

CHAPTER 4

ANIMATION: THE TESTING OF SPACE BY TIME

The art that comes next on the spectrum is hard to give a name to. We can, however, describe what it does in terms of space and time. Its primary purpose is to reveal change of spatial shape through time, and in such a way that there is no restriction, other than aesthetic, on the manner or rapidity of this change. While the same volatile mutability of images in time was evident in poetry, they and their flux were not poetry's primary content. Images are now promoted from their status in poetry and become the primary content of the work. They exist for their own aesthetic reasons, and nothing else is required, as in poetry, to trigger them. They are presented to us literally from outside us, do not depend on our imagination, and are seen alike by all¹.

The means used to present these changing images can vary, but it does not effect where we would place the results on the spectrum. It is sufficient only that the work exhibits images that change in a way that is not subject to any restriction, even that of story line. To name this art I have borrowed the term animation from film and given it a new meaning. Most of the "animated" works with which we are familiar, such as "Snow White", are not instances of animation in the present sense, but of film, an art we come to later on the spectrum. The techniques used in those works however, whether drawing by hand or using computers, can be used to create the works of art we are talking about in this chapter, where change of shape through time is explored as a primary end in itself.

Animation explores the passive response of space to the dynamic wishes of time. The forms we see have no material substance. Often they are projected on a screen. They offer no resistance to being changed. Space itself does nothing to limit time. Cause and effect does not limit in any way the nature or extent of the changes of appearance brought by time: all is possible². Causality applies only during the making the work. The creation of any part can require an indefinite amount of both effort and time. In the experience of the work there is no awareness of either, for they occurred in a different time and different space.

> FROM POETRY TO ANIMATION

As music segued to poetry when verbal meaning was added to pure sound, so poetry changes towards animation if we free the images of the poem from needing to be triggered by the meanings of words. It is as if the images from poetry continue to exist on their own and for their own sake. They no longer need to be images of "things" as they often were in poetry, they can be purely abstract and geometrically conceived. Thus in one way animation is a spatial residue of poetry: sound is removed, the work becomes silent, and sight by default becomes paramount. However, though time's "voice" is hushed, we are still very aware of its silent command in animation. Its presence is felt in how images change through time.

Given just the images triggered in our imagination by a poem, we cannot reconstruct the full meaning of the poem. The images were too secondary. Animation doesn't lead back to poetry. From music, to poetry, to animation, we go from pure sound to pure image, through the intermediary of words.

There is a second way of deriving animation along the spectrum. The technology of film is one way of creating a work of animation. This same technology can also be used in conjunction with any other art. There can be a film of a painting, of a sculpture, or of a building. There can be a film of dance. If we add sound, there can be a film of a performance of music or theatre. If we try to film a work of literature, we generate the type of film, or movie, with which we are most familiar. What happens if we try to film a poem? The only things it could show outwardly in the film are copies of the images evoked in our imagination by the poem. If we then eliminate the sound of the words from the film, we have in effect a work of animation.

Images occurred in poetry as a byproduct of meaning. In animation meanings can occur as byproducts of images if we feel prompted to "identify" what we are seeing in terms other than those that are purely spatial or temporal.

The fact that poetry sequences words through time means that it imposes a rapid pace to the changes of images in the imagination. Animation can choose the pace at which things change simply for joy of our experiencing a quality in the change due to tempo. It can split its space to show different things changing at different rates, or things which are not changing at all through a certain duration of time.

In animation we see a pure negotiation between space and time. While the momentary form is spatial, the change in form is temporal. Animation is the first art on the spectrum to rely on information from external space in order to provide us with the experience of internal qualities about how change occurs through time. Dance, the next art on the spectrum, similarly relies on space for information about time. In poetry we spoke of space as coming into and out of existence in time. With animation space is now present on a constant basis, but it must tolerate changes to its content that tests its definition as the house or holder of content. Not only is there no limit to the type of image that can be seen, there is no limit to either how radically (or subtly) the images change. A dance can also explore constantly mutating shapes in external space, but it is limited in its how and what by the physical nature of the human body. Unchained from verbal meanings, and not yet chained to a material object or human character, animation's images can be anything at any time and alter in any way at any time.

> THE WAY A FORM CHANGES THROUGH TIME CAN ITSELF BE THOUGHT OF AS
>> A DIFFERENT TYPE OF FORM. STATIC FORM AND DYNAMIC FORM

When form changes form, there is always some definition, even if just from moment to moment, of how this change is occurring. Just as we intuitively perceive the form of an object in space without having to know intellectually how to express this shape as a geometrical locus, so we intuitively sense the *how* when form changes form, without our having to know intellectually what the underlying pattern is defining the change. This intuitively perceived *how* in the change of a form through time, is itself a form, and is a form *of* time. In that it can only be expressed in time, I call it

"dynamic form". In contrast, any form we perceive in space before it undergoes any change, can be called a "static form". Static form is entirely appreciable for its spatial qualities alone. In animation, what we see in space gives us access to the temporal and dynamic aspects of the work. In animation there are thus two types of form at work. Artistry in animation involves the ongoing dialogue between these two.

Dynamic form can alter static form in various ways. A given shape, for example, can retain its shape and move as a whole through space, only changing its position with regard to the frame of the spatial field and other shapes in the field. There are two parameters that can vary. The speed of the moving shape (measured in space and time), and its route through space (measured just in space). A another example is a shape that changes size while remaining self similar, i.e. its size changes but not its shape, for instance a circle that grows larger or smaller. The parameters here are the rate of change in the length of the radius, the rate of change in the speed if any (acceleration) and, indirectly, the area the shape occupies. A more complicated example of dynamic form is one shape changing into a different shape, for instance a square into a circle. Here there are an infinite number of possibilities as to how to effect the change. There can also be any number of intermediate forms: triangles, hexagons, etc.. Other types of dynamic form involve a change of color, the subdivision of one shape into many, the fusion of several shapes into one, the appearance of a shape from nothingness, or its disappearance once there.

While the aesthetic of the work of animation is influenced by the static shapes it works with, it is directly felt internally by the nature of the dynamic form, which in turn is a direct study of the effect of time upon space. If the dynamic form gives us access to the *how* of the change in static form, the static form gives us access to the *what* that is changing within the dynamic form, even though that what may exist only for a short period of time.

The dynamic form does not exist for the sake of the static form in animation. The static form exists for the sake of the dynamic. Everything about a static form can be explained by space alone. The dynamic form though is not only revealed indirectly through space, its main modality is a quality of type of change in time. Thus, a static form on its own cannot give information about a dynamic form, but a static form that occurs within a dynamic form can be said to have been *brought into existence* by the dynamic form. By that interpretation, the dynamic form is also the cause of the *destruction* of the static form.

Change itself is something that we see in the midst of happening. We do more than understand that change is happening, we do not have to deduce it after it has occurred. We are tangibly aware of it: we *see* change. We apprehend it while still within what we take to be a *single moment* of visual perception. Change lives within visual sensation itself, it is not deduced from it afterwards. We *sense* growing, contracting, movement in general, *as* it is happening. We cannot arrive at the feeling of change by statically comparing an earlier state with a later one. That would imply that they are both before us and we can go between them at our leisure to compare them. The immediacy of the perception of change indicates that the very immediate past lives closer to the present than can be separated by memory from the present.

If change in form is occurring continuously, even within the smallest consciously measurable unit of time, do can we ever truly perceive a static form? One way of ascertaining this is to freeze the

change in form at a certain moment during its evolution, and then to ask ourselves whether the frozen form resembles what we saw as the freezing occurred. For instance, I am watching the last moments of a TV episode. The main character says goodbye and walks towards the door, but never gets there because h'er steps are frozen en route. When I look at that person's appearance at the moment the action was frozen, and then again an instant later, s'he does not *look* the same, though technically there is no change in h'er position or form. This is because change is perceived within the single moment of consciousness. H'er form at the moment of freezing already contained and foreshadowed h'er future appearance. The flow of the form through time was already there. Once frozen though, if we look a moment later, its appearance has been deprived of that momentum.

The same inconsistency occurs if we stop a melody in mid progress, and just hold the last note indefinitely. How that note sounded as it started strikes us very differently than how it sounds once the melody has stopped. As the melody is completing itself through time, each note receives the impetus of the previous note and transfers it on to the next note. Once the flow of the melody stops we can not sense this connection within a single note. Perhaps we are overstating the case. While the boundary between motion and stillness is profound, the fact that we can perceive motion at all within a single instant, means that we can gain at least an *intimation* of motion from a still figure. When we glance at a statue we may see it as if it just stopped moving. There is still a flicker of the motion. Without reference to past experience with human figures, however, we would have no way of knowing that a human figure could be in motion. So in a way, the intimation of motion is dependent on "human-meaning" which makes it less closely allied to considerations of just pure space or time. In general, from space alone, we have no way of knowing whether what is now a stationary is or is not something that might have been moving or could again be moving. We never know if a still form is an "excerpt" from something with a history of change in time.

There are qualities of motion that are suggested by the shape of a static form. If we look at a sine curve we see it rising and falling if we compare one position in space with another. However, it will always be in the same positions at all time. If we compare it with a sine curve that is itself actually in motion through time, twisting and turning snake-like, the same part of it now rising and then falling, we will note certain differences. With the static line, a history of the motion is there, but simultaneously in time. It is distributed only in space. Everything required to perceive it's suggestion of motion is available to us in space at *all* moments in time, regardless of the time we require to notice it. With the other line, *not* everything required to perceive its motion is available in space at the same time, regardless of the time it takes us to notice it. We explore this again in the chapter on dance when we discuss the path left in space by the dancer's motion.

We can determine if there is an exact boundary line between dynamic and static form. A film is taken of a dancer executing a continuous motion. We edit the film in successive stages. At each stage we remove every other frame of what was in the last phrase, and replace the missing frame with an identical copy of the frame that immediately precedes it. We repeat the procedure until we are left with a single unchanging image that endures for the same amount of time as the original, unedited film. At each stage we watch the results before editing again. In its first form, the flow of the motion seems normal. After the first round of editing, not much seems different. There are, after all, twenty-four frames of film going by each second. At most, perhaps we detect a very slight change in the quality of the motion. Maybe it seems more deliberate than we remember from the original. Several stages later, the motion is noticeably less flowing. It is stilted, the dancer seems to

be limping, but the motion seems to continue regardless. Eventually each image remains long enough for us to start actively comparing it image with the previous image. We notice that the new image doesn't to flow out of the old one: it is too different, the dancer is in too different a position in space. The order of the images makes less intuitive sense without the quality of motion to explain each next static form. Motion is no longer accessible to us within perception. Progressively, it is the static attitude of the body that interests us rather than the quality of how it moved. Static form replaces dynamic form.

> AT THIS POINT IN HISTORY, ANIMATION IS NOT A PERFORMED ART

A performance of a temporal work of art requires the existence of actions by a person or persons congruent with our experience of the work, which either themselves constitute much of the direct content of that experience, as with dance and theatre, or, though not themselves the content of the work, produce in real time the that direct content of the experience of the work, as is the case with music and poetry. Animation requires only a flick of a switch to start a projector.

The performer of a poem only has to suggest images to our imagination through the sequencing of words for those images to appear. Beyond the muscles of the vocal chords, it requires little instrumentality. In animation, the images are in external space, and it requires an apparatus to create the images. At this stage in history there is as of yet no effective way of performing a work of animation. In the future, however, a device will probably be designed that can not only create the necessary images but allow their form to be molded and modulated through real time via an intuitively simple set of controls. This future performer would be a descendent of the astronomer of today who controls projector in the planetarium, who at his whim alters the speed with which the stars move through the sky, or alters the apparent latitude from which we seem to observing.

Until such future apparati exist, there is still one way we can sense, albeit weakly, a performance in a work of animation. To the extent that the shapes that we see changing, preserve some identity through a portion of this change, we can think of the changes as *occurring* to these shapes. They become the characters of the novel or the actors on the stage.

Later in the book we will describe how in the spatial arts there is still a type of performance. It lies in the acts done in time by the work's creator to create the work. This performance however is over by the time we witness the work, and nothing about the temporal nature of that performance is visible in the work in its completed form. In between the performance of a very temporal art, and the echo of this performance in the spatial arts, there is the state found in film (motion pictures) where the performance is over by the time we see the work, but much about the temporal nature of that performance is still visible in the work in its completed form.

> MORE ABOUT SPACE IN ANIMATION

> INTERNAL AND EXTERNAL SPACE

When I was first developing the ideas for this book I thought that external space meant a more fully developed space than space in the imagination and that arts that relied on external should lie closer to the center of the spectrum. I felt external space was realer because, like the everyday reality, it is

seeable by all. I abandoned this idea as I became aware of other, more important, differences in the way the various temporal arts used space and time. In anticipate here some of the conclusions from the next several chapters. The space of poetry is imaginary, and while we cannot physically step into it, or interact physically with its content, we can do both *using* the imagination³. Nor was being external a guarantee that we can enter a space and interact physically with its content. Animation, film and space (a spatial art) use a protected space that is external but into which we cannot enter, and with whose content therefore we cannot physically interact. I also discovered that while poetry and literature both use imaginary space, they control time in very different ways. The space of dance, though external, is in many ways still being newly created in time (just as in animation, it is on the verge of being de-created and pulled apart by time). And in theatre, space though again external, is still quite primitive and alive with the resonance of action in time.

> SPECIAL EFFECTS IN ANIMATION HAVING TO DO WITH SPACE

Shapes in animation can move in accordance with being on the surface of any definable three dimensional object. . Shapes can change in accordance with the rules of perspective of any geometry, not just Euclidean geometry. Projections of objects into two dimensions can be made of objects from more than two dimensions (and not limited to three). A shape can be seen as if simultaneously from different points in space. It does matter, because the perspective *we* see has nothing to do with where we are in *our* space. There can be multiple vanishing points as if several people in different places are viewing the same object. Objects can be foreshortened in reverse of normal perspective as if we were standing on the side opposite from the one we think we are. The nearer side a cube can appear smaller than the farther side. A nearer side, instead of occluding a side behind it, can reveal it, while the side that we can take as being closest to us can be blocked from view by the side we would think is farther away.

The static forms that all these effects produce can also be depicted in painting. Animation and painting are the first arts on their respective sides of the spectrum to deal with an external space, and both do so by creating a space into which we cannot physically enter, in which our position relative to its surface becomes irrelevant to our implied position relative to what is seen on the screen.

> THREE DIMENSIONAL ANIMATION

Techniques exist in our era, including holography, and will certainly exist in the future, by which to create a three-dimensional work of animation. In this book, we try to distinguish between aspects of an art that are inherent to the nature of the art, and those that are accidents of historical development and technology. In a three-dimensional work of animation we could move around, but the images of the work would still be illusions. So, in spite of motion, we are still *not* within its space. If we were the images would be pliable to touch. We would not be able to physically interact with its images. In the sensory makeup of animation and painting, touch is separated from sight. Only imaginary sensations of touch can be evoked, though they can be strong. Any actual attempts at touching in the work's space would produce perceptions that would not be consistent with what we see, and would belie them.

> COMPARISONS BETWEEN ANIMATION AND OTHER ARTS

> WITH PREVIOUS ARTS ON THE SPECTRUM

> WITH POETRY

In poetry, the persistence of space through time is not certain. In animation, space is persistent through time, though what is in space can suffer the most radical changes at the hands of time: space having no choice but to passively submit to its buffets. In poetry space is not yet vital. Animation however could not exist without space. In poetry, images are there, and are evoked *through us*, but they are not the work's primary modality. In animation images arise through their own power and are the primary experience of the work. Poetry traces complex emotional, internal states of being through time. Animation traces complex internal ways of changing through time, by causing changes on external spatial states. In poetry, sound, in *time*, is the source out of which we obtain data about the content in *space*. In animation, *space* is the source from which we obtain data about states in *time*.

Poetic images tend to resemble things human and natural while animation's can be of any type, abstract or not indifferently. In both arts there is nothing material in images - no hardness, elasticity or resistance - for space to hold on to. They are form without mass. In the first three arts of the spectrum, cause and effect has no bearing on what types of changes may occur through time to the content of the work.

> WITH MUSIC

While we would soon grow tired if musical sounds never varied, we can remain engrossed for a prolonged time in contemplating the formal spatial relationships between the unchanging parts of a static image in space. The author once composed a piece that was basically sustained a many voiced chord, within which now and then just one of the notes changed pitch. The "one-dimensional" space of pitches can quickly become crowded with too many simultaneous notes. While there is a limit to how many voices the ear can distinguish or follow before polyphony becomes too *thick*, in space there is unlimited *room* for any number of parts, which do not have to necessarily become thickly crowded. This is because space opens up in more than one dimension. Moreover, as long as content does not change through time, space invites further contemplation in order to yield all its spatial relationships, whose number rises exponentially as the number of parts increases.

> WITH UPCOMING ARTS ON THE SPECTRUM

When we come to theatre and literature, a story line becomes an essential feature.. Though a work of animation could relate a plot or story to us, it is a secondary aspect of the work. The same is true of dance, which comes next on the spectrum between animation and theatre.

Notes

¹ In poetry there was no physical cause for images, but in animation there is.

² It is the geometric equivalent of what Minus says at the end of Ingmar Bergman's "Through a Glass Darkly". "When I clung to Karin down in the wreck, reality burst ... and I tumbled out. It's like in a dream. Anything can happen.. .Anything."

³ The fact that we can enter poetic images through our imagination suggests thinking of animation as the outward projection of our imagination, the price being it is no longer accessible inwardly or outwardly.

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