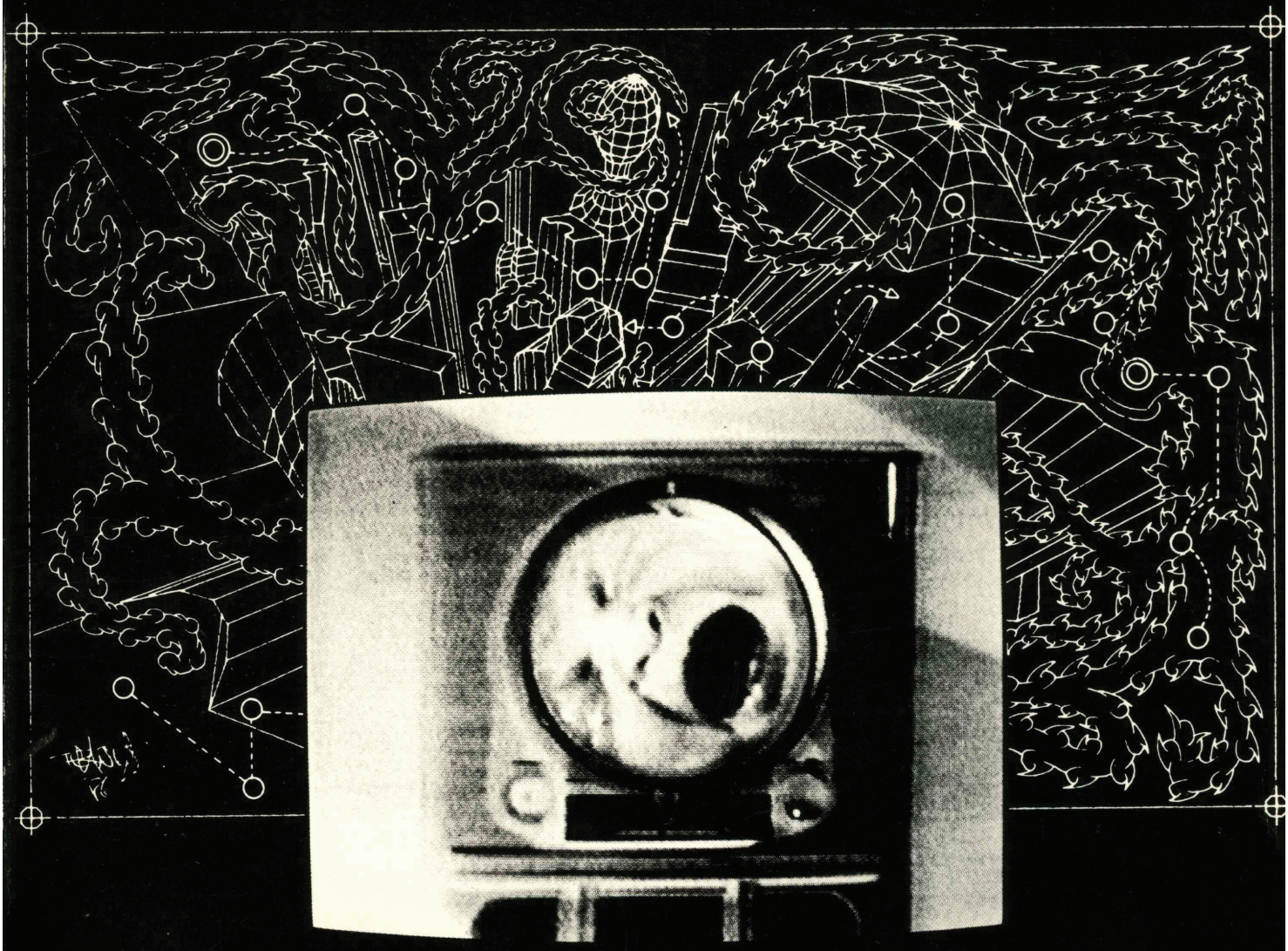
NEW TECHNOLOGY

Nos. 20/21 $8.00

millennium FILM JOURNAL



- *Photography & the Computer*
- *Interactive Video*
- *On-line Editing*
- *GEORGE KUCHAR*
- *MANUEL DE LANDA*
- *BILL VIOLA*

Camera Fantasla: Computed Visions of Virtual Realities

TIMOTHY BINKLEY

/. *Sticky Film*

Because it is mindless and dispassionate, the camera remembers better than mem-ory ¡tself. A picture not only proves where we were but enables us to return again at will to examine, with glimmerings of omniscience, myriad details missed ¡n the heat of the moment. Seeing is believing and using a camera has come to be an extensión of seeing.

As I peruse a photograph of the Colosseum in Rome, I see not only patches of pigment but also ruins of a once grand edifice, people perambulating like tourists, and the now ubiquitous automobiles clustered about. I can infer many things about the setting and the picture by examining it more carefully. Barricades have been erected near the Colosseum. What is their purpose? Are they still there now? When were they put up? By looking closer I might be able to answer some of these questions. It ¡s curious how cars offer one of the most perspicuous clues to when a photograph was taken. If I see several 1964 models, I know the picture was snapped since 1964 and can confirm and corrobórate additional facts about such things as the state of the ruin at the time and the styles of apparel then popular. Comparable conclusions are drawn from the moving pictures of cinema, where period styles abound and ¡nferences about how the world used to be supply the touchstone for a realist tradition ¡n film theory.'

In his engaging essay, *Camera Lucida,* Roland Barthes relates this droll encounter with an intransigent photograph:

> The Photograph's essence is to ratify what it represents. One day I received from a pho-tographer a picture of myself which I could not remember being taken, for all my efforts; I ¡nspected the tie, the sweater, to discover in what circumstances I had worn them; to no avail. And yet, *because it was a photograph* \ could not deny that I had been *there* (even if I did not know *where).*[2]

Barthes echoes the familiar notion that photographs are not prevaricators: they speak with resounding, if not unassailable, probity. Their truthful reputations grant them the power of conviction in courts of law. They are potent enough to precipítate chilling fear in the victims of a blackmailer who wields them as sinister weapons. Even a simple

snapshot can testify with the veracity of a legal document: "Every photograph is a certifícate of presence."[3]

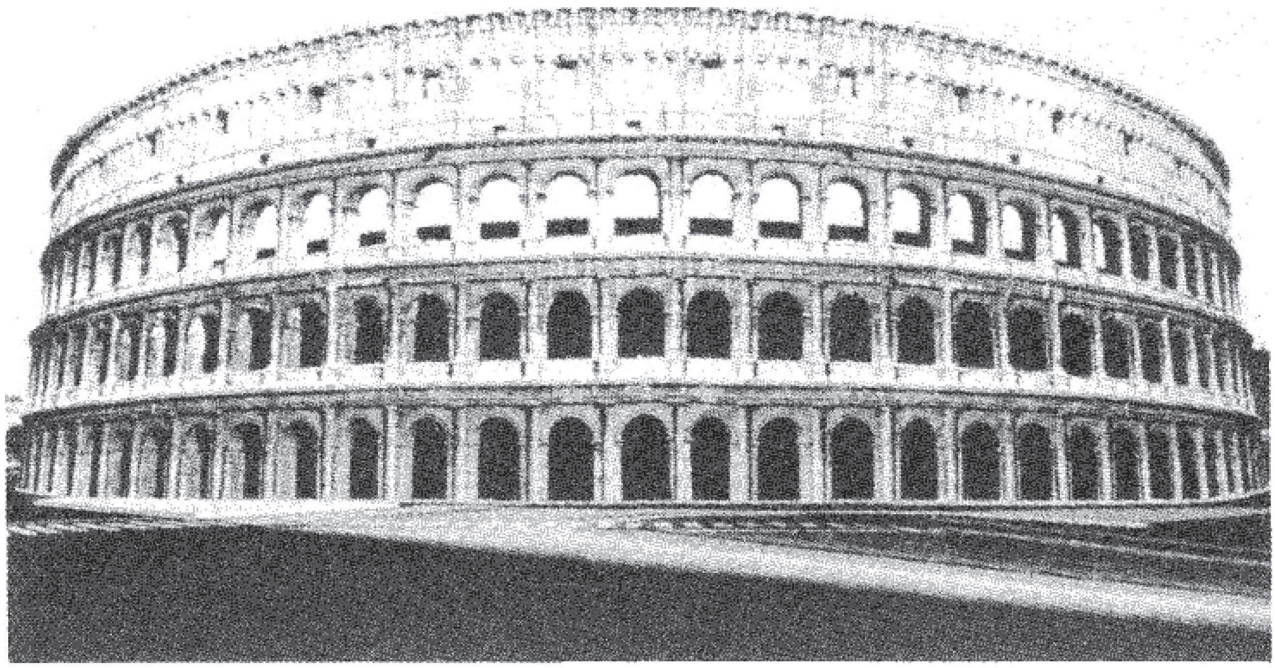
Wherein lies the forcé of this photographic witness capable of extracting Barthes' reluctant assent? It is often attributed to the direct though momentary intercourse between image and world which inextricably links the picture and ¡ts subject. The venerated history of this realist approach to photography goes back to a time soon after its invention when Alphonse de Lamartine assailed the médium as "a plagiarism of nature."[4] So intímate are the photograph and ¡ts subject that they are considered inseparable: "The Photograph belongs to that class of laminated objects whose two leaves cannot be separated without destroying them both. . . . In short, the referent adheres."[5] The viscid film ¡s prepared through a chemistry which primes it to capture tracks of passing light on a piece of gelatin or paper. Chemical changes ¡n the emulsión are caused directly by the light reflected from a scene at a particular moment ¡n time. As Susan Sontag puts ¡t, a photograph is "a trace, something directly stenciled off the real, like a footprint or a death mask."[6] Barthes describes the process as follows:

> The photograph is literally an emanation of the referent. From a real body, which was there, proceed radiations which ultimately touch me, who am here; the duration of the transmission is insignificant; the photograph of the missing being, as Sontag says, will touch me like the delayed rays of a star. A sort of umbilical cord links the body of a photographed thing to my gaze: light, though impalpable, is here a carnal médium, a skin I share with anyone who has been photographed.[7]

Barthes describes a circuit which begins with a subject ¡n the real world and returns to ¡t, passing through the observer along the way. According to his account, a photograph originales with an object which reflects light onto a photosensitive sur-face. The ¡nference back to the referent is made by tracing this path ¡n reverse, and the validity of this inference is based on the stickiness of the film, on the assumption that, once mated, the two are married. Barthes regards this connection as so inviolable that he hardly sees any need for ¡nference at all. However, the difficulty he had reconstructing the event when he wore that particular tie and sweater demonstrates that the photograph must be treated as evidence of a past reality, not an extensión of its actual presence. We must recréate the scene pictured by tracing the process back-ward, and despite Barthes' reassurances, that step can be a tenuous one. There is a chink ¡n the stolid armor of photographic truth leaving ¡t vulnerable to the corruptions of mischievous forces, which can insinúate themselves between the laminated layers.

//. *Supple Digits*

Every picture may tell *a* story, but the veracity of its tale ¡s no longer attested by its photographic míen. A new technology has been born which disinherents photography from ¡ts legacy of truth and severs its umbilical cord to the body of past reality. The age of prevaricating photographs ¡s rushing upon us. Sticky film gives way to supple information.



Reality Improved, BertMonroy, 1987. Digital photo retouching done on a Mac II using ImageStudio software.

Bert Monroy made a picture which pointedly trumpets the demise of photographic candor. *Reality Improved* is a picture of the Colosseum as it might appear if less abused by the ravages of time. Its regenerated purity is blessed with a timeless serenity realized by ¡solating it from the "clutter" of parked cars, barricades, and tourists—the kind of mundane stuff that bountifully populates the real world and betrays its mortality. The photograph was not merely doctored; it was transfigured by computerized image proc-essing. Yet, apart from its referen!, the look of Monroy's sham is indistinguisable from the direct emanation of reality onto film. Nothing is apparent to the naked eye, which cries out "fake." If the spurious elements could be detected at all, it would only be through a sophisticated structural analysis of visually hidden features, which is very different from scrutinizing the surface of a magnified print or negative, looking for seams. A seamless whole was created, which displays a ruin un-ruined, and no marks from the reconstruction appear on the print or negative since the process did not take place ¡n the realm of photography at all, but rather in a meta-visual world accessible only by computer. For good measure, Barthes might have been put into the picture as well to underscore how unwarranted his presumption of presence has become. Pho-tography's fall from grace brings with it increasing dangers in making inferences about reality on the basis of the content of pictures.

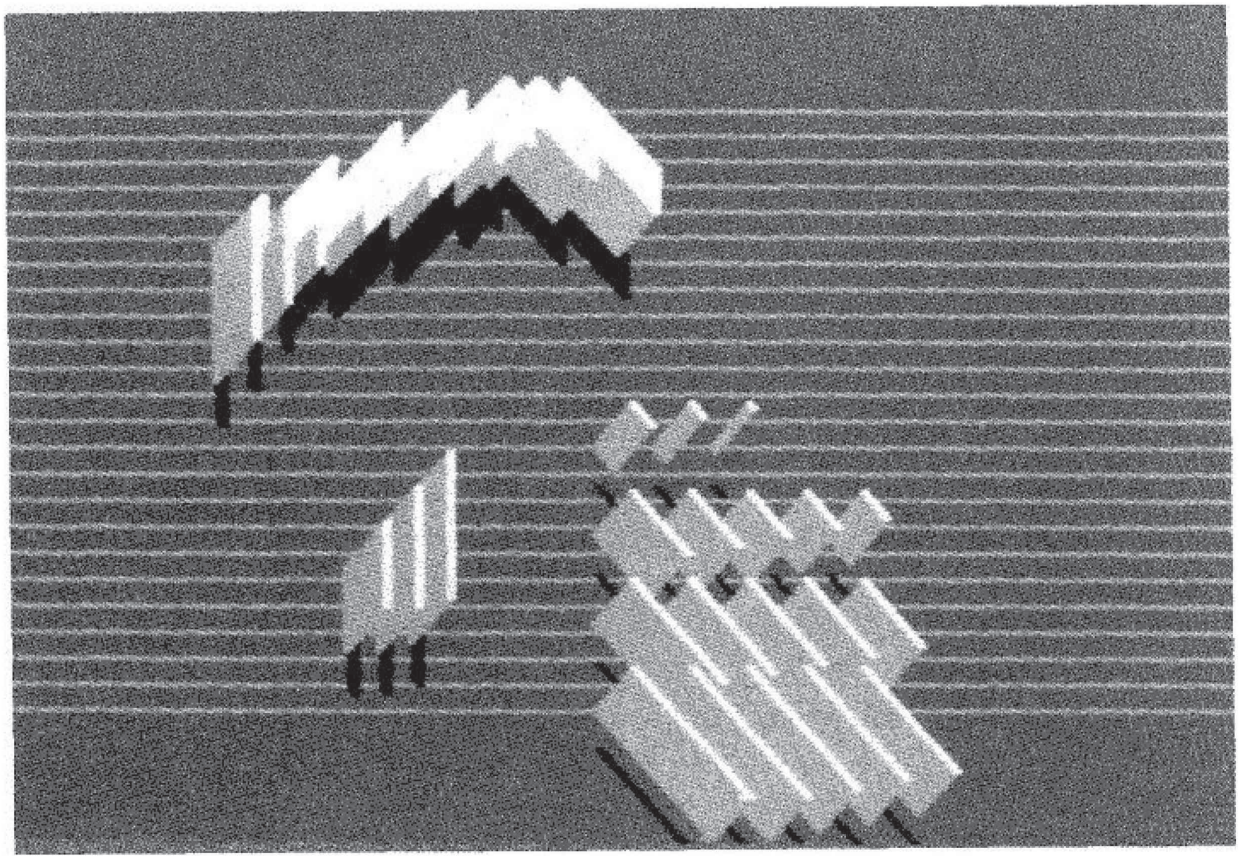
The muse of photography did not await the ¡nvention of computers before per-mitting provocative ruses. More than a century ago Osear G. Rejlander and Henry Peach Robinson effectively utilized a technique called "combination printing" to join images of disparate scenes ¡n a single photograph.[8] By carefully masking the paper, sepárate negatives were printed one at a time to construct a picture whose components

were photographed at different times and places. Many more trick photography tech-niques have been invented since then with an unusual resourcefulness marshalled to satisfy the hunger for cinematic special effects. But this traditional chicanery differs profoundly from the image processing used by Monroy, which shares its dominión of meta-visual secrets with a growing league of computer-assisted pictures showing up in galleries, magazines, cinema, and televisión.

A photograph retains pictorial information in its smooth layer of light-sensitive film which quickly responds to any illumination by undergoing chemical changes that record an image. This is an *analog* information formal implanted in a physical sub-stance. A computer stores meta-pictorial information in a fragmented array of discrete numbers, which cannot communicate directly with the depicted or the observing world: some kind of translation is required before this set of abstruse digits can record or represent anything visual. In this *digital* formal, defined not by a physical médium but by a conceptual struclure, pictorial space is approached analylically, fragmented into regular rows and columns of small dols called *pixels* (picture elements). The concrete physical grains of chemicals in a photograph are replaced by an intangible array of numbers. The color of each dol is represented by a number, which is systematically, though more or less arbitrarily, correlaled wilh Ihe specific color it stands for. These numbers are stored in a special parí of the computer's memory called ¡Is image memory or *frame buffer,* and gelting the numbers from a buffer onto a picture plañe then requires an *interface,* which Iransforms numbers into colors. The Iranslation from concept to object could be as simple a process as reading a list of numbers and making corre-sponding dots on paper with crayons; but the procedure is usually automaled with special interface hardware, which converts numbers into an analog formal suitable to a parlicular médium: paper, film, video, textiles, etc. A similar, though reverse, process is sometimes used to interpret colors in the world as numbers.

To accomplish his subterfuge, Monroy firsl *digitized the* original photograph of the ruin. He converted the continuous tones and shades of grey into a set of discrete numbers individually manipulable. Thus, his relouching diverges immedialely and widely from Ihe course laken by Ihe maslers of 19lh Cenlury combinalion prinling. He casts the picture into an invisible bin of digits where it ís subjected to the prods and pricks of mysterious analytical tools ihal can break the image into minutae, subject ihese to sophisticated modifications, and then reconstitute them into a seamless new picture. The end product is a photograph, but it visually "depicts" the numerical contents of a frame buffer, and not necessarily the state of any real place at any particular time.

Larry Cuba uses the computer not to process existing images but to créate new



Still from *Calculated Movements,* Larry Cuba, 1985.

ones. Although his animated films use austere shapes, their multiplicity and complex movements make it impossible for him to realize his visions using manual techniques:

> . . . my tool ¡s the mathematics and the programming that depend on a computer as the médium to execute it. So ¡n that sense the computer adds a new dimensión to this field of exploration which started with Gina and Corra, the Italian Futurists who are attributed with the earliest abstract films in 1912. They were talking 20th Century dynamism. Today we're talking mathematics.[9]

To make or change computer images is to assign valúes to numbers. This makes them manipulable in non-physical ways, giving rise to greater flexibility and a wider variety of tools than traditional media allow. Pictures can, for example, be entirely calculated instead of drawn or photographed. Integrated combinations of formal and manual methods are also possible since all ¡nputs to the image memory are reduced to a common numerical denominator. Although it can be photographed and printed, the image itself ¡s a phantom somehow instilled in the collection of numbers in the buffer. Since each dot can be altered individually, greater control can be exerted over minute portions of the picture.

Such image-making is not only carried out with mathematical precisión, ¡t is also governed by mathematical concepts, which provide new expressive possibilities. Con-

trary to some preconceived prejudices, the formality of this new creative resource does noteviscerate ¡tsartistic expression. Gene Youngblood has said ofCuba's films, "Words like elegant, graceful, exhilarating or spectacular do not begin to articúlate the evoc-ative power of these sublime works characterized by cascading designs, startling shifts of perspective and the ineffable beauty of precise, mathematical structure.'"" If images are numbers, then shapes and movements can be created by manipulating numbers; and the tools for doing this are mathematically based without being artistically vapid. Computer art is realized in a virtual world of logic, formulae, and numeráis where qualities revolve about quantities as epiphenomena of a mensurative geometry of creation. Some artists, like Larry Cuba, enter the meta-visual world directly by pro-gramming mathematical formulae; others, like Bert Monroy, use software programs written by others that simúlate traditional artistic tools (such as charcoal, pens, and brushes) to provide access to a pre-defined stock of techniques. Although a computer artist may design for output to a particular médium, the creative activity does not occur ¡n that médium, but rather ¡n the frame buffer or perhaps somewhere else in the computer's random access memory (RAM). One can produce impressive photographs from a computer, but the information worked over mathematically could just as easily be output to video or ink without changing its numerical properties. The meta-visual substance molded by a computer artist has the paradoxical properties of being at the same time readily manipulable and eminently malleable while remaining nevertheless stubbornly intangible. Like mathematics itself, the unique tools employed are at the same time imaginary and real, what Baudrillard calis "hyperreal.""