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MACHINES OF THE VISIBLE

J e a n - L o u i s C o m o l l i

INTRODUCTION

One of the hypotheses tried out in some of the fragments gathered together here would be on the one hand that the cinema - the historically constitutable cinematic statements - functions with and in the set of apparatuses of representation at work in a society. There are not only the representations produced by the representative apparatuses as such (painting, theater, cinema, etc.); there are also, participating in the movement of the whole, the systems of the delegation of power (political representation), the ceaseless working-up of social imaginaries (historical, ideological representations) and a large part, even, of the modes of relational behavior (balances of power, confrontations, maneuvers of seduction, strategies of defense, marking of differences or affiliations). On the other hand, but at the same time, the hypothesis would be that a society is only such in that it is *driven by representation*. If the social machine manufactures representations, it also manufactures *itself* from representations - the latter operative at once as means, matter, and condition of sociality.

Thus the historical variation of cinematic techniques, their appearance/disappearance, their phases of convergence, their periods of dominance and decline seem to me to depend not on a rational-linear order of technological perfectibility nor an autonomous instance of scientific "progress," but much rather on the offsettings, adjustments, arrangements carried out by a social configuration in order to represent itself, that is, at once to grasp itself, identify itself, and itself produce itself in its representation.

What happened with the invention of cinema? It was not sufficient that it be technically feasible it was not sufficient that a camera, a projector

, a strip of images be technically ready.' Moreover, they were already there, more or less ready, more or less invented, a long time already before the formal invention of cinema, 50 years before Edison and the Lumie're brothers. It was necessary that something else be constituted, that something else be formed: the *cinema machine*, which is not essentially the camera, the film, the projector, which is not merely a combination of instruments, apparatuses, techniques. Which is a machine: a *dispositif* articulating between different sets - technological certainly, but also economic and ideological. A *dispositif* was required which implicates its motivations, which is the arrangement of demands, desires, fantasies, speculations (in the two senses of commerce and the imaginary): an arrangement which gives apparatus and techniques a social status and function.

The cinema is born immediately as a social machine, and thus not from the sole invention of its equipment but rather from the experimental supposition and verification, from the anticipation and confirmation of its *social profitability*: economic, ideological, and symbolic. One could just as well propose that it is the spectators who invent cinema: the chain that knots together the waiting queues, the money paid, and the spectators' looks filled with admiration. "Never," say Gilles Deleuze and Claire Parnet, "is an arrangement combination technological, indeed it is always the contrary. The tools always presuppose a machine, and the machine is always social before it is technical. There is always a social machine which selects or assigns the technical elements used. A tool, an instrument, remains marginal or little used for as long as the social machine or the collective arrangement-combination capable of taking it in its *phylum* does not exist."2 The hundreds of little machines in the nineteenth century destined for a more or less clumsy reproduction of the image and the movement of life are picked up in this "phylum" of the great representative machine, in that zone of attraction, lineage, influences that is created by the displacement of the social coordinates of analogical representation.

The second half of the nineteenth century lives in a sort of frenzy of the visible. It is, of course, the effect of the social multiplication of images: ever wider distribution of illustrated papers, waves of prints, caricatures, etc. The effect also, however, of something of a geographical extension of the field of the visible and the representable: by journeys, explorations, colonizations, the whole world becomes visible at the same time that it becomes appropriable. Similarly, there is a visibility of the expansion of industrialism, of the transformations of the landscape, of the production of towns and metropolises. There is, again, the development of the mechanical manufacture of objects which determines by a faultless force of repetition their ever identical reproduction, thus standardizing the idea of the (artisanal) copy into that of the (industrial) series. Thanks to the same principles of mechanical repetition, the movements of men and animals become in some sort more visible than they had been: movement becomes a visible mechanics. The mechanical opens out and multiplies the visible, and between them is established a complicity all the stronger in that the codes of analogical figuration slip irresistibly from painting to photography and then from the latter to cinematography,

At the very same time that it is thus fascinated and gratified by the multiplicity of scopic instruments which lay a thousand views beneath its gaze, the human eye loses its immemorial privilege; the mechanical eye of the photographic machine now sees in its place, and in certain aspects with more sureness. The photograph stands as at once the triumph and the grave of the eye. There is a violent decentering of the place of mastery in which since the Renaissance the look had come to reign; to which testifies, in my opinion, the return, synchronous with the

rise of photography, of everything that the legislation of the classic optics -that geometrical *ratio* which made of the eye the point of convergence and centering of the perspective rays of the visible - had long repressed and which hardly remained other than in the controlled form of anamorphoses: the massive return to the front of the stage of the optical aberrations, allusions, dissolutions. Light becomes less obvious, sets itself as problem and challenge to sight. A whole host of inventors, lecturers, and image showmen experiment and exploit in every way the optical phenomena which appear irrational from the standpoint of the established science (refraction, mirages, spectrum, diffraction, interferences, retinal persistence, etc.). Precisely, a new conception of light is put together, in which the notion of wave replaces that of ray and puts an end to the schema of rectilinear propagation, in which optics thus overturned is now coupled with a chemistry of light.

Decentered, in panic, thrown into confusion by all this new magic of the visible, the human eye finds itself affected with a series of *hrm** ts and doubts. The mechanical eye, the photographic lens, while

it intrigues and fascinates, functions also as a *guarantor* of the identity of the visible with the normality of vision. If the photographic illusion, as later the cinematographic illusion, fully gratifies the spectator's taste for delusion, it also reassures him or her in that the delusion is in conformity with the norm of visual perception. The mechanical magic of the analogical representation of the visible is accomplished and articulated from a doubt as to the fidelity of human vision, and more widely as to the truth of sensory impressions.

I wonder if it is not from this, from this lack to be filled, that could have come the extreme eagerness of the first spectators to *recognize* in the images of the first films,

devoid of color, nuance, fluidity - the identical image, the double of life itself. If there is not in the very principle of representation, a force of disavowal which gives free rein to an analogical illusion that is yet only weakly manifested by the iconic signifiers themselves? If it was not necessary at these first shows to forcefully deny the manifest difference between the filmic image and the retinal image in order to be assured of a new hold on the visible, subject in turn to the law of mechanical reproduction.

THE CAMERA SEEN

The camera, then.

For it is here indeed, on this *camera-site*, that a confrontation occurs between two discourses: one which locates cinematic technology in ideology, the other which locates it in science. Note that whether we are told that what is essential in the technical equipment which serves to produce a film has its founding origin in a network of scientific knowledge or whether we are told that that equipment is governed by the ideological representations and demands dominant at the time it was perfected, in both cases discourse of technicians on the one hand, attempts to elaborate a materialist theory of the cinema on the other - the example given is *always* that which produces the cinematic *image*, and it *alone*, considered from the sole point of view

of OptICS.3

Thus what is in question is a certain *40image* of the camera: metonymically, it represents the whole of cinema technology, it is the part for the whole. It is brought forward as the *visible part* for the *whole of the technics*. This symptomatic displacement must be examined in the very manner of posing the articulation of the couple Technology/Ideology.

To elect the camera as "delegated" representative of the whole of cinematic equipment is not merely synecdochical (the part for the whole). It is above all an operation of reduction (of the whole to the part), to be questioned in that, *theoretically*, it reproduces and confirms the split which is ceaselessly marked in the technical practice of cinema (not only in the practice of film-makers and technicians and in the spontaneous ideology of that practice; but also in the "Ideal 11 the ideological re-resentation that spectators have of work in cinema: concentration on shooting and

p p

studio, occultation of laboratory and editing) between the *visible* part of the technology of cinema (camera, shooting, crew, lighting, screen) and its "*invisible*" part (black between frames, chemical processing, baths and laboratory work, negative film,

director, etc.), the latter repressed by the cuts and joins of editing, sound track, projector, generally relegated to the realm of the unthought, the "unconscious" of cinema. It is symptomatic,

for example, that Lebel, so concerned to assert the scientific regulation of cinema, thinks to deduce it only from geometrical optics, mentioning only once retinal persistence which nevertheless is what brings into play the specific difference between cinema and photography, the synthesis of movement (and the scientific work which made it possible); at the same time that he quite simply forgets the other patron science of cinema and photography, photochemistry, without which the camera would be no more precisely than a *camera obscura*. As for Pleynet's remarks, they apply indiscriminately to the quattrocento *camera obscura*, the seventeenth-century magic lantern, the various projection apparatus ancestors of the *cinematographe* and the photographic apparatus. Their interest is evidently to indicate the links that relate these diverse perspective mechanisms and the camera, but in so doing they risk not seeing exactly what the camera hides (it does not hide its lens): the film and its feed systems, the emulsion, the frame lines, things which are essential (not just the lens) to cinema, without which there would be no cinema.

Hence it is not certain that what is habitually the case in practice should be reproduced in theory: the reduction of the hidden part of technics to its- visible part brings with it the risk renewing the domination of the visible, that *ideology of the visible* (and what it implies: masking, effacement of work) defined by Serge Daney:

Cinema postulated that from the 'real' to the visual and from the visual to its filmed

product' truth was 'infinitely reflected, without distortion or loss. In a world

reproduction a same | |

where 'I see' is readily used for 'I understand: one conceives that such a dream had nothing

fortuitous about it, the dominant ideology - that which equates the real with the

visible - having every interest in encouraging it. . . . But why not, going further back still, call into question what both serves and precedes the camera: a truly blind

confidence in the visible, the hegemony, gradually acquired, of the eye over the other

senses, the taste and need a society has to put itself in spectacle, etc....

The cinema

is thus bound up with the Western metaphysical tradition of seeing and vision whose

photological vocation it realizes. What is photology, what could be the discourse of light?

Assuredly a teleological discourse if it is true, as Derrida says, that teleology 'consists in

neutralizing duration and force in favor of the illusion of simultaneity and

form.'4

Undeniably, it was this "hegemony of the eye," this secularization, this ideology of the visible linked to Western logocentrism that Pleynet was aiming at when stressing the pregnancy of the quattrocento perspective code in the basic apparatus: the image produced by the camera cannot do otherwise than confirm and reduplicate "the code of specular vision such as it is defined by the renaissance humallism," such that the human eye is at the center of the system of representation, with that centrality at once excluding any other representative system, assuring the eye's domination over any other organ of the senses and putting the eye in a strictly divine place (Humanism's critique of Christianity).

Thus is constituted this situation of *theoretical paradox*: that it is by identifying the donlination of the camera (of the visible) over the whole of the technology of cinema which it is supposed to represent , inform, and program (its function as *modeo* that the attempt is made to denounce the submission of that camera, in its conception and its construction, to the dominant ideology of the visible.

If the gesture privileging the camera in order to set out from it the ideological chain in which cinema is inscribed is theoretically grounded by everything that is implied in that apparatus, as in any, case by the determining and principal role of the camera in the production of the film, it too win nevertheless remain caught in the same chain unless taken further. It is therefore necessary to change perspective, that is, to take into account what the gesture picking out the camera sets aside in its movement, in order to avoid that the stress on the camera - necessary and productive - is not reinscribed in the very ideology to which it points.

It seems to me that a materialist theory of the cinema must at once disengage the ideological "heritage" of the camera Oust as much as its "scientific heritage," for the two, contrary to what seems to be stated by Lebel, are in no way exclusive of one another) and the ideological investments in that camera, since neither in the production of films nor in the history of the invention of cinema is the camera alone at issue; if it is the fact that what the camera brings into play of technology, of science and/or ideology is determining, this is so only in relation to other determining elements which may certainly be secondary relative to the camera but the *secondariness* of which must then be questioned: the status and the function of what is covered over by the camera.

To underline again the risk entailed in making cinema function theoretically entirely on the *reduced model* of the camera, it is enough to note the almost total lack of theoretical work on the sound track or on laboratory techniques (as if the

sight of light - geometrical optics - had blocked its work: the chemistry of light) a lack which can only be explained by the dominance of the visible at the heart of both cinematic practice and reflection. Is it not time, for example, to bring out the ideological function of two techniques (instruments + processes + knowledges + practice - interdependent)? Together to realize an aim, an objective which henceforth constitutes that technique, founds, and authorizes it both of which are on the side of the hidden, the cinematic unthought (except by very few filmmakers: Godard, Rivette, Straub): *grading* and *mixing*?

COVERING OVER AND LOSS OF DEPTH OF FIELD

No more than in the case of the "close-up" is it possible to postulate a continuous chain (a filiation) of "depth-of-field shots" running through the "history of cinema." No more than in the case of the "close-up" (or of any other term of cinematic practice and technical metalanguage) is the history of this technical disposition possible without considering determinations that are *not exactly technical* but economic and ideological: determinations which thus go beyond the simple realm of the cinematic, working it over with series of supplements, grasping it on other scenes, having other scenes inscribe themselves on that of cinema. Which shatter the fiction of an autonomous history of cinema (of its "styles and techniques"). Which affect the complex articulation of this field and this history with other fields, other histories. Which thus allow the taking into account, here for the particular technical procedure of depth of field, of the regulation of the functions it assumes - that is to say, of the *meanings* it assumes - in filmic signifying production through codes that are not necessarily cinematic (in this instance: pictorial, theatrical, photographic), and allow the taking into account of the (economic /ideological) forces which put pressure for or against the inscription of this regulation and these codes.

For historian-aestheticians like Mitry and theoreticians like Bazin to have let themselves fall for a determination of filmic writing and of the evolution of cinematic language by the advances of technology (development and improvement of means), to fall, that is, for the idea of a "treasure house" of techniques into which filmmakers could "freely" dip according to the effects of writing sought, or, again, for an "availability" of technical processes which located them in some region outside of systems of meaning (histories, codes, ideologies) and "ready" to enter into the signifying production, it was necessary that the whole technical apparatus of cinema seem so "natural" to them, so "self-evident," that the question of its utility and its purpose (what is it used for) be totally obscured by that of its utilization (how to use it).

It is indeed of "strength of conviction," "naturalness" - and, as a corollary, of the blindness on the part of the theoreticians - that we must talk. Mitry, for example, who notes the fact that deep focus, almost constantly used in the early years of cinema, disappears from the scene of filmic signifiers, for some 20 years (with a few odd exceptions: certain films by Renoir), offers strictly technical reasons as sole explanation for this abandonment - hence establishing technology as the last instance, constituting a closed and autonomous circuit within which technical fluctuations are taken as determined only by other technical fluctuations.

From the very first films, the cinematic image was "naturally" an image in deep focus; the majority of the films of Lumière and his cameramen bear witness to that depth which appears as constituent of these images. It is in fact most often in out-of-doors shooting that depth in the period finds its field. The reason is

indisputably of a technical nature: the lenses used before 1915 were, Mitry stresses, "solely *f*35 and *f*50," "medium" focal lengths which had to be stopped down in order to produce an image in depth, thus necessitating a great deal of light, something to be found more easily and cheaply outside than in the studio.

One must then ask why, precisely, these "medium" focal lengths were only in use during the first 20 years of cinema. I can see no more pertinent reason than the fact that they restore the spatial proportions corresponding to "normal vision" and that they thereby play their role in the production of the impression of reality to which the *cinematographe* owed its success. These lenses themselves are thus dictated by the codes of analogy and realism (other codes corresponding to

other social demands would have produced other types of lenses). The depth of field that they permit is thus also that which permits them, that which lays the ground for their utilization and their

existence. The deep focus in question is not a supplementary "effect" which might just as well have been done without; on the contrary, it is what *had* to be obtained and

what it was necessary to strive to produce. Set up to put its money on, and putting its money wholeheartedly on, the identification - the desire to identify, to duplicate, to recognize specularly - of the cinematic image with "life itself" (consider the fantastic efforts expended over decades by hundreds of inventors in search of "total cinema, ~9 of

complete illusion, the reproduction of life with sound and color and relief included), the ideological apparatus cinema could not, in default of realizing in practice the

technical patent for relief, neglect the production of effects of relief, of effects of depth. Effects which are due on the one hand to the inscription within the image of a vanishing perspective and on the other to the movements of people or other mobile elements (the La Clotat train) along vanishing lines (something which a photograph

cannot provide, nor *ajortiori* a painting; which is why the most perfect *trompe l'oeil* minutely constructed in conformity with the laws of perspective is powerless to trick the eye). The two are linked: in order that people can move about "perpendicularly" on the screen, the light must be able to go and take them there, it requires a depth,

planes spaced out, in short, the code of artificial perspective. Moreover in studio filming, where space was relatively tight and lighting not always adequate, the

backgrounds were often precisely painted *trompe l'oeil* canvases which, while unable to inscribe the movement in depth of the characters, at least inscribed its perspective.

We know what perspective brings with it and thus what deep focus brings into the cinematic image as its *constitutive codes*: the codes of classic Western representation,

pictorial and theatrical. M6he's, specialist in "illusion" and interior shooting, said as early as 1897 of his Montreuil '6 studio": "In brief, it is the coming together of a gigantic

photographic workshop and a theatrical stage No more exact indication could be given of the double background on which the cinematic image is raised, and not

fortuitously but explicitly, deliberately. Not only is deep focus in the early cinematic image the mark of its submission to these codes of representation and to the histories

and ideologies which necessarily determine and operate them, but more generally it signals that the ideological apparatus cinema is itself produced by these codes and by

these systems of representation, as at once their complement, their perfectionment, and the surpassing of them. There is nothing accidental, therefore, or specifically technical in the cinematic image immediately claiming depth, since it is just this depth which governs and informs it; the various optical instruments are regulated according to the possibility of restoring depth. Contrary to what the technicians seem to believe, the restoration of movement and depth are not effects of the camera; it is the camera which is the effect, the solution to the problem of that restoration.

Deep focus was not "in fashion" in 1986, it was one of the factors of credibility in the cinematic image (like, even if not quite with the same grounds, the faithful reproduction of movement and figurative analogy). And it is by the transformation of the conditions of this credibility, by the displacement of the codes of cinematic

verisimilitude from the plane of the impression of reality alone to the more complex planes of fictional logic (narrative codes), of psychological verisimilitude, of the impression of homogeneity and continuity (the coherent space-time classical drama) that one can account for the effacement of depth. It will not then be a question merely of technical "delays": such "delays" are themselves caught up in

and effects of the displacement, of this replacement of codes.

It seems surprising indeed (at least if one remains at the level of "technical causes") that a process which "naturally" dominated a large proportion of the films made between 1895 and 1925 could disappear or drop into oblivion for so long without leaving aside a few exceptions, Renoir being one-filmmakers showing the slightest concern (so it seems).

Everything, Mitry assures us, stems from "the generalization of panchromatic stock round about 1925." Agreed. But to say that - offered with the weight of

the obvious - and to pass on quickly to the unsuitability of the lighting systems to the spectrum of this emulsion is exactly not to say what necessity attaches to this "generalization," what (new) function the new film comes to fulfill that the old was unable to serve. It is to avoid the question as to what demands the replacement of an emulsion

ni* if I in universal use and which (if we follow Mitry) did not seem so mediocre by another which (still according to Mitry) was far from its immediate equal. As far as we know, it is not exactly within the logic of technology, nor within that of the economics of the film industry (in the mid-twenties already highly structured and well equipped) to adopt (or impose) a new product which in an initial moment poses more problems than the old and hence incurs the expense of adaptation (modification of lighting systems, lenses, etc.) *without somewhere finding something to its advantage and profit.*

In fact, it is a matter not simply of a gain in the sensitivity of the film but also of a gain in *faithfulness* "to natural colors," a *gain in realism*. The cinematic image becomes more refined, perfects its

"rendering," competes once again with the quality of the photographic image which had long been using the panchromatic emulsion. The reason for this "technical progress" is not merely technical, it is ideological: it is not so much greater sensitivity to light which counts as "being more true." The hard, contrasty image of the early cinema no longer satisfied the codes of photographic realism developed and sharpened by the spread of photography. In my view, depth (perspective) loses its importance in the production of "reality effects" in favor of shade, range, color. But this is not all.

A further advantage, that is, that the film industry could find "round about 1925" in imposing on itself - despite the practical difficulties and the cost of the operation - the replacement of orthochromatic by panchromatic stock depends again on the greater sensitivity of the latter. Not only did the gain in sensitivity permit the realignment of the "realism" of the cinematic image with that of the photographic image, it also compensated for the loss of light due to the change from a shutter speed of 16 or 18 frames per second to the speed of 24 frames per second necessitated by sound. This "better" technical explanation, however, can only serve here to re-mark the coincidence of the coming of the talkie and the setting aside of depth, not to provide the reason for it. Although certain of its effects are, that reason is not technical. More than one sound film before *Citizen Kane* works with depth; the generalization of large aperture lenses even does not exclude its possibility: with the sensitivity of emulsions increasing and the quantity of light affordable, there was nothing to prevent - technically - the stopping down of these lenses (if indeed, as Renoir did, one could not find any others). So it is not as final "technical cause" that the talking picture must be brought into the argument; it is in that in a precise location of production - distribution (Hollywood) - it remodels not just the systems of filmic writing but, also the ideological function of the cinema and the economic facts of its functioning.

It is not unimportant that it be - in Hollywood - at the moment when the rendering of the cinematic image becomes subtle, opens up to the shades of grays (monochrome translation of the range of colors), thus drawing nearer to a more faithful imitation of photographic images promoted (fetished) as the very norms of realism, that speech and the speaking Subject come onto the scene. As soon as they are produced, sound and speech are plebiscited as *the 'truth' which was lacking* in the silent film - the truth which is all of a sudden noticed, not without alarm and resistance, as having been lacking in the silent film. And at once this truth renders no longer valid all films which do not possess it, which do not produce it. The decisive supplement, the "ballast of reality" (Bazin) constituted by sound and speech intervenes straightaway, therefore, as *perfectionment and redefinition of the impression of reality*.

It is at the cost of a series of blindnesses (of disavowals) that the silent image

was able to be taken for the reflection, the objective double of "life itself": disavowal of color, relief, sound. Founded on these lacks (as any representation is founded on a lack which governs it, a lack which is the very principle of any simulacrum: the spectator is anyhow well aware of the artifice but he/she prefers all the same to believe in it), filmic representation could find its production only by working to diminish its effects, to mask its very reality. Otherwise it would have been rejected as too visibly factitious: it was absolutely necessary that it facilitate the disavowal of the veritable sensory castrations which founded its specificity and that it not, by remarking them, prevent such disavowal. *Compromises* were necessary in order that the cinema could function as ideological apparatus, in order that its delusion could take place.

The work of suffering, of filling in, of patching up the lacks which ceaselessly recalled the radical difference of the cinematic image was not done all at one go but piece by piece, by the *patient accumulation of technical processes*. Directly and totally programmed by the ideology of resemblance, of the "objective" duplication of a "real" itself conceived as specular reflection, cinema technology occupied itself in improving and refining the initial imperfect *dispositif*, *always* imperfect by virtue of the ideological delusion produced by the film as "impression of reality." The lack of relief had been immediately compensated for (this is the original impression of reality) by movement and the depth of the image, inscribing the perspective code which in Western cultures stands as principal emblem of spatial relief. The lack of color had to make do with panchromatic stock, pending the commercialization of three-color processes (1935-1940). Neither the pianos nor the orchestras of the silent film could really substitute for "realistic sound": synchronized speech and sound -in spite of their imperfections, in truth of little weight at a time when it is the whole of sound reproduction, records, radios, which is affected by background noise and interference -thus considerably *displace the site and the means (until then strictly iconic)* of the production of the impression of reality.

Because the *ideological* conditions of production-consumption of the initial impression of reality (figurative analogy + movement + perspective) were changing (if only in function of the very dissemination of photo and film), it was necessary to tinker with its technical modalities in order that the act of disavowal renewing the deception could continue to be accomplished "automatically," in a reflex manner, without any disturbance of the spectacle, above all without any work or effort on the part of the spectator. The succession of technical advances cannot be read, in the manner of Bazin, as the progress towards a "realism plus" other than in that they accuniulape realistic in

supplements which all aim at reproducing -in strengthen' 9. diversifying, rendering more subtle - the impression of reality; which aim, that is, to reduce as much as possible, to minimize the gap which the "yes-I-know/but-all-the-same" has to fill.

What is at stake in deep focus, what is at stake in the historicity of the technique, are the codes and the modes of production of "realism," the transmission, renewal, or transformation of the ideological systems of recognition, specularity, and truth-to-lifeness. El

THE WORK OF CULTURE
IN THE AGE OF
CYBERNETIC SYSTEMS

Bill Nichols

The computer is more than an object: it is also an icon and a metaphor that suggests new ways of thinking about ourselves and our environment, new ways of constructing images of what it means to be human and to live in a humanoid world. Cybernetic systems include an entire array of machines and apparatuses that exhibit computational power. Such systems contain a dynamic, even if limited, quotient of intelligence. Telephone networks, communication satellites, radar systems, programmable laser video disks, robots, biogenetically engineered cells, rocket guidance systems, videotex networks -all exhibit a capacity to process information and execute actions. They are all "cybernetic" in that they are selfregulating mechanisms or systems within predefined limits and in relation to predefined tasks. Just as the camera has come to symbolize the entirety of the photographic and cinematic processes, the computer has come to symbolize the entire spectrum of networks, systems, and devices that exemplify cybernetic or "automated but intelligent" behavior.

This article traverses a field of inquiry that Walter Benjamin has crossed before, most notably in his 1936 essay, "The Work of Art in the Age of Mechanical Reproduction." My intention, in fact, is to carry Benjamin's inquiry forward and to ask how cybernetic systems, symbolized by the computer, represent a set of transformations in our conception of and relation to self and reality of a magnitude commensurate with the transformations in the conception of and relation to self and reality wrought by mechanical reproduction and symbolized by the camera. This intention necessarily encounters the dilemma of a profound ambivalence directed toward that which constitutes our imaginary Other, in this case not a mothering parent but those systems of artificial intelligence I have set out to examine here. Such ambivalence certainly permeates Benjamin's essay and is at best dialectical, and at worst, simply contradictory. Put more positively, those systems against which we test and measure the boundaries of our own identity require subjection to a double hermeneutic of suspicion and revelation in which we must acknowledge the negative, currently dominant tendency toward control, and the positive, more latent potential toward collectivity.' It will be in terms of law that the dominance of control over collectivity can be most vividly analyzed.

In summary, what I want to do is recall a few of the salient points in Benjamin's original essay, contrast characteristics of cybernetic systems with those of mechanical reproduction, establish a central metaphor with which to understand these cybernetic systems, and then ask how this metaphor acquires the force of the real-how different institutions legitimate their practices, recalibrate their rationale, and modulate their image in light of this metaphor. In particular, I want to ask how the preoccupations of a cybernetic

imagination have gained institutional legitimacy in areas such as the law. In this case, like others, a tension can be seen to exist between the liberating potential of the cybernetic imagination and the ideological tendency to preserve the existing form of social relations. I will focus on the work of culture - its processes, operations, and procedures - and I will assume that culture is of the essence: I include within it text and practices, art and actions that give concrete embodiment to the relation we have to existing conditions to a dominant mode of production, and the various relations of production it sustains. Language, discourse, and messages are central. Their style and rhetoric are basic. Around each "fact" and every "datum," all realities and evidence, everything "out there," a persuasive, affective tissue of discourse accrues. It is in and through this signifying tissue, arranged in discursive formations and institutional arenas, that struggle takes place and sermiosis occurs.

VIDEO, NETWORKS, AND ARCHITECTURE

Some Physical Realities of Electronic Space

Kathy Rae Huffman

A form of architecture can now be located within video and computer technology. It is electronic volume, a phenomenon that also provides cohesion for radical artistic communication practices. This is intelligent space! It defines information as site, especially as it informs the influence of experimental art and the fundamental discourse relevant to the reality of data space. The expanded redefinition of the virtual as real has been reconstructed by traditional communication practices such as radio, telephone, and television, and their manifest contemporary forms in electronic network environments and their evolving multimedia network applications. These spatial expressions employ electronics not only to decode the transparencies inherent in the video and computer images we normally observe, but in this case they are also used to define the physical, navigable properties of electronic data space itself. In an obvious contradiction, these spaces are conceptually embedded in the intelligent mechanisms that exist independently of what is visible on the surface of an electronic screen. This spatial transparency, which as Virilio notes has long supplanted appearances,¹ takes on physical dimensions of a new order at this point because the representation of overlapping physical and electronic realities can now be readily constructed, observed, and experienced in convenient formats.

Equally important in a discussion of an electronically created terrain and virtual architecture is the consideration of the critical and theoretical discourse that connects video, informatics, and the geography of space.² These concerns, which have evolved during the past three decades of practical experience, research, and observation by artists using the new media of their era, are the direct consequence of the exploration of the media's potential, including the investigation of the altered and elaborated electronic image. Likewise, the rapid advancement of the understanding of information networks underscores a completely new phenomena: the traceable grid that exists in electronic space. A revolutionary new understanding of this volume is a result of what once seemed to be an impossibility: the representation of depth in the electronic frame. But, according to

Deleuze, impossible ideas from one medium often translate to another, because a creator who is not seized at the throat by a set of

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impossibilities is no creator. A creator is someone who creates his own impossibilities, and thereby creates possibilities.³ Network communication and navigation now transcend the political understanding of boundaries, and a travel route can also be understood as the trajectory of movement into experiential trails of electronic memory. The radical shift of understanding towards the idea of media volume is a revised understanding of space.

The experiences of artists and technicians, throughout the history of video and multimedia technology, has advanced the understanding of how the viewing of something progresses from the metaphysical, or psychological act, toward a perceptual understanding complete with physical experience and comprehension. This

experiential phenomena translates into an awareness of how images function on various levels of the communication scale. The online real-time exercise in the simultaneous transmission of ideas functions as an example of the numerous

communication energies and impulses crowding earth's airwaves, outerspace, and the universe. In our real-world environment, we participate in the network of intense frequencies that intrude into - and upon the rhythm of the human body. Both

tangible and intangible effects of this information bombardment are physically evidenced. As invisible phenomena, this is media information portrayed by way of digital decoding, and analogue visualization processes. In a selection of video for the exhibition "Intelligente Ambiente/Intelligent Environments,"⁴ an attempt is made to create a new awareness of these mysterious communication media as a new epistemological space: a real space that combines video and computer technology with theoretical and practical issues of architecture and appearances.⁵

ARCHITECTURE AND COMMUNICATION

The intrusion of media in today's urban environment is overwhelmingly apparent as a system of electronic space mapping. These abstract functions range from real surveillance mechanisms, to the analysis of how traffic moves, or how design

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functions in physical space. We have grown accustomed to these systems, which are ongoing, and are always quietly at work. The next generation of communication technologies will require more advanced, conceptual ability to receive and perceive abbreviated language, as bits of images from commercial and authoritative sources. This information will involve the physical and psychological immersion into electronic advertising, official regulations, and state propaganda. Therefore, the necessity to expand the creative expressions of environmental electronic architecture is a developing concern of designers. The alternative, unrestricted exploration of multimedia artists is of real value to urban planners, architects who are socially concerned with the numerous electronic augmentations and configurations of natural space.

This cinematic phenomena, previously known and visually translated as the genre of architecture on film dates back to the beginning of experimental film-making at the turn of the century. By tradition, this activity was primarily an interpretive look into spaces and structures, and the early films made by architects, sometimes in collaboration with filmmakers, primarily analyzed architectural forms. As a genre of documents, these films preserve valuable images of structures threatened or lost through time, war, or renovation. As conceptual statements and observational

practices, the favorite filmed subjects included cities, housing projects, highway systems, landscapes, and workplaces. The effect of these film studies on contemporary architecture has been strong, and the relationship between the two is a powerful precedent for today's new media concerns. In fact, in an interaction between film and architecture, it has been noted that architecture does not merely put forward prospects for viewing. Rather it creates energy spaces with which the cinematic interfere, so as to gain its own topology in loco. The cinema will grow so enormously that the architectural itself will begin to charge itself with cinematic forces 6

ELECTRONIC MEMORIES

The consumer video boom of the 1980s propelled ordinary folks to purchase Super 8 home movie cameras or, a little later, VHS video recorders. These home recorders made it possible to discover how to see and experience space differently, and began the accumulation of an entirely distinct set of memories that were experienced differently from the preceding generations' memories - in large part because of the ability to replay recordings of personal events instantaneously. With the endless opportunities to document life around them during the past decade, individuals have become so familiar with the act of observing space and time - in electronic form - that the medium has become infused with new meanings and opportunities to understand the self and others. Video, which portrays these moments without judgment, or the filter of emotion, reflects them as ordinary memories in a continuously moving, and thoroughly integrated, picture of reality. Created from an

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electronic light source that overlaps and juxtaposes the now-famililar memory-images in new combinations - unnatural in physical life but familiar in the state of video - the encountering of the electronic memory as reality has become commonplace. The resulting commercial mass consumption of mega-information, which is supposed to be by everyone and for everyone is, in reality, the art of being

everywhere while really being nowhere. A question is the degree to which individuals will continue to affect and establish the real space of network environments, neighborhoods, and communities. A witness and transmutation of representation, the emergence of forms as volumes destined to persist as long as their

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materials would allow has given way to images whose duration is purely retinal.

VIDEO, INSTALLATION, AND PSYCHOLOGICAL SPACE

Videotape provided a breakthrough in the understanding of the relationship between artistic image making, space, and perception. of oneself. In the mid- 1970s, when video first began to be used widely by the first generation of video pioneers, these artists, coming from various creative fields, explored new ways to examine the technology

and to observe themselves simultaneously in personal and public space.⁸ Video was a rejection of the frozen moments in time most familiar to artists, in which temporal space was painted atmosphere or a mood captured in a photograph. The video medium was a statement against consumerism, against the art market, and toward a communication practice that involved

community and consciousness. In the earliest actual practice, video was used in the same way as surveillance devices are today, it was employed to keep watch over and to observe reality. Much of this video research material remains unedited - and unwatched. It was, however, a valuable experience that facilitated artists' understanding of electronic space, memory, and video's ability

to document experience in real time. Towards these goals, many artists created sophisticated settings in which a prepared physical environment was integral to the

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understanding of the electronic space being created with video technology. This act -creating electronic territory and involving the viewer in it as a physical entity -is a direct predecessor to contemporary, interactive multimedia art, and immersive technology. Installation artists introduced strong concepts of both psychological and physiological territory, and advanced an awareness of extended boundaries, and an electronic ability to define space, time, and energy.

LIVE TELEVISION EXPERIMENTS BEING TOGETHER IN ELECTRONIC SPACE

Television experience has extended the territory of the home and the sensibilities of its inhabitants. Like radio and the telephone, its direct-indirect capabilities were, on the one hand, all-pervasive yet for the most part uncontrollable. As a private/public space, television was often referred to as a window on the world - a phrase now understood more clearly for its political-commercial context and as a control mechanism for the public than as a method to gain cultural information. In television terms, information,, cultural standards, and trend setting is big business, and the subject of culture is generally connected with research into its effective control.The explorations of television space by artists from the 1960s include live and interactive experimental events that allude to a real space, but were actually created as an alternative television space that connected, or allowed communication, between sites. Live television and satellite performances were designed to combine two or more places. Spaces were first attempted by artists under the concept of event and spectacle. Interactive and live broadcasts were, however, usually closed circuit, or broadcast to a limited number of homes or limited market, as broadcasters normally refer to the viewers. The earliest television experiments were possible only because they were not considered to be important, because broadcasters considered art to be a neutral subject, and for public and cable television, the artist held a special position, much like that of a researcher.⁹

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For telecommunications, coming together in time means, inversely, distancing oneself in space.¹⁰

Many of the early television projects were at the time called interactive but were actually performances held in more than one location to attempt mutuality of time and space from different locations.These connections between spaces were often accompanied by theoretical subtexts on mass communication, and the political issue surrounding the control of information by broadcasters. Even now, in the context of advanced computer technology, some of the early live historic television transmissions stand up as seminal works, integral to the communication industry's acceptance of art and technology. Douglas Davis, Allen Kaprow, and Nam June Palk were three primary artists who experimented by creating the first live and interactive television events, first dating from 1968, and continuing into the early 1970s, on WGBH television, Boston's public television station and on PBS WNET 13, in New York City. Other experiments were conducted on the West Coast at KQED, the San Francisco public television station. The archeology of artist's broadcast work ⁷ including radio, television, telephone, and various communication networks, continues to be compiled and examined. Important keys to an interrelated history of the cultural and individual vitality of seeing electronic images and spaces will be revealed in the analysis of this history.

The 1990s introduced a relatively new concept of the interactive/ digital television environment. The first of the artistic experimental electronic networks featured direct access to the communication system from home by way of the common communication interface: the telephone. The capabilities exist for multimedia exploration of the television and information networks, the specific architectural forms and realities created by electronics. As physical places, three contemporary references include: Piazza Virtuale the Ponton European Media Art Labs interactive computer environment for live television (broadcast for 100 continuous days from the Documenta IX), which featured Picturephone ISDN connections, telephone keypad-controlled games and activities, and chat programs using modems, FAX, telephone and live entry-points; the interactive television space Yorb World, an interactive community cable television program developed at New York University, in which a little world can be explored by viewers using the telephone keypad; and the Electronic Cafe, a real site that connects participants in point-to-point communication from various sites around the world in conversations, poetry, and communication art. In these examples it is important to recognize that place is still a necessary space, but architecture can no longer be bound by the static conditions of locally defined place, here or there, but as architecture in data space."

In the mediated virtual world, there are no longer fixed places in the sense that we once knew them. Architecture must now address the problem of the event, and even rock concerts may be considered the archetypal form for an architectural event.¹² If, as Peter Eisenman states, the new architecture is a rock concert, then the ultimate skyscraper of the recent past is the example by U2, with their concert

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tour of ZOO TV, a mobile live satellite spectacle connecting their concert with the broadcast of regular television programs, and the viewers to the concert, by satellite dish and by telephone. And, as a finale and sign-off at the end of each concert, a call is placed to the White House, asking the president for peace, with the background roar of applause and agreement from the thousands of spectators in the live audience. Another example is of course the mBone transmission of the Rolling Stones concert, as a full Internet experience over broad-band systems.

CHECKING OUT DATA SPACE FOR PHYSICAL REALITIES AND SOCIAL PRACTICES

The new electronic territory is media information. This is an invisible architecture without the interface of technology, and it faces new challenges in the public domain. But, it is not a fictional nor simply a virtual environment. Artists, for expressive and theoretical intent, have discovered important lessons about the image and its relationship to this created space, especially as it relates to the vast worldwide Internet territory of seemingly unlimited and compounding information. This space, a potential new shared platform for collaborative artmaking and communication, demands an entirely new use of language, space, and time. And, if we believe Wittgenstein -that language is also a fundamental technology, and not merely a vehicle for expressing thought but the driver of thought - then the new information technologies are doubly important for our future understanding of space and information. Very seriously we must judge how they affect our culture, our lives, our living. As a working space, electronic architecture impacts our creative practices and physical reality - which certainly will bring about new social practices and observed realities.

There are collapsing boundaries and new case histories for representation: "boundary," or "limiting surface" has turned into an osmotic membrane, like a

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blotting pad. Even this definition is more rigorous than earlier ones, and yet it still signals a change in the notion of limitation.¹³ These ideas are urgent challenges for architects and communications experts, who - together with the designers of new formats for information systems - should be collectively recognized as the influential media artists of the late 1990s. The growing public interest in electronic data space, interactive television, and the virtual experience has been compounded by the news media, by its excitement and enthusiastic journalism regarding the large financial investments being made by computer companies, entertainment, television, and public utility systems. It is a crisis of physical dimensions in the mediated world that the practical and theoretical interests, and the information technology itself, have shifted toward multimedia, virtual reality, and cyber-connected networks: all new territories created to explore and to understand spatial realms.

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VIDEO, NETWORKS,
AND ARCHITECTURE

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Kathy Rae Huffman

A form of architecture can now be located within video and computer technology. It is electronic volume, a phenomenon that also provides cohesion for radical artistic communication practices. This is intelligent space! It defines information as site, especially as it informs the influence of experimental art and the fundamental discourse relevant to the reality of data space. The expanded redefinition of the virtual as real has been reconstructed by traditional communication practices such as radio, telephone, and television, and their manifest contemporary forms in electronic network environments and their evolving multimedia network applications. These spatial expressions employ electronics not only to decode the transparencies inherent in the video and computer images we normally observe, but in this case they are also used to define the physical, navigable properties of electronic data space itself. In an obvious contradiction, these spaces are conceptually embedded in the intelligent mechanisms that exist independently of what is visible on the surface of an electronic screen. This spatial transparency, which as Virilio notes has long supplanted appearances,' takes on physical dimensions of a new order at this point because the representation of overlapping physical and electronic realities can now be readily constructed, observed, and experienced in convenient formats.

Equally important in a discussion of an electronically created terrain and virtual architecture is the consideration of the critical and theoretical discourse that connects video, informatics, and the geography of space.² These concerns, which have evolved during the past three decades of practical experience, research, and observation by artists using the new media of their era, are the direct consequence of the exploration of the media's potential, including the investigation of the altered and elaborated electronic image. Likewise, the rapid advancement of the understanding of information networks underscores a completely new phenomena: the traceable grid that exists in electronic space. A revolutionary new understanding of this volume is a result of what once seemed to be an impossibility: the representation of depth in the electronic frame. But, according to Deleuze, impossible ideas from one medium often translate to another, because a creator who is not seized at the throat by a set of

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The consumer video boom of the 1980s propelled ordinary folks to purchase Super 8 home movie cameras or, a little later, VHS video recorders. These home recorders made it possible to discover how to see and experience space differently, and began the accumulation of an entirely distinct set of memories that were experienced differently from the preceding generations' memories - in large part because of the ability to replay recordings of personal events instantaneously. With the endless opportunities to document life around them during the past decade, individuals have become so familiar with the act of observing space and time - in electronic form - that the medium has become infused with new meanings and opportunities to understand the self and others. Video, which portrays these moments without judgment, or the filter of emotion, reflects them as ordinary memories in a continuously moving, and thoroughly integrated, picture of reality. Created from an

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There are collapsing boundaries and new case histories for representation: "boundary," or "limiting surface" has turned into an osmotic membrane, like a

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blotting pad. Even this definition is more rigorous than earlier ones, and yet it still signals a change in the notion of limitation.¹³ These ideas are urgent challenges for architects and communications experts, who - together with the designers of new formats for information systems - should be collectively recognized as the influential media artists of the late 1990s. The growing public interest in electronic data space, interactive television, and the virtual experience has been compounded by the news media, by its excitement and enthusiastic journalism regarding the large financial investments being made by computer companies, entertainment, television, and public utility systems. It is a crisis of physical dimensions in the mediated world that the practical and theoretical

interests, and the information technology itself, have shifted toward multimedia, virtual reality, and cyber-connected networks: all new territories created to explore and to understand spatial realms.
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THE ART OF CYBERSPACE

P i e r r e L e v y

From the point of view of its relationship to artistic works, cyberspace seems to cultivate a field of attraction that can be summed up in three interdependent clauses:

i) Messages are invoked, transmitted, sent back, expelled, drawn in, given this or that scenario depending on different tastes and situations, and whatever form they take, the messages revolve around receptors, which are now located at the center (in contrast to the image presented by the mass media).

2) The established differences between author and reader, performer and spectator, creator and interpreter become blurred and give way to a readingwriting continuum that extends from the designers of technology and networks to the final recipient, each one contributing to the activity of the other (disappearance of the signature).

3) The divisions that separate the messages or "works," which appear as micro territories attributed to "authors," tend to become obliterated. Each and every representation may be subject to sampling, mixing, re-utilization, and so forth. According to the emerging pragmatism of creation and communication, nomadic distributions of information fluctuate in an immense deterritorialized sermiotopic backdrop. It is therefore natural that the creative effort is shifting away from the messages towards the devices, the processes and languages, the dynamic architectures," and environments.

Certain questions that artists have been asking since the end of the nineteenth century are being asked once again, with even greater insistence, with the emergence of cyberspace. These questions directly alter the "framework": the work and its limits, its presentation, reception, reproduction, distribution, interpretation, and the diverse types of separation that they carry. The framework is so altered that it now appears as if no fence will ever contain this deterritorialization *in extremis*: we must leap into a new space. It is the socio-technical environment of the proliferation and distribution of works that has engendered the mutation. Yet can we continue to speak of works in cyberspace?

For at least several centuries, in the West, the artistic phenomenon has presented itself as follows: a person (the artist) signs a particular object or message (the work), which other persons (the recipients, the public, the critics) perceive,

taste, read, interpret, and evaluate. Regardless of the function of the work (religious, decorative, subversive) or its ability to transcend that function and pierce the enigmatic and emotional core within us, it fits into a classic pattern of communication. The sender and the receiver are absolutely distinct, their roles are clearly assigned. The techno-cultural environment that is emerging, however, gives rise to new art forms, ignoring the distinctions between emission and reception, creation, and interpretation. It is only a possibility that has opened up through the current mutation, a possibility that may never materialize or only very marginally. One hopes, above all, to prevent it from closing up prematurely, before it has explored its rich diversity. This new art form allows what is precisely no longer an audience to experience other methods of communication and creation.

Rather than sending out a message to receptors outside the act of creation who are invited to give meaning to the work after the fact, here the artist attempts to establish an environment, an arrangement of communication and production, a collective event which involves the recipients, transforms interpreters into players, and places the interpretation in the same loop as the collective activity. It is entirely possible that "open works" already foreshadow this direction. They remain, however, within the interpretive paradigm. The receivers of the open work are invited to fill in the blanks, to choose between possible directions, to confront the differences in their interpretations. But it is still a question of magnifying and exploring the possibilities of an unfinished monument, of placing one's initials in the honor roll beneath the artist's signature. Indeed, the art of involvement no longer constitutes a work at all, even open or undefined: it causes processes to emerge, it seeks to open up a career to autonomous lives, it invites one to grow and inhabit a world. It places us in a creative cycle, in a living environment in which we are always already co-authors. Work in progress? It shifts the emphasis from work to progress. Its manifestations will relate to moments, places, collective dynamics, but no longer to people. It is an art that bears no signature.

Utilizing all the resources cyberspace offers, the art of involvement discovers the current of music. How do we make a symphony rise from the murmur of a multiple? How do we transform the sound of a crowd into a chorus, without a musical score? The collective intellect continually brings the social contract into play, it keeps the group in a state of renewal. Paradoxically, to do so requires time, the time to involve individuals, to form ties, to make objects appear, and create common landscapes and to return to them. In comparison to the watch or the calendar, the temporality of the collective imagination may seem delayed, interrupted, splintered. Yet it is all played out in the dark, invisible recesses of the collective: the melody, the emotional tonality, the secret pulse, the connections, and continuity that it binds together at the very heart of the individuals of which it is composed.

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THE COMING OF AGE
OF THE FLESH MACHINE

CriticalArtEnsemble

Over the past century, the two machines that comprise the state apparatus have reached a level of sophistication that neither is likely to transcend. These complex mechanisms—the war machine and the sight machine—will go through many generations of refinement in the years to come; for the time being, however, the boundaries of their influence have stabilized.

The war machine is the apparatus of violence engineered to maintain the social, political, and economic relationships that support its continued existence in the world. The war machine consumes the assets of the world in classified rituals of uselessness (for example, missile systems that are designed never to be used, but, rather, to pull competing systems of violence into high-velocity cycles of war-tech production), and in spectacles of hopeless massacre (such as the Gulf War). The history of the war machine has generally been perceived in the West as history itself (although some resistance to this belief began during the nineteenth century). And while the war machine has not followed a unilinear course of progress, due to disruptions by moments of inertia caused by natural disasters or cultural exhaustion, its engines have continued to creep toward realizing the historical construction of becoming the totality of social existence. Now it has reached an unsurpassable peak - a violence of such intensity that species annihilation is not only possible,

but probable. Under these militarized conditions, the human condition becomes one of continuous alarm and preparation for the final moment of collective mortality.

The everpresent counterpart of the war machine is the sight machine. It has two purposes: to mark the space of violent spectacle and sacrifice, and to control the symbolic order. The first task is accomplished through surveying and mapping all varieties of space, from the geographic to the social. Through the development of satellite-based imaging technologies, in combination with computer networks capable of sorting, storing, and retrieving vast amounts of visual information, a wholistic representation has been constructed of the social, political, economic, and geographical landscape(s) that allows for near-perfect surveillance of all areas, from the micro to the macro. Through such visualization techniques, any situation or population deemed unsuitable for perpetuating the war machine can be targeted for sacrifice or for containment.

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The second function of the sight machine, to control the symbolic order, means that the sight machine must generate representations that normalize the state of war in everyday life, and which socialize new generations of individuals into their machinic roles and identities. These representations are produced using a types of imaging technologies -as low-tech as a paint brush and as high-tech as a supercomputer. The images are then distributed through the mass media in a ceaseless barrage of visual stimulation. To make sure that an individual cannot escape the imperatives of the sight machine for a single waking moment, ideological signatures are also deployed through the design and engineering of an artifacts and architectures. This latter strategy is ancient in its origins, but with the velocity and the absence of spatial restrictions in the mass media, the sight machine now has the power to systematically encompass the globe in its spectacle. This is not to say that the world will be homogenized in any specific sense. The machinic sensibility understands that differentiation is both useful and necessary. However, the world will be homogenized in a general sense. Now that the machines are globally and specifically interlinked with the ideology and practices of paricapitalism, we can be certain that a hyper-rationalized cycle of production and consumption, under the authority of nomadic corporate-military control, will become the guiding dynamic of the day. How a given population or territory arrives at this principle will be open to negotiation, and is measured by the extent to which profit (tribute paid to the war machine) increases within a given area or among a given population.

In spite of the great maturity of these machines, a necessary element still seems to be missing. While representation has been globally and rationally encoded with the imperatives of paricapitalism, the flesh upon which these codings are further inscribed has been left to reproduce and develop in a less than instrumental manner. To be sure, the flesh machine has intersected both the sight and war machines since ancient times, but, comparatively speaking, the flesh machine is truly the slowest to evolve. This is particularly true in the West, where practices in health and medicine, genetic engineering, and the development of recombinant organisms have thoroughly intersected with nonrational practices (particularly those of the spirit). Even when they were secularized after the Renaissance, these practices have consistently been less successful, when compared to their counterparts, in insuring the continuance of a given regime of state power. Unlike the war machine and the sight machine, which have accomplished their supreme tasks -the potential for species annihilation for the former, and global mapping and mass distribution of ideologically coded representation for the latter -the flesh machine has utterly failed to concretize its imagined world of global eugenics.

The simple explanation for the flesh machine's startling lack of development is cultural lag. As the West shifted from a feudal to a capitalist economy, rationalizing the benefits of production in regard to war was a relatively simple task. National wealth and border expansion were clearly

marked and blended with the trace leftovers of feudal ideology. Manifest destiny, for example, did not

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stand in contradiction to Christian expansionism. War, economy, politics, and ideology (the slowest of social manifestations to change) were still working toward a common end (total domination). The rationalization of the flesh, however, could not find a point of connection with theologically informed ideology. Flesh ideology could only exist as two parallel rather than as intersecting tracks. For this reason it is no surprise that one of the fathers of flesh-machine ideology was a man of God. The work of Thomas Malthus represents the ideological dilemma presented to the flesh machine on the cusp of the feudal/ capitalist economic shift.

Malthus argued that the flesh did not have to be rationalized through secular engineering, since it was already rationalized by the divine order of the cosmos designed by God Himself. Although the nontotalitarian motivation of original sin would guarantee replication of the work force, God had placed natural checks on the population, so only those who were needed would be produced. The uncivilized lower classes could be encouraged to have as many children as possible without fear that the population would overrun those in God's grace, because God would sort the good from the bad through famine, disease, and other natural catastrophes. For this reason, the flesh could be left to its own means, free of human intervention, and human progress could focus on fruition through economic progress. Spencerian philosophy, arriving half a century later, complemented this notion by suggesting that those fit for survival would be naturally selected in the social realm. The most skillful, intelligent, beautiful, athletic, etc., (whatever traits were desired by the war machine) would be naturally selected by the structure of the society itself - that of "open" capitalist competition. Hence the flesh machine

„was still in no need of vigorous attention; however, Spencer did act as a hinge for the development of eugenic consciousness by constructing an ideological predisposition for conflating natural and social models of selection (the former arrived a decade or so after Spencer's primary theses were published). This made it possible for genetic engineering to become a naturalized social function, intimately tied to social progress without being a perversion of nature - in fact, it was now a part of nature. At this point eugenic consciousness could continue to develop uninterrupted by feudal religious dogma until its traces evaporated out of capitalist economy, or until it could be better reconfigured to suit the needs of capitalism. While the idea of a eugenic world continued to flourish in all capitalist countries, and culminated in the Nazi flesh experiment of the 1930s and early 1940s, the research never materialized that would be necessary to elevate the flesh machine to a developmental level on a par with the war machine.

Perhaps there is an even simpler explanation. Large-scale machinic development occurs at the pace of one machine at a time, since scarce resources allow for only so much indirect military research. After the war machine came to full fruition during World War I, along with the attendant economic expansion, it became possible to allocate a generous helping of excess capital for the expansion of the next machine. In this case, it was the sight machine that had proved its value during the

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war effort with the development of radar and sonar, and thereby jumped to the front of the line for maximum investment. It was also clearly understood at this point that global warfare required new attention to logistic organization. The road between strategic and tactical weapons and logistical needs had leveled out, and this realization also pushed the sight machine to the front of the funding line. Conversely, the need of the Allied powers to separate themselves ideologically as far as possible from Nazi ideology pushed the desired development of the flesh machine back into the realm of nonhuman intervention. Consequently, the alliance between the war machine and the sight

machine continued without interruption, delivering increasingly sophisticated weapons of mass destruction. This alliance also gave rise to an ever more enveloping visual/information apparatus - most notably satellite technology, television, video, computers, and the Net.

While the war machine reached relative completion in the 60s, the sight machine did not reach relative completion until the 80s (die-hard web-users might want to argue for the 90s). Now a third machine can claim its share of excess capital, so the funds are flowing in increasing abundance to a long-deferred dream. The flesh machine is here. It has been turned on, and, like its siblings the war machine and the sight machine, it cannot be turned off. As to be expected, elements of the sight and war machines are being replicated in the construction of the flesh machine. It is these moments of replication that are of interest in this essay.

A BRIEF NOTE ON SCIENTIFIC IMAGINATION, ETHICS, AND THE FLESH MACHINE

In the best of all possible worlds, ethical positions relevant to the flesh machine would be primary to any discussion about it. Indeed, to read the literature on the flesh machine (which at this point is dominated by the medical and scientific establishments), one would think that ethics is of key concern to those in the midst of flesh-machine development; however, nothing could be further from reality. The scientific establishment has long since demonstrated that when it comes to machinic development, ethics have no real place other than their ideological role as spectacle. Ethical discourse is not a point a of blockage in regard to machinic development. Take the case of nuclear weapons development. The ethical argument that species annihilation is an unacceptable direction for scientific inquiry should certainly have been enough to block the production of such weaponry; however, the needs of the war machine rendered this discourse silent. In fact, the need of the war machine to overcome competing machinic systems moved nuclear weapons development along at top velocity~ Handsome rewards and honors were paid to individuals and institutions participating in the nuclear initiative. In a word, ethical discourse was totally ignored. If big science can ignore nuclear holocaust and species annihilation, it seems safe to assume that concerns about eugenics or any of the

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other possible flesh catastrophes are not going to be very meaningful in its deliberations about flesh-machine policy and practice. Without question, it is in the interest of pancapitalism to rationalize the flesh, and it is in the financial interest of big science to see that this desire manifests itself in the world.

Another problem with machinic development could be the institutionally contained Panglossian reification of the scientific imagination. Consider the following quote from Eli Friedman, president of The International Society for Artificial Organs (ISAO), in regard to the development of artificial organs:

Each of us attempting to advance medical science-whether an engineer, chemist, theoretician, or physician -depends on personal enthusiasm to sustain our work. Optimistic, self-driven investigators succeed beyond the point where the pessimist, convinced that the project cannot be done, has given up. Commitment to the design, construction, and implanting of artificial internal organs requires a positive, romantic, and unrestrained view of what may be attainable. Members of our society share a bond gained by the belief that fantasy can be transformed into reality.

and:

ISAO convenes an extraordinary admixture of mavericks, "marchers to different drums," and very smart scientists capable of converting "what if" into "why not."

These lovely rhetorical flourishes primarily function to rally the troops in what ..will be a hard-fought battle for funding. It's time to move fast (the less reflection the better) if the AO model is to dominate the market; after all, there is serious competition from those who believe that harvesting organs from animals (transgenic animals if need be) is the better path along which to proceed. But it is the subtext of such thinking that is really of the greatest interest. From this perspective, science lives in a transcendental world beyond the social relationships of domination. If something is perceived as good in the lab, it will be good in the world, and the way a scientist imagines a concept or application to function in the world is the way it will in fact function. The most horrifying notion, however, is the idea (bred from a maniacal sense of entitlement) that "if you can imagine it, you may as well do it," as if science is unconnected to any social structures or dynamics other than utopia and progress.

Perhaps the only hope is that the funding and the optimism will become so excessive that they will undermine machinic development. The Strategic Defense Initiative, or "Star Wars," is a perfect example of incidental resistance from the scientific establishment. During the Reagan-era bonanza for war-machine funding, the most ludicrous of promises were made by big science in order to obtain research funds. The result was a series of contraptions that epitomize the comedy of science. Two of the finest examples are the rail gun that self-destructed upon launching its pellet projectile, and the deadly laser ray that had a range of only three

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feet. While the American taxpayers might see red over the excessive waste, a major section of the scientific establishment was apparently distracted enough by the blizzard of money that they failed to make any useful lethal devices.

IF I CAN SEE IT, IT'S ALREADY DEAD

The war machine and the sight machine intersect at two key points-in the visual targeting of enemy forces (military sites, production sites, and population centers), and in visualizing logistical routes. Once sited and accurately placed within a detailed spatial grid, the enemy may be dispatched at the attacker's leisure, using the most efficient routes and means of attack. As long as the enemy remains invisible, determining proper strategic action is difficult, if not impossible. Hence any successful offensive military action begins with visualization and representation. A strong defensive posture also requires proper visual intelligence. The better the vision, the more time available to configure a counterattack. The significant principle here-the one being replicated in the development of the flesh machine-is that vision equals control. Therefore the flesh machine, like its counterparts, is becoming increasingly photocentric.

Not surprisingly, much of the funding for the flesh machine is intended to develop maps of the body and to design imaging systems that will expedite this process (of which the Human Genome Project is the best-known example). From the macro to the micro no stone can remain unturned. Every aspect of the body must be open to the vision of medical and scientific authority~ Once the body is thoroughly mapped and its mechanistic splendor revealed, any body invader (organic or otherwise) can be eliminated, and the future of that body can be accurately predicted. While such developments sound like a boon to humanity, one need not be an expert in the field to be skeptical of their prospects.

While it is hard to doubt the success of the war machine in reducing military activity to the mechanized (that is, fully rationalized structures and dynamics), it is questionable whether the body can be reduced to a similar state regardless of how well it is represented. One major problem is that

the body cannot be separated from its environment, since so many of its processes are set in motion by environmental conditions. For example, a toxic environment can produce undesirable effects in the body. Visual representation alerts medicine to an invasion, so action can be taken to contain or eliminate the invader. In this situation, medicine is reactive rather than preventive, and treats only the effect and not the cause. In fact, it diverts causality away from ecological pathologies, and reinvests it back in the body. In this manner, medicine becomes an alibi for whatever created the toxic situation that infected the body in the first place, by acting as if the infectant emerged internally. The problem raised here is the limited frame of representation in regard to the body map, in conjunction with an

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emphasis on tactical solutions to physical pathologies. This situation is, of course, understandable, since strategic action would have an undermining effect on the medical market. The one exception to this rule is when the toxic body emerges due to behavioral factors. In this case, the scientific/medical establishment can expand its authority over the body by suggesting and often enforcing behavioral restrictions on patients. In this situation, the science and medical establishment functions as a benevolent police force deployed against individuals to better mold them to the needs of the state.

To complicate matters further, flesh-machine science and medicine have the unfortunate but necessary habit of putting the cart before the horse. The flesh machine, unlike its counterparts, does not have the luxury of developing its visual and weapons systems simultaneously, nor can weapons development precede advanced visual capabilities. The visual apparatus must come first. For example, antibiotics probably could not have been invented before the development of a microscope. Consequently, as in most research and development, a scattershot method is employed, whereby all varieties of vision machines are developed in the hopes that a few may be of some use. This leads to thrilling headlines like the following from Daniel Haney of the Associated Press: "Brain Imagery Exposes a Killer." What this headline refers to is a new medical map, acquired through the use of positron-emission tomography, which reveals the part of the brain affected by Alzheimer's disease, and the degree to which the brain has been eroded by the disease. This map can help physicians to diagnose Alzheimer's up to ten years before symptom onset. The comedy begins with the admission that there is no way to

predict when symptoms will begin to appear, and that there is still no known treatment for the disease. All that medical science can do is tell the patient that she or he has the disease, and that she or he will be feeling its effect sometime in the future. The excitement over being able to visualize this disease comes from the belief that if the disease can be seen, then cure is near at hand. Or, in the words of the war machine, "If I can see it, it's already dead."

Since the process of visualization and representation in this case is at best only an indication of a far-off possibility for cure, and hence is of little use for the patient already diagnosed with the disease, it must be asked: who could benefit from this information? Alzheimer's is in fact doubly problematic because it can be visualized before symptom onset, and because genetic mapping can also be used to indicate an individual's likelihood of developing it. The flesh machine's intersection with the surveying function of the sight machine becomes dramatically clear in this situation. Those who would benefit most from this information are insurance companies and the employer of the person likely to be afflicted with the ailment. Such information could be a tremendous cost-cutting device for both. However, ethical discussions about collecting bio-data lead one to believe that this kind of information would remain confidential in the doctor-patient relationship. Perhaps privacy will be maintained. However, it seems more likely that if the information is perceived to lead

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to significantly higher profits, resources will be allocated by corporate sources to acquire it. The most common strategy to watch for is legislative initiatives pursued under the spectacle of benevolence. Mandatory drug testing for some in private and public employment, under the authority of employee and public security, is an example of the means by which privacy can be eroded.

Finally there is the problem of representation itself. As the war machine demonstrates, the greater the visualization of a frontier territory, the greater the degree of contestation at the visualized sight. In other words, the more that is seen, the more power realizes what needs to be controlled and how to control it. The brain is certainly going to be the key target, but happily, at this point, the research is too immature to warrant strategic intervention by state power. There are, however, good indicators of how the coming battle will take shape. One needs only to think of the visualization of the body and its connection to varieties of smoking bans (from the legalistic to the normative), or, in terms of populist countersurveillance, of the relationship between toxins (DDT, for example) in the environment to body visualization to understand the connection between vision, discipline, and contestation. The prize-winner, however, is the visualization of uterine space. Feminist critics have long shown how this point of ultra-violent contestation is but the beginning of the age of flesh-machine violence. (This is also a point of great hope, as the discourse of the flesh machine has been appropriated from the experts. At the same time, this conflict has shown how fascist popular fronts are just as adept at appropriation). In regard to uterine space, feminist critics have consistently pointed out that this variety of representation loads the ideological dice by presenting the space as separate from the wholistic bio-system of the woman, thus reinforcing the notion of "fetal space." This idea acts as a basis for "fetal rights," which are then argued as taking precedence over the rights of women.

A new era of bio-marginality has surely begun. Certainly this situation will only be reinforced by the visualization of diseases or abnormalities (actual or potential) in subjects soon to be classified under the sign of the unfit. The unfit will be defined in accordance with their utility in relationship to the machine world of pancapitalism. The mapped body is the quantified body. Its use is measured down to the penny. Without such a development, how could any consumer have trust in the markets of the flesh machine~

SELLING FLESH

One of the oldest manifestations of the flesh machine is the idea of engineering the breeding of plants and livestock to produce what are perceived to be the most functional products within a given cultural situation. Increased knowledge about this task has certainly contributed to the great abundance in the food supply in the first world, thus shifting an individual's relationship to food from one of need to

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one of desire. In light of this achievement, industrial food producers have been faced with the task of developing foods that meet the logistical demands of broadbased distribution, while still maintaining a product that the manufacturer can market as desirable. The most productive solution thus far is the manufacture of processed foods; however, the market for food cannot be limited to processed food. The desire for perishable foods is too deeply etched into the culture, and no amount of spectacle can root out this desire. Fortunately for the producers of perishable foods, the product and the market can be rationalized to a great extent. This particular market is of interest because it provides at this moment the best illustration of the market imperatives that are being replicated in the industrial production and distribution of human flesh products. (This is not to say that flesh production will not one day be more akin to processed food; it is only to argue that at present the means of production are still too immature.)

To better illuminate this point, consider the case of apples. At the turn of the century, there were dozens of varieties of apples available to the buying public. Now, in many places, when a consumer cruises through a supermarket in search of apples, the choice has been limited to three (red, green, and yellow). Choice has become increasingly limited partly because of logistical considerations. Like most perishable fruits and vegetables these days, apples are bred to have a long shelf life. In order to have apples all year round, they must be transported from locations that have the conditions to produce them when other locations are unable to. Hence these apples must be able to survive an extended distribution process, and not all varieties of apples are capable of resisting rotting for long periods of time. However, logistics alone does not adequately explain choice limitations. Perhaps more important to the formula are market considerations.

Marketing agencies have understood for decades that desire is intensified most through visual appeal. How a product looks determines the probability of a consumer purchase more than any other variable. For apples, the consumer wants brightly colored surfaces, a rounded form, and white inner flesh. In other words, consumers want the perfect storybook apple that they have seen represented since they were children. Apples are bred to suit the cultural construction of "an apple," and only a few varieties of apples can simulate this appearance and meet this desire. This situation is yet another example of Baudrillard's universe of platonic madness, where consumers are caught in the tyranny of representation that passes as essence.

Along with the domination of vision, there comes the need of the producer to offer the consumer a reliable product. The apples one buys tomorrow have to look and taste like the ones bought today. Consequently, there is an elimination of sense data other than the visual. If all that is needed to excite desire is appearance, why bother to develop taste and smell? Especially when a good product can be guaranteed if it is completely tasteless (one can be sure that the apple purchased tomorrow will taste like the one purchased today). In this situation, the tyranny of the image becomes glaringly apparent; one would think that smell and taste

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would be the dominating senses when buying foods, since they would best articulate the pleasure of consumption. Not so. It is vision, and unfortunately many of the tastiest apples do not look very good, because they have none of the necessary storybook appeal. Consequently, various types of apples have been eliminated, or limited to distribution in localized markets.

If the principles of product reliability and visual appeal are applied to the production/consumption components (as opposed to those concerned with control) of the flesh machine, the reasons for some recent developments become a little clearer. The first problem that flesh producers must face is how to get a reliable product. At present too little is known about genetic processes to fulfill this market imperative. Consequently, they have had to rely on fooling the naive consumer. For example, one characteristic commonly sought after by those in the techno-baby market is intelligence. Unfortunately this characteristic cannot be guaranteed; in fact, flesh producers haven't the slightest idea how to replicate intelligence. However, they can promise breeding materials from intelligent donors. While using the sperm of a Nobel Prize winner in no way guarantees a smart child (it doesn't even increase the probability, nor does it decrease the probability of having an below-average child), flesh dealers are able to use false analogies to sell their products. If two tall parents have a child, the probability of the child being tall is increased, so, the argument goes, wouldn't it be correct to say that if two people of above average intelligence have a child that it would increase the probability that the child will have above average intelligence? Many consumers believe this line of thought (the myth of hard genetic determinism has always been very seductive) and are therefore willing to pay higher prices for the sperm of an intelligent man than they are for the sperm of an average donor. Although this fraud will probably not continue indefinitely in the future, an important ideological seed is being sown. People are being

taught to think eugenically. The perception is growing that in order to give a child every possible benefit in life, its conception should be engineered.

Another common strategy to better regulate flesh products is to take a genetic reading of the embryo while still in the petri dish. If a genetic characteristic is discovered that is deemed defective, the creature can be terminated before implantation. Again, parents-to-be can have their eugenic dreams come true within the limits of the genetic test. Even parents using the old-fashioned method of conception have the option of visualization (sonar) to make sure that the desired gender characteristic is realized. In each of these cases, better visualization and representation, along with an expanded range of genetic tests, will help to insure that desired characteristics are always a part of the flesh product, which leads to the conclusion that better vision machines are as important for profit as they are for control.

At the same time, remember that the marketing practices of postmodernity do not wholly apply to the flesh machine, and at present tend to function on an as

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needed basis. Fertility clinics, for example, participate as much in the economy of scarcity (although it must be noted that these products and processes do not intersect the economy of need) as they do in the economy of desire. While they may use the practices described above, they also have the luxury of being the only option for those who have been denied the ability to produce flesh materials. Those clinics that can boast a product success rate of over 20 percent (most notably the Center for Reproductive Medicines and Infertility at New York Hospital-Cornell Medical Center, with a success rate of 34 percent) cannot meet the demand for their goods and services. Apparently, the market for flesh goods and services has been preconstructed in the bio-ideology of capitalism.

WHEN WORLDS COLLIDE

Assuming that the flesh machine is guided by the pancapitalist imperatives of control and profit, what will occur if these two principles come into conflict with one another? This has been known to happen as social machines march toward maturity. The sight machine is currently facing this very contradiction in the development of the Net. Currently the Net has some space that is relatively open to the virtual public. In these free zones, one can get information on anything, from radical politics to the latest in commodity development. As to be expected, a lot of information floating about is resistant to the causes and imperatives of pancapitalism, and from the perspective of the state is badly in need of censorship. However, the enforcement of limited speech on the Net would require measures that would be devastating to on-line services and phone-service providers, and could seriously damage the market potential of this new tool. (The Net has an unbelievably high concentration of wealthy literate consumers. It's a market pool that corporate authority does not want to annoy.) The dominant choice at present is to let the disorder of the Net continue until the market mechanisms are fully in place, and the virtual public is socialized to their use; then more repressive measures may be considered. Social conservatism taking a back seat to fiscal conservatism seems fairly representative of pancapitalist coriffict resolution. The question is, will this policy replicate itself in the flesh machine?

A good example to evaluate with regard to this issue is the ever-elusive "gay gene," always on the verge of discovery, isolation, and visualization. Many actually anxiously await this discovery to prove once and for all that gayness is an essential quality and not just a "lifestyle" choice. However, once placed in the eugenic matrix this discovery might elicit some less positive associations. In the typical alarmist view, if the gene comes under the control of the flesh machine, then it will be

eliminated from the gene pool, thus giving compulsory heterosexuality a whole new meaning. Under the imperative of control this possibility seems likely; however, when the imperative of marketability is considered, a different scenario emerges.

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There may well be a sizable market population for whom the selection of a gay gene would be desirable. Why would a good capitalist turn his back on a population that represents so much profit, not to mention that gay individuals as a submarket (CAE is assuming that some heterosexuals would select the gay gene too) must submit to the flesh machine to reproduce? Again, market and social imperatives come into conflict, but it is unknown which imperative will be selected for enforcement.

The example of the "gay gene" at least demonstrates the complexity of the flesh machine, and how difficult the task of analyzing this third leviathan will be. What is certain is that the flesh machine is interdependent with and interrelated to the war machine and the sight machine of paricapitalism, and that it is certainly going to

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intensify the violence and the repression of its predecessors through the rationalization of the final component (i.e., the flesh) of the production/consumption process. Until maps are produced for the purpose of resistance and are cross-referenced through the perspectives of numerous contestational voices, there will be no way, practical or strategic, to resist this new attack on liberationist visions, discourse, and practice.

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end