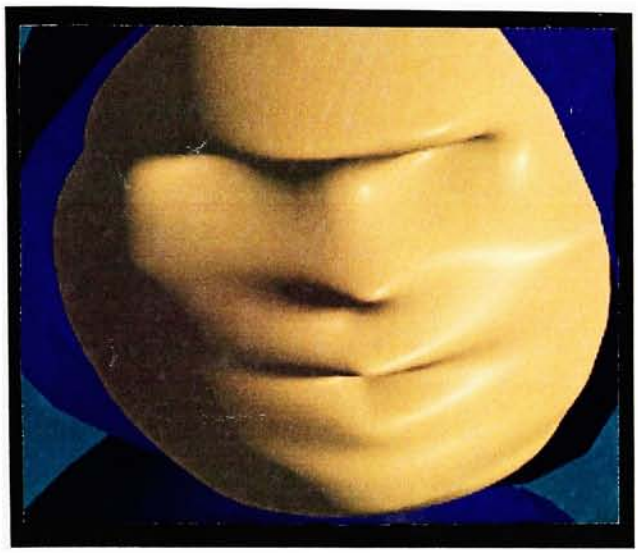


Fig. 3 - 3D rendered model without ears, hair, eyes or eyelids.

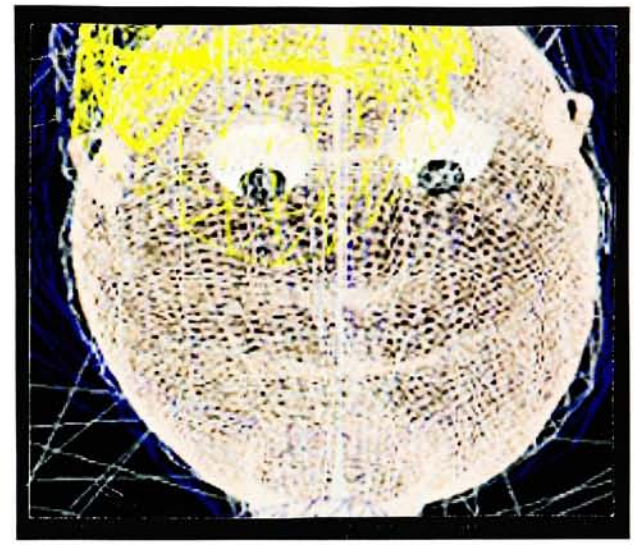


Fig. 4 - 3D wireframe with eyes, ears, eyelids and hair.

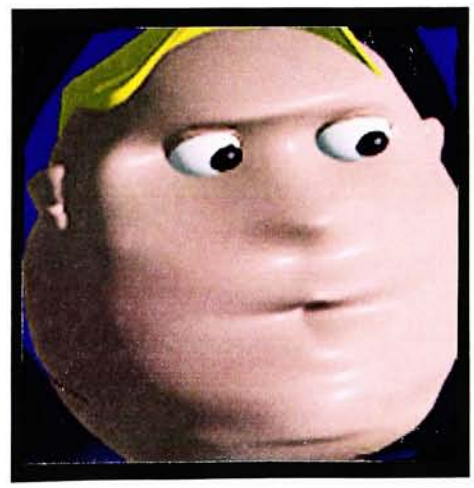


Fig. 5 - Fully rendered 3D model.

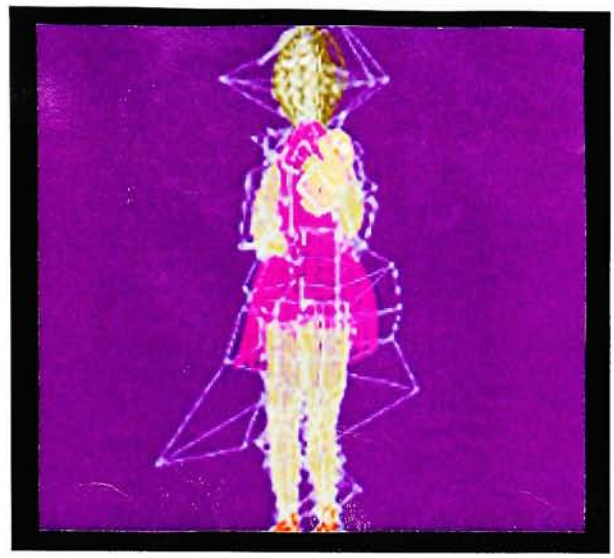


Fig. 6 - Wireframe of a woman showing no body under clothes.

Fig. 7 - Preview of a woman; illusion of body under dress.

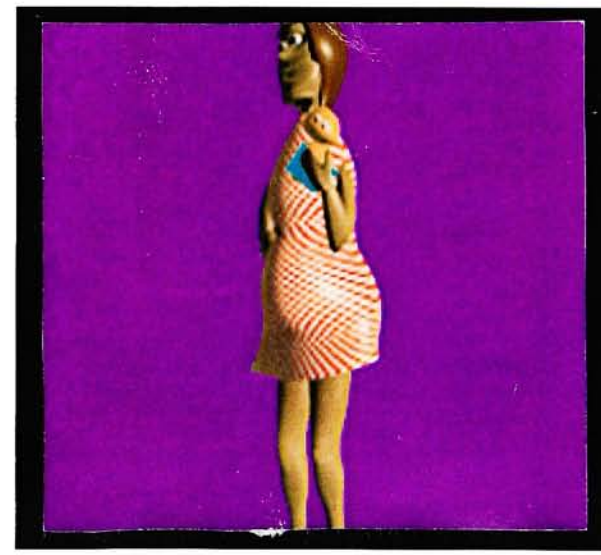


Fig. 8 - Mothers' dress texture mapped from Tips program.

Fig. 9 - An image fully rendered then saved as a picture file.

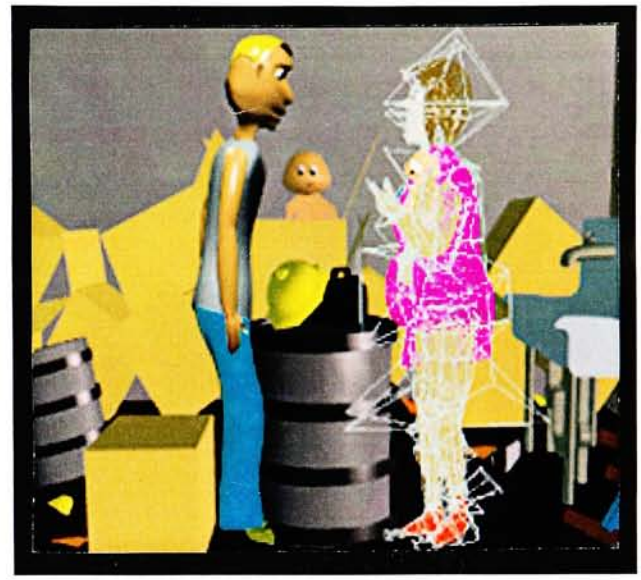


Fig. 10 - Picture file textured mapped on a rectangle; then father modeled, rendered and saved as a picture file. Mother with child is in wireframe & can be animated.

Fig. 11 - Picture fully rendered. It is hard to tell which model can be animated. In this particular shot, it is the mother.

APPENDIX

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FILM VIEWING

The Legend of Sleepy Hollow Walt Disney and Company.

Fantasia - Walt Disney and Company.

GLOSSARY

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Animation: A series of still images which, when presented in quick succession, create the illusion of motion.

Believability: *To have a strong persuasion for something to occur. To give credit to situations.

CD: Compact Disks

Flipbook: A series of still images, created on a computer to show the timing of an animation.

Homeless: *Destitute of a home.

Keyframe: The point at which an animator will change within the animation, a certain movement to another distinct movement.

Mesh: A group of spline polygons.

OMDR: Optical Memory Disk Recorder

Overlapping: A technique used to save on memory. When a picture file is used as a way of cutting down on the amount of models used in a scene.

Poverty: *State of being poor; indigence; want; insufficiency

Preview: A model which is built on the computer, showing each colored polygon.

RAM: Random-access memory

*Definitions from Websters Dictionary.
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GLOSSARY cont.

Real Time: The exact timing of how an animation will appear on an output device.

Rendered: A model where all colors, shadows and reflection maps are fully seen; where the model has an even tone. The color blends with no jagged edges.

Rendering: When the computer is recording each frame of an animation onto a device so an output can be viewed.

Spline: An object made up of points, which can be pulled in any direction.

Storyboard: A series of images drawn out to tell a story.

Texture Mapping: When a texture is projected, wrapped or applied to a computer object.

Topas: A 3D computer package from AT&T.

Tips: A 2D computer paint package that works with the Topas system.

3D: Three dimensional; extensions in three directions; using the x, y and z axis.

2D: Two dimensional; extension in two directions; using the x and y axis.

Wireframe: A model built on a computer, where no solid polygons, but all outlines of polygons can be seen.