

Between Veridicality and Illusion

Joseph Anderson

"Why does a movie seem so real? And why do the spokes of a wheel turn backward?" These are questions that many untutored film viewers ask in one form or another, but my interrogator at the moment was not untutored. He was, perhaps, unschooled in theories of film but well trained in the art of asking questions--he was, after all, an attorney.

As a movie viewer, he had no doubt many times been caught up in the enchantment of the world created by the motion picture, only to have the spell shattered by the intrusion of a stagecoach or carriage wheel that perversely rotated in the wrong direction. His lawyer's suspicions had been aroused. His sense of reality had been toyed with. He knew that something was not quite right. Now he had before him an "expert witness" from whom he would extract the truth.

I squirmed in my chair and perhaps failed to look him directly in the eye, for I knew that out of either naiveté or, worse yet, practiced lawyer's cunning he had come upon a major inconsistency, a central paradox underlying the art of the motion picture--its capacity for realism, and its denial of reality. A generation of film theorists before me had lined up to argue that the motion picture was *not* entirely realistic and therefore could take its place as a bone fide art. Others had argued that the value of the motion picture lay precisely in its capacity for realism. I knew that if I ventured in either direction, mountains of evidence could be weighed against me. Worse yet, he seemed to be asking about more than realism; he wanted an explanation of his experience of a motion picture. What could I say or do? I was trapped.

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I took a sip of coffee, and slowly looked my questioner in the eye. Fortunately, I was not testifying before a court of law, but having a cup of coffee with my learned friend. Nevertheless, I responded as truthfully as I knew how. "They are illusions, both the sense of reality and the wheels that rotate in reverse."

My friend leaned against the back of his chair and lightly brushed his moustache with the tips of his fingers. "You have not answered my question," he said evenly. "You have merely given me the word *illusions*, a name, a category, not an explanation. A category is not an explanation. What is required is a reason, a cause, at least a relationship, perhaps a mechanism. If you answer 'illusions' to my questions of why movies look so real and why spoked wheels turn backward, then you must explain what illusions are and what they have to do with motion pictures."

I began searching through my pockets for some change for the waiter. "We had better adjourn this session," I said emphatically, fearing the answers to his questions would fill a book.

What makes the lawyer's tale worth telling is that although we live in a time when crime flourishes, minorities are oppressed, women are victimized, and evil abounds in the world (and these are things with which he is professionally familiar), he chooses to focus not upon the overt content of particular motion pictures, but upon the source of the power of the motion picture generically--power that he has no doubt witnessed by effect in the world at large, but more to the point, a power he has personally felt while sitting in the theater watching a movie. He wants to know why a motion picture gives him convincing reality in one moment and takes it back in the next. Is it something in the picture or something in him that provides this push-pull in and out of the world of the motion picture? In his unguided and perhaps naive search for an understanding of the great attractive force he feels emanating from the screen, he has focused upon the obvious--the interface between the film and the viewer--an area that professional film scholars have phobically avoided for almost a century. By a strange progression of events the longer scholars have studied film the farther they have gotten from the interface between the film and the viewer, and, it might be argued, from an understanding of the source of cinematic power.

Hugo Munsterberg, arguably the first film theorist, set film theory clearly on a path that would have confronted these questions directly, though it was a path that no one chose to follow. Munsterberg had first come to Harvard in 1892 at the invitation of William James to help set up a psychological laboratory. It was as one of the founders of American psychology that he wrote *The Photoplay: A Psychological Study*, published in 1916.¹ What a stroke of luck for the field of film theory to have as its founder one of the most brilliant and educated men of his day. Specifically, the good fortune lay

in that one of the very few people capable of analyzing the interface between the motion picture and the mind of the viewer chose to do so.

Munsterberg was familiar with the the empirical research being done across a broad spectrum of psychological areas. Much of it was being carried out in his own laboratory at Harvard. The tools of what would become the social sciences were being discovered, and they were being put to every conceivable task. The research of the day was a pragmatic enterprise dedicated to finding out how things work. Munsterberg brought this interest in practical problem solving, along with his specific knowlege of the results of scientific experiments in psychology, to the study of film. In doing so he demonstrated that empirical investigation can shed light upon the study of the motion picture. The outcome of his short but intense study of the interface between the film and the viewer is that he redefined both in a way that squares with the physical reality of the filmic experience. He discovered that the completed film exists in the mind of the viewer, and that the viewer participates directly and extensively in its construction. To future students of the motion picture he bequeathed the concept of an *active viewer*.

Unfortunately, even in Munsterberg's own work the concept of the active viewer was overshadowed by his efforts to defend film as an art. In the debate over film's status as an art the idea was virtually lost to film study. Even Rudolf Arnheim, a psychologist trained under Wertheimer and Kohler, did not choose to focus his primary attention upon the processing of the film by the viewer. In *Film as Art*, his only work devoted exclusively to the motion picture, Arnheim chose instead to enumerate the ways in which the stuff that makes up a movie is not realistic and is therefore (in his view) suitable material for art.² In making his arguments about the nature of film he had much to say about how a viewer processes the flickering picture before him. His own perspective on the problem was not all that different from Munsterberg's. And like Musterberg, many of his insights into how we see motion pictures still ring true. But also like Munsterberg, Arnheim bore a great burden that we do not share today. He felt compelled to prove that a motion picture was not a cold, heartless, mechanical reproduction of reality, but a human creation that could take its rightful place along side the traditional arts.

The first wave of film theory was devoted to the defense of film as art, and once film was successfully established as an art, meriting the same attention as the other arts, the direction of film theory was pretty well set. Enthusiastic young filmmakers and cineastes in several countries sought to do for the cinema what had been done for the other fine arts--to define the medium's essential components (as art) and to analyze their manifestation in particular works in that medium.

Theorists as divergent in viewpoint as André Bazin in France and Sergei Eisenstein in the Soviet Union chose to dwell upon issues related to how a

motion picture might best be structured in order to maximize those aspects of the medium which they each believed best revealed its unique character. The "auteur theory" that grew out of *Cahiers du Cinema* in the 1950s also underlined the focus on film as an art, asserting that if film is an art, then the director is the film artist. By virtue of this logical construct it became possible to analyze not only an individual work of film art, but to look at the whole of an author's oeuvre as in the study of literature, drama and painting. The way was thus paved for film, a decade later, to enter the academy in the full humanist tradition.

It might be said that film study flowered for three decades in the humanist garden of the academy. But it can also be argued that what was once a valuable and necessary nurturance, if film's full potential were to be recognized, became restrictive to film study in general and film theory in particular. The summer of film study passed and no blossoms remained. A tacit assumption prevailed that the subject of film study *is* film art. Indeed it became prescriptive: the film scholar was to take as his subject film art (not a defense of film as art, but that collective body of films that by general consensus constitutes film art) and provide yet another "reading" of it for his colleagues. To proceed otherwise--for example, to ask as Munsterberg did about the psychology of film viewing, to look at film from an essentially scientific point of view--was presumed to threaten the medium's status as art, to lessen its significance and lower its dignity, to deny the aesthetic nature of the film viewing experience.

Yet we are hard pressed to answer even the most mundane questions about the film experience, such as why the spokes of a wheel turn backward, without drawing upon empirical research in perception. And we cannot simply skip over the basic questions of film viewing in our haste to get to higher order meanings. It is becoming increasingly apparent that if we are to answer questions about the illusion of reality in the photographed image, the diegesis, the narrative, we must be prepared to draw heavily upon work in perception, cognitive psychology, neurophysiology and other disciplines concerned with the construction of meanings.³ The mind constructs meanings out of whatever is an hand--sensory data, memories, expectations. In film, the meanings start with the interface between a viewer and images on a screen. (Sometimes the viewer is the filmmaker himself, but we shall defer this matter until later.) No detail of this interface can be responsibly ignored. If we are to understand film as well as appreciate it we need to study it from that point of view. What the fresh perspective of cognitive science demands is that if we seek a theoretical understanding of the process and experience of film viewing, then we must begin by temporarily setting aside our concern with film as art. In his *Art as Experience* John Dewey describes our situation most eloquently:

In order to understand the meaning of artistic products, we have to forget them for a time, to turn aside from them and have recourse to the ordinary forces and conditions of experience that we do not usually regard as esthetic. We must arrive at the theory of art by means of a detour. For theory is concerned with understanding, insight, not without exclamations of admiration, and stimulation of that emotional outburst often called appreciation. It is quite possible to enjoy flowers in their colored form and delicate fragrance without knowing anything about plants theoretically. But if one sets out to *understand* the flowering of plants, he is committed to finding out something about the interactions of soil, air, water and sunlight that condition the growth of plants.⁴

It is not our intention to deny or disregard the aesthetic nature of the film viewing experience. We must return to the exquisite color and delicate fragrance of the flower. Indeed, the aesthetic experience is essential in our effort to understand the totality of the film viewing experience. (It was none other than Hugo Munsterberg who observed that the psychological inquiry and the aesthetic inquiry belong intimately together.⁵) But first, we must turn aside from the aesthetic and ask some very basic questions. We cannot ask "How do we see film?" until we have arrived at a better understanding of how we see anything at all.

For the moment, however, let us consider a second argument that has been put forth against a scientific study of film. The objections, unlike those of scholars concerned to preserve the aesthetic nature of the film viewing experience, stem from a rejection of the most fundamental assumptions of science itself, a rejection set forth in spite of the unmatched record of success for science in furthering our understanding of the universe in which we find ourselves.

Admittedly, the course of science has not been a straight path of progress. It has taken twists and turns and has sometimes backtracked. As Karl Popper has observed, it is, after all, a human endeavor like all human endeavors, albeit a special one.

The history of science, like the history of all human ideas, is a history of irresponsible dreams, of obstinacy, and of error. But science is one of the very few human activities--perhaps the only one--in which errors are systematically criticized and fairly often, in time, corrected. This is why we can say that, in science, we often learn from our mistakes, and why we can speak clearly and sensibly about making progress there. In most other fields of human endeavour there is change, but rarely progress . . .⁶

Science *can* be said to progress, and that is part of its claim to a special category among human enterprises. It is the specialness of science, its uniqueness among human endeavors, however, that some film scholars have refused to grant. Science is built upon the assumption that there is a physical world and that it can be known by observation. In general, science proceeds by the formation of hypotheses about the world which are then tested. The tests are required to be open and repeatable, and results are continually questioned and re-evaluated. These are rather straightforward assumptions and relatively simple rules; so why have many film scholars rejected science outright and with it the work that has been done in a wide range of fields which might have a bearing upon our understanding of film? The answer is clear enough: some film scholars have adopted the view that science is but another set of conventions; that its claim to special status is no greater than could be made by any culture for its religion or institutions; that science is no more than a tool of cultural imperialism with which Western culture attempts to maintain its dominance over the rest of the world! While such a view apparently has a certain surface appeal, in order to maintain these notions advocates must somehow be willing to deny either the existence of the physical universe or the possibility of knowing it. This is not the place for a full exposition of the argument, but the fact that film scholars took such a position left film study in the predicament in which we found it at the beginning of this decade. In the absence of any criteria for establishing the relative accuracy of any given theory, we were left with what has come to be termed "conventionalism," an attitude which counts all theories as equally valid, all signs as conventional, all expectations as solely culturally determined--what E.H. Gombrich is said to have identified as "a manifestly absurd relativism."⁷

Cultural determinants undeniably play a part in the construction of meaning in art and in life. (That point has been more than adequately made in the last decade.) But to emphasize cultural and social determinants to the virtual exclusion of psychological and biological ones leads to exactly the kind of relativism E. H. Gombrich so deplored, and to a denial of the possibility of the very task of *understanding* in which scholars are presumably engaged.

Fortunately, the conventionalists were wrong. While they were despairing of the possibility of knowing, research was continuing in the disciplines that have come to make up cognitive science. Today, it is indeed possible to pursue an understanding of how we see motion pictures and why we like them so much, an understanding that can encompass both the passage of time and cultural differences. Even if this pursuit requires a long journey, it is our only reliable path to new knowledge.

When a viewer sits before a theater or video screen to watch a movie he faces a sequence of images and sounds for a duration of approximately ninety to one-hundred-twenty minutes. The precise nature of the sequence is neither

arbitrary nor random but of a most carefully crafted order. The makers of the movie have often spent many months and millions of dollars to achieve perfection of individual elements and overall form.

It becomes readily apparent that the motion picture / viewer interface is not equally balanced, for while a motion picture is created specifically for the viewer, the viewer was not created for watching motion pictures. The implications of the imbalance, however, are not so easy to grasp. It may be helpful to draw an analogy. The filmmaker can be seen as a programmer who develops a program to run on a computer that he does not understand and whose operating systems were designed for another purpose. His program is, however, truly a program rather than either a language or a mere set of stimuli. It is a very complex set of instructions utilizing images, actions, and sounds, a string of commands to attend to *this* now, in this light, from this angle, at this distance, etc., and to recall earlier sequences and anticipate future ones. The program cannot be run on a projector or a video tape machine. These devices have no capacity to interact with the instructions--the program can "run" only in the mind of the viewer.

Since the filmmaker/programmer does not understand the operating system, he is never sure exactly what will happen with any frame or sequence of his program. He therefore proceeds by trial and error. He follows certain filmic conventions and then goes beyond them by guessing. He tests the outcome (that is, how his program will be handled in the mind of a viewer) by becoming a viewer himself and running the program in his own mind. This is a fairly risky procedure, because each human mind is different, and different sub-routines may be initiated by the same instruction, and different meanings may be constructed in each mind. But the filmmaker-turned-viewer is not proceeding completely recklessly and irresponsibly, because the "hardware" of the mind, the brain along with its sensory modules, is standard. The same model with only minor variations is issued to everybody. The basic operating system is also standard and universal, for both the brain and its functions were created over a hundred fifty million years of mammalian evolution.

The analogy between the human mind and a computer may serve to help us grasp the relationships between the cinematic apparatus, the filmmaker, and our processing systems. It also points up just how different our mind is from present day computers. Both are capable of computing functions of considerable complexity, but the computer which I now employ in writing this text is a serial, digital, highly programmable device; the mind is none of these things. It is first of all, much more complex. The brain itself is very likely the most complex structure in the universe. It processes in parallel as well as sequentially, and it frustrates most attempts at reprogramming. (The structure and function of the brain may be so integrated that to speak of "hardware" and "software" even by analogy may be unjustified.) Yet the brain is not as good

as the simplest commercial computer at carrying out tasks like keeping track of expenses or balancing check books, and there is little one can do to change its capacity or procedures for calculation. But it is very good at guiding our movements in three dimensional space, so that we do not bump into trees or fall into chasms, and at locating an object of prey precisely in space and guiding our arm in the hurling of a stone or spear with deadly accuracy. The point to be made is that by whatever device or analogy, we must understand that our brains and sensory systems, indeed our very consciousness, our sense of self, our mind in all its implications, is the present result of past evolution, and for most of the time during which our capacities were being cruelly sorted by the processes of natural selection, the contingencies of our existence were quite different than they are today.

The origins of man's visual system vastly predate the emergence of man. To move about with speed and agility, and to hunt successfully, a predatory animal needed accurate information about the location of things in space. By the time man emerged the visual system in predatory mammals was pretty well defined, and its central organizing principle was *veridicality*. This is to say that the model the individual constructed of the visual world before him needed to be a very close approximation of that world. It had to be accurate enough to act upon. The consequences of error were severe. If a predator were not correct about the location of a prey in space he would not be successful as a hunter. He would starve, his young offspring would starve, and his genes would never be passed on to succeeding generations. The cold, indifferent process of evolution selected for veridicality in the visual system not through purpose but through contingency.

As the anatomy of a visual system developed (for example with the shifting of the eyes to the front of the head as in cats and primates) a kind of operating program developed as well. The program calls in part for comparing the array of brightnesses in both eyes and computing the degree of displacement between the images in each eye. This procedure, known as stereopsis, results in the location of an object in space and is very accurate at close range. Of great interest to us as students of film is the fact that once the rudiments of the operating program for stereopsis are known it becomes possible to present a set of instructions to the visual system and predict the resulting percept with considerable accuracy.

Most of us have been to a 3-D movie where we put on a pair of glasses which allowed us to see separately with each eye images which were photographed simultaneously from two positions set apart on a horizontal axis. As we watched the movie we ducked and dodged spears and boulders and all sorts of objects that were hurled at us from the screen. We screamed and squealed in fright, but we knew it was only an illusion. We delighted in the

illusion of three dimensional depth, and the illusion of danger, both for the same reason--we delight in the paradox between realism and reality.

The simplest definition of an illusion is that it is a non-veridical perception. In the 3-D illusion we perceive depth when in reality there are but two slightly offset images projected simultaneously upon a flat screen. Such illusions are particularly revealing about our perceptual systems. Visual illusions, like 3-D, result when the visual system, following its own internal instructions, constructs a percept which is in error if compared to physical reality, i.e. illusions occur *because* the system follows the "rules" even though the resulting percept is in error. To perceptual psychologists, and by extension to those of us who would understand motion picture viewing, illusions are of special interest because they reveal the "rules" according to which the system functions--rules which are ordinarily invisible. By studying the system when it makes an "error" we can see the "rules" exposed; by studying the rules we gain a greater understanding of how the visual system interacts with a motion picture.

The mind has no direct access to the outer world. The brain itself resides in a dark recess inside the human skull and receives only electrical impulses from nerve axons projecting from its sensory organs, the eyes, the ears, the nose, the tongue, and tactile sensors in the skin. It is precisely the fact that the mind cannot apprehend the world directly, but must construct an approximation, a model, by systematically transforming sensory input, that allows for the possibility of illusion. Illusion at the initial levels of processing apparently has no adaptive value. It is a non-consequential by-product of a system designed for veridicality. That the system processes inputs from images projected on a screen and sounds emitted from a metal speaker according to the same "rules" as inputs from the real world allows for the possibility of cinema. The motion picture resides in that cognitive space between veridicality and illusion.

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Notes

1. Hugo Munsterberg, *The Film: A Psychological Study* (New York: Dover Press, 1970); an unaltered and unabridged republication of *The Photoplay: A Psychological Study*, originally published by D. Appleton, New York, in 1916.

2. Rudolf Arnheim, *Film as Art* (Berkeley: U of California P, 1957); an adaptation of *Film*, first published in German in 1932.

3. "Cognitive Science" is a current interdisciplinary effort that traces its roots to the mid-1950s. It includes such disciplines as perceptual and cognitive psychology, artificial intelligence,

linguistics, anthropology, ethnology, philosophy and neuroscience. For further discussion of cognitive science see *Cognitive Science* (A special issue of the *Irish Journal of Psychology*, Vol 10, No. 2, 1989); *Iris* No. 9, Spring 1989, devoted to Cinema and Cognitive Psychology; *Methods and Tactics in Cognitive Science*, Walter Kintsch, James R. Miller and Peter G. Polson, eds. (Hillsdale, New Jersey: Lawrence Erlbaum Associates, 1984).

4. John Dewey, *Art as Experience* (New York: G.P. Putnam's Sons, 1958) 4.

5. Munsterberg 17.

6. Karl R. Popper, "Truth, Rationality, and the Growth of Scientific Knowledge," in *Philosophical Problems of Science and Technology* (Allen & Bacon, Inc., 1974) 78.

7. See M. Krieger, "The Ambiguities of representation and illusion: An E. H. Gombrich Retrospective," *Critical Inquiry*, 11(2), pp. 181-194, and Gombrich's response to Professor Krieger in the same issue, pp. 195-201.

8. For a discussion of stereopsis see Bela Julesz, *Foundations of Cyclopean Vision* (Chicago: U of Chicago P, 1971).