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Painting perceptions

Jacqueline Domin

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ROCHESTER INSTITUTE OF TECHNOLOGY

A Thesis Submitted to the Faculty of
The College of Fine and Applied Arts
in Candidacy for the Degree of

MASTER OF FINE ARTS

PAINTING PERCEPTIONS

By

Jacqueline Domin

May, 1990
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Forward

The computer is a multidisciplinary tool engaging all the senses. Creating with color, light, and motion is a rich visual experience enhanced by the vibrations of sound. These vibrations, both light and sound, are absorbed by the viewer and influence his experience. This makes the computer a profoundly different medium than the static arts. Artist have powerful tools with which to create experiences - paint perceptions.

As a painter, creating rich visual relationships has been a focus for many years. Exploring the computer as an image making tool is different than using it for graphic design. It has taken years to get time and access to equipment to pursue my thesis: image creation and processing, exploring painting and still video photography in an electronic format.

My first thoughts were how to get these images off the screen and into a hardcopy format. It soon became apparent to me that its better to leave them there in their natural habitat. Computer images seem to belong to a world of their own, fragile, dependent upon technology transient in nature, a reflection of the culture from which they emerged.

After six months of researching, planning, and creating a vision of what I wanted to do, I began, first by writing about the many connections I was seeing in every facet of life, clarifying the purpose and philosophy upon which my work is based. This gave me a solid platform from which to proceed.

It was my intent to create a series of animated paintings in an electronic gallery and then transfer the final production to video tape adding a sound track.
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Part One

Philosophical Background
Behind every thought and action is a basic philosophy which tries to explain life and the universe. With our thoughts we paint the perceptions that form our world.
A Global Perspective

We live in a turbulent time of change and question. Our progress as a culture has been a rational, intellectual affair. This one sided evolution has caused an imbalance. This imbalance is reflected in the mass media; high inflation and unemployment, the energy crisis, a crisis in health care, pollution and other environmental disasters, a rising rate of violence and crime, and so on. These are all facets of the same problem as Fritjof Capra writes in his book *The Turning Point*, this is essentially a crisis in perception.1 It arises from the fact that we are trying to apply the concepts of an outdated world view - (the mechanistic world view based on Cartesian, Newtonian science) to a reality that can no longer be understood in terms of these concepts. Classical physics and its reductionist, deterministic view that a whole may be broken down into independent parts and studied and understood separately, no longer can apply.

Today we live in a global interconnected world, in which biological, psychological, social and environmental phenomena are all interdependent. If we do not recognize this then we are living in an unhealthy and dangerous state of denial. We need a more ecological perspective which the Cartesian world view does not offer, a new vision of reality - fundamental changes in our thoughts, perceptions, and values.2 A shift from the mechanistic to the holistic conception of reality, a shift that can bring about world peace, cooperation and improved conditions to all mankind.

Self awareness can no longer be considered an esoteric luxury for a few educated individuals. It has become a social necessity. We are only beginning to understand the possibilities inherent in mastering the mind, but the challenges of our time call for accelerated learning. Humanity is gaining access to vast reservoirs of undeveloped potential, but unless egoic excesses are curbed by discriminating wisdom we run the risk of destroying ourselves. Perhaps the dilemma is a choice between ego transcendence and biological planetary death. The fact that collective suicide has become a real possibility vividly reflects the struggle between life and death... which is reenacted by the soul on any path. No one is exempt from participation in this human dilemma.3
Through modern physics, the study of the unseen world reinforces all of life’s interconnectedness. With the advent of systems theory (a holistic interdependence and relatedness of all phenomena) comes a framework, an integrated whole, whose properties cannot be reduced to those of its parts. These concepts can provide the scientific background to the changes in attitude and values that our society so urgently needs. Because our culture is dominated by rational, sensate, logical, linear thought it is much easier to convince our social institutions that the fundamental changes are necessary if we can give our argument a scientific basis. We must modify or even abandon some of our concepts when we expand the realm of our experience, like when you were a kid - giving up your favorite clothes when you grew out of them. It takes time to break the new ones in, to feel comfortable with the room for growth they provide.

These new concepts in science, mainly quantum theory and relativity theory, break new ground and social changes will soon follow. The sixties and seventies brought many changes in this new vision but the first stirrings of it can be found in religion. Buddhism and early Chinese thought addressed the paradoxes of the human condition. The IChing, the idea of continuous cyclical fluctuation between two archetypal poles, yin and yang, the underlying fundamental rhythm of the universe. It is perhaps difficult for us Westerners to understand that these opposites do not belong to different categories but are extreme poles of a single whole: organic unity. Nothing is only yin or yang; all natural phenomena are manifestations of a continuous oscillation between the two poles, all transitions taking place gradually and in unbroken progression. Therefore the natural order is one of dynamic balance between the two poles. In the Chinese view then there seems to be two kinds of activity - activity in harmony with nature and activity against the natural flow.

The two kinds of activity are closely related to two kinds of knowledge or modes of consciousness recognized as characteristic properties of the human mind throughout time, the intuitive and the rational. The first is related to the mystic or spiritual and the second to science. These two complementary modes of functioning must be balanced to insure the progress of an ever advancing civilization.
For too long now the left hemisphere of our brain, the rational, fragmented, linear, analytic side has dominated our culture. Evidence of this defective world order is all around us. Intuitive knowledge, a right hemisphere function, a direct nonintellectual experience of reality arising in an expanded state of awareness, tends to be holistic and nonlinear.7

Current brain research has found that when both the right and left sides of the brain work back and forth on a particular concern synergy is created. Synergy is the act of two things working together to increase each other's effectiveness. The progression of flow between opposite poles, parts of the same whole, each is needed to maintain a dynamic balance, a natural order.

In the mid 1800's the first stirrings of this new paradigm were given a social structure. This world embracing vision made itself apparent in the Baha'i Revelation in Persia. The Baha'i Faith is the youngest of the world's independent religions. Its founder Baha'u'llah (1817-1892) is regarded as the most recent in the line of Messengers of God that stretches back beyond recorded time and that includes Abraham, Moses, Buddha, Zoroaster, Christ and Mohammad. The central theme of Baha'u'llah's message is that humanity is one single race and that the day has come for its unification in one global society.8

O Children of Men!
Know ye not why We created you all from the same dust? That no one should exalt himself over the other. Ponder at all times in your hearts how ye were created. Since We have created you all from one same substance it is incumbent on you to be even as one soul, to walk with the same feet, eat with the same mouth and dwell in the same land, that from your inmost being, by your deeds and actions, the signs of oneness and the essence of detachment may be manifest. Such is my counsel to you, O Concourse of Light! Heed ye this counsel that ye may obtain the fruit of holiness from the tree of wondrous glory.9
Baha'u'llah wrote that all the peoples of the world must unite in the realization that they all belong to One Creator and to one household. He taught that there is one God whose successive revelations of His will to humanity have been the chief civilizing force in history. The agents of this process have been the Divine Messengers known to mankind as the founders of separate religious systems. Their common purpose has been to bring the human race to spiritual and moral maturity. Humanity is coming of age. It is this that makes it possible to unify the human family and build a peaceful, global society. Unity is a necessary prerequisite.

The following principles of the Baha'i Faith are vital to the achievement of this goal:

* establishment of universal peace upheld by a world federal system.
* abandonment of all forms of prejudice.
* assurance to women of equal opportunity with men.
* elimination of extreme poverty and wealth.
* recognition that true religion is in harmony with reason and the pursuit of scientific knowledge.
* the realization of universal education.
* the responsibility of each person to independently search for truth.
* recognition of the unity and relativity of religious truth.

When we as a race, the human race, finally realize how defective the present world order is we will be open as never before to structures which promote a new vision of reality, a new world order. Eventually by the realization of our own mortality we are impelled to search for transcendence in religion, in art, and in our relationship to the world. We are attracted to what connects us to the whole and to the future.

Structures for world peace upheld by a federalist world government will seek to eliminate prejudice and promote equality of each human being, just as each cell of the body is cared for. Each human being is like a piece in the grand puzzle of humanity. If you back up far enough you can see the whole of humanity.10 Men
and women must be recognized as two wings of a bird in harmonious interdependence of equalness. People will need to learn new modes for communicating - an auxiliary language for all people which allows for interaction and communication yet recognizing the importance of promoting unity while maintaining diversity of each culture. Mankind must accept that there is an essential harmony between science and religion (rational left and intuitive right), that these two modes of thinking must come into balance to achieve wholeness and health of our world. We must recognize that each child has the right to have their basic human needs met, but more than that, they has a right to an education and how important that is to the society as a whole.

In the past we have sought answers to our dilemmas through methods of the old world order. They have failed to provide adequate solutions. Each of us in every field has a responsibility to help keep the balance, to bring about a new awareness and help the world heal itself. We are at a turning point.

What ever you do may seem insignificant, but it is very important that you do it.\textsuperscript{11}

Mahatma Gandhi
The Artist as a Communicator

Communication of this new world view, this new world order, is of primary importance. Of all the tools presently available to us, the computer holds the most potential to connect us in one common body of humanity. It can provide an integrated mechanism for global communication. People have already begun from a grass roots level to communicate through networks or 'on-line communities' like Meta network which connects people in the United States. It provides members with continual reports on the latest developments in leadership and management theory, and knowledgable assessments of breakthroughs in computer communication technology.

Computers make available for the first time structures that can contain and encourage the development of divergent nonlinear thinking. They liberate human energy from some menial tasks. Scientists can now communicate with their colleagues in any part of the world. We can even send a satellite into space and receive data about the corners of our solar system with the aid of computers. Children with learning disabilities or physical disabilities can now participate in a world of learning previously closed to them.

Fax machines, teleconferencing and telepresence shrink the world. Children can visit their local museums in the United States and take part in live telepresence of a robot sub on the bottom of the Mediterranean Sea exploring an ancient shipwreck. Computers with interactive exploring programs are becoming as common in museums as the computer in the grocery store that helps you locate light bulbs, or rings up your order through the bar code, or the automatic teller machine machines that give you access, world wide, to your funds. Computers are bringing our world closer to us in a sense, and we are perhaps beginning to see that we are not really so different from each other on a deeper level.

As science and technology progress they must be balanced by a spiritual consciousness, by an awareness of the dance of eternal connectedness. If we don't achieve this then the outlook for our children will be bleak. Presently the world is unbalanced, the balance of science and religion must be given attention. In thought the rational (scientific) and intuitive (spiritual) are poles of the same whole. Balance is needed for healthy progress as a planet.
Wholeness must be communicated. The role of artists in this age could have dynamic implications. They have the chance to communicate this wholeness, to paint perceptions. Even the act of perceiving alludes to wholeness. Can there be object without viewer? The two create a unit; one cannot be understood without the other.
The Computer as a Tool

The computer can reflect the process of our mind instantaneously before us, a stark look at our own organization. Sherry Turkle, a Harvard psychologist, looks closely at the mind and spirit and how we relate to computers. She makes a distinction between tools and machines." Tools are extensions of their users; machines impose their own rhythm, their rules, on the people who work with them, to the point where it is no longer clear who or what is being used. We work to the rhythms of machines - physical machines or the bureaucratic machinery of corporate structure, "the system". We work at rhythms that we do not experience as our own. **12**

For the artist this is an important realization. We must keep in mind that these computers are tools for us to use and not machines that run us. Questions often arise with those just beginning in the field such as: Do the choices I make come from me solely? And how much influence do they have on the creative process? How much does the computer's part in the synergistic process influence the final outcome?

There is a primary concern over the question of consciousness. When lost in the creative process am I conscious of what I am doing? What do "I" want to accomplish? What vision do "I" want to create? What choices am "I" making? What is "my" philosophy? What if the "I" gets lost? Or am "I" acting as a hollow reed through which the divine creative energy flows?

Some search for a link between who they are and what they have made, between who they are and what they might create, between who they are and what, through intimacy with their own creations they might become. **13** Some are constantly trying to heal the split, to bridge the gap between the "I and Thou", the divine creative energy.

Images speak to man's intuitive side and can radically shape one's perception of the world. Artists can take the opportunity to use the computer, an interdisciplinary studio, capable of images, sound and movement, networking and interactive media to begin in the creation of this new vision we all intuitively know must come about.

The computer is viewed by some as cold, linear and rational, which runs counter to the intuitive nature of the artist. Yet artists
who use science and technology, i.e. the computer, feel a sense of complementarity. They are giving birth to a new mode of artistic expression, computer art; one that the art world itself does not yet want to deal with in more than a token avant-garde sense. A computer after all is a box of wires and lights. Work is only given form from human machine interaction. Philosophical questions once again arise. What is art?

The art world presently is having a difficult time accepting computer art as a valid art form. It is definitely well out of the comfort zone for Vivian Raynor, art critic of the New York Times, Bob Reilly of the San Francisco Museum of Modern Art, and Harry Rand of the National Museum of Art. All were participants in a panel discussion entitled, "Computer Art: The Oxymoron?" at the 1989 Siggraph Convention. Phillip Pearlstein who was also a member of the panel spoke more favorably about it as he showed slides of his experimentation of painting with paint systems.

Just as photography struggled to be recognized as an art form, computer art must go through its own struggle. Forms and avenues of human expression will continue to change just as mankind progresses spiritually and technologically. Direct biological image interfaces (yet undeveloped) might someday even transmit images directly into the viewers' mind. The expression "art" therefore will always be in transition. As a culture we are expanding our limits of thought. Art is thought that finds form. As our thoughts transform so will our art. Kandinsky talks about art that imitates the art of the past and likens it to a stillborn child. We need to ask, what makes us so afraid to move ahead?

We must expand our consciousness and get a broader picture of how we as people interact with these machines and with each other. We live in a culture that psychologists refer to as narcissistic. We are very much absorbed with ourselves and our immediate family.

"We are at a state where we are insecure in our understanding of ourselves, and this insecurity breeds a new preoccupation of who we are. We search for ways to see ourselves and our world. The computer is a mirror, a tool that allows us to witness ourselves and interconnect to the world. Beyond its nature as an analytical engine it has a second nature a reflective philosophical provocateur."
In our culture we are coming to interact with the computer in ways that allow us to become intimate with its second nature. As this happens, the connections and relationships between people through machines offers us the long awaited tools to connect the planet; the possibilities of intercultural, interpersonal exchanges. Idea banks, connections with ourselves and connections with others working throughout the world on scientific, cultural, or any area will become possible. Education networks, learning centers, communication systems, and interactive television, can bring to us a depth of knowledge and interactions with others who share our interests and concerns around the world.

Our culture, for the first time in history, has been given a chance to realize its wholeness. We are terrified of being alone, yet afraid of intimacy. We experience widespread feelings of emptiness, of disconnection, of the unreality of self. The computer, a companion without emotional demands, offers a compromise. You can be a loner but never alone. You can interact but never feel vulnerable to another person.\[16\] We must not allow ourselves to escape, we must take the initiative and the opportunity to connect with each other. The computer can be a connector within our comfort zone. There is a sense of merging with a universal system that appeals to one's sense of wholeness and order. All our ideas about self and ego may be challenged and reformed. The computer as a communication tool could make it possible for humanity to realize its unity.

Perhaps we will begin to catch glimpses of ourselves from a new perspective. No longer will we be the center of the universe but a particle of dust in the vastness of space and time, a single cell in the body of humanity. We are capable of promoting unity and oneness to the whole system of life on the planet, or we can be ambivalent.

" Every decision chooses the future. You are free to choose the qualities that you want to express in the world, just as you are free to choose beliefs and attitudes that you accept into your mind. If you do not choose consciously the choice is made unconsciously, or it is made for you by someone else. You can reclaim your capacity for choice at any time. " \[17\]
Unity Among Disciplines

Artists are communicators of visions as are scientists, both generating products of their minds. Einstein's Theory of Relativity is no less a work of art than Picasso's Guernica. These visions create new patterns around which human life itself is organized. Art in this sense is not so different from science. In physics for example there are two kinds of scientists, research and theoretical scientists. One analyzes and the other synthesizes. One takes apart and one puts together. A research scientist dissembles, categorizes and catalogs. A theoretical scientist conducts no experiments. He sees a chaotic variety in scattered parts and puts them together to form a single whole. He creates a theory and tests it through mathematics. They are works of art in and of themselves, pure human creative spirit at work. "The minds of great scientists have been governed by the artist's synthesizing vision."

Mathematicians, especially in the field of generative mathematics are finding they can create aesthetically pleasing images through algebraic equations. Ken and Bonni Evans of Manotick, Ontario, produce images made by manipulating equations founded on a similar principle as fractals, yet unlike fractal in that these images have a greater variety of self replicating spiral tentacles. A single mathematical formula is iterated - the output of the first equation is then reentered as the input to form a new variable for the original equation. Fractals themselves producing interesting images. Yet there is a reluctance to call these aesthetically pleasing images art. It depends on the viewer's perspective. Perhaps art is a window which allows us to see what otherwise we would not see?

In the purest sense of the word, what is art and what isn't is not an issue I have spent time debating. Its my belief that the process of creating for us as human beings is the process of reflecting the creative spirit from a source greater than ourselves. It flows into many media, connecting the fields of philosophy, religion, the sciences, mathematics, art, literature, etc., to each other in the dance of eternal connectedness. Those who cannot recognize the interconnectedness of all things will want to separate, categorize and protect his view of the world. Those who can recognize have no need to - there is a quiet awareness of something greater.
"Works of art and works of science teach us to see. They are the wings that lift us above the chaos of the here and now to a higher standpoint. Whatever is worthwhile in life depends on what they enable us to see, which we would not see otherwise. So all art invests our experience of actuality with meaning that it would not otherwise have. It creates meaning. This meaning over the whole range of art and actuality shapes our individual and collective lives, determines our behavior, provides design for the ever developing civilization by which mind has lifted life above the level of the beasts to such levels of awareness as we associate with divinity."19

Just as artists had to rethink their role in the world with the advent of photography, so too, now they must rethink their role as image makers. If aesthetically pleasing images can be generated by scientific visualization of data or mathematical formulas, machines, artificial intelligence etc. then the artist will be left to focus more on the purpose of his work. Work without purpose may be aesthetically pleasing but is it art? Maybe what is left for the artist is complete ego transcendence - to be a mirror with which to reflect the spirit which animates all.

Artists today have opportunities never realized up until this time in history. Not only do the have they chance to lead mankind into a new vision of interconnectedness but they have the tools to do it.
Part Two

Thesis Project "Oneness Heart"
The Concept of an Electronic Gallery

Painting by traditional means and in the electronic realm have been the focus for the past six years. Comparing the two processes is like comparing my two children. Each one has unique qualities yet one hesitates to compare children.

Images painted on canvas live in one level of consciousness and images created electronically live in another, like waking and dreaming. Paintings on canvas can be lived within waking physical consciousness and electronic paintings disappear into the seeming nether world when one shuts off the system containing them. The only evidence of them is on magnetic tape, electrical impulses, like brain waves of the REM dream state, unable to to be fully accurately recalled in waking state.

Artists using the computer to create and process images first wrestle with the dilemma of moving the images out of the electronic mode into a tangible form. There are several types of video printers for output such as the ektatherm still video printer, inkjet printers, and thermal printers, but none seem to produce an image that captures the spirit of the medium. Even photographically the images seem to lose their life force once removed from the screen. On the screen it is unlimited, luminous, living and capable of change. Off the screen it is a frozen moment, evidence of its past life.

I have been working on the concept of an electronic gallery as a format to present my images. The format of an electronic gallery is the computer where electronic images are displayed in a series, in the exact medium they were created. Making peace with the realm in which these images exist without a need for any hardcopy evidence has been part of a parallel internal growth process for me. Creating electronic paintings, living dynamic forms that create and dissipate before the viewer's eyes, is what my thesis work is about.
I began with writing a script after I articulated a philosophy upon which it is based. I was able to spend an entire summer reading, researching writing and planning the production called "Oneness Heart". Its purpose was to bring about an awareness of the unity of mankind. During the months I worked on the actual production, the world went through some amazing changes. The Berlin wall came down. Eastern Europe and the Soviet Union saw changes that brought about multi-party systems. Nelson Mandela was freed and plans to end apartheid in South Africa were discussed. Indeed, the world is moving ahead, an ever advancing civilization, taking its first steps toward unity. "Oneness Heart" is about this unity, a created vision, a painted perception.

Work began on the script first, writing, rewriting, distilling what I wanted to say into short utterances which I planned to show between the image sequence files. The production seemed to arise more out of a statement of purpose than out of design. Form followed function.

The process of story boarding began with a deck of screen sized cards upon which image sequences were planned. The images were produced in a number of ways: straight electronic still video images, retouched and processed still video images, scanned and painted images and images created solely with paint programs.

The software used was Studio 8, Photomac, Modern Artist, and Image Studio. I went about the project without a clear solution of how I would assemble these image files into a final presentation. A single electronic painting was created by a sequence of image files shown in succession.

The still video images were shot with a Canon 701 SV camera which recorded the images on a two inch floppy disk. This floppy disk was then read by a transciever unit which interfaced with a Macintosh computer. The computer, fit with a special Colorspace board, allowed the image to be captured (frame grabbed) and saved. The compression program Stuffit was used to compress the images and store them for future use.

My initial research revealed several problems. Each still video file took up several megabytes of memory and had its own color
look up table. This made compiling them a challenge. It soon became obvious that I needed to switch the file format I was using to save the images because compressing and decompressing them to work on was a tiresome process not to mention the large amount of space they took up. I switched from TIFF format to PICT format which used much less space and allowed two images to be recorded on the same 800K floppy. The average image size was 350K.

I spent many weeks shooting images both in a black studio with models and in natural light settings, then importing and saving them in the Macintosh environment.

I started to experiment with ways to assemble the electronic gallery. The first method I used was Macromind Director. This didn't pan out because to accelerate the files to dump to video tape required the use of only one palette, the system palette. My image files had very diverse color palettes.

Next I explored Supercard as a format but found similar problems with the color look up tables. When the image files (cards) displayed, the color palette of the second image arrived prematurely, causing an unwanted uncontrollable change in color to the first image. Even when blank cards were placed between the images the smooth motion was not there. By this point in the process I was feeling a little discouraged. I knew what I needed yet hadn't come across it.

As a last resort I arranged to get time on an optical disk recorder in the film and video department, which would allow me to record my images on optical disk one frame at a time. This seemed like a time consuming and awesome process but it looked like the only route left to pursue.

I was not entirely happy with the proposed solution but I stopped feeling so desperate. As soon as I let go of the struggle the solution presented itself. A consultant I talked to suggested I take a look at a program called "Gallery" which is part of the Studio 8 software. It allowed me to assemble my production into something that looked very much like a multi-image program.

Ideally I wanted to create an entire experience - images, sound and text into a twenty six minute piece that would run uninterrupted
and loop, all on the Macintosh, so it could be set up in a gallery setting and left unattended. It sounded impossible at times, but I was able to accomplish everything except computer-based sound. (System limitations made additional direct computer-based sound impossible for now).

Sound was a pretty important part of the experience I was trying to create so I transferred the piece to video tape and added a sound track. The entire program ran 26:46 minutes and took up 28,259K of memory. The decision to transfer it to video was a very practical one because of the large amount of memory required to load and run the program.

The process of transferring the show to video tape was accomplished by installing a Mass Microsystems ColorSpace II board (borrowed from the film and video department) in the Macintosh. The Colorspace II board allows a high quality interface between the computer graphics RGB world of the Mac II and the NTSC (National Television System Committee) video standard. The incoming NTSC signal is first decoded into RGB color space, then mixed with the Macintosh RGB graphics, and finally re-encoded back to the NTSC standard signal.

A 3/4" U-matic video tape recorder was hooked up to the computer. A composite video signal (video out) was taken out of the Mac II and sent via cable to the video in slot on the 3/4" video recorder. I wanted to create a standard VHS tape at the same time so I chained a VHS recorder to the 3/4" video recorder. A cable connected the video out slot on the 3/4" deck to a video in slot on the VHS recorder. To see the process and run the menu of the Color Space software, another monitor needed to be connected to the video out slot of the VHS recorder.

The results were good on the 3/4" tape and marginal on the VHS tape. The type started to lose considerable quality and definition on the VHS. I was dissappointed by the quality of a direct VHS master. I then made a copy from the 3/4" master on to VHS, the results were surprisingly much better than the VHS master.

The frustrating part of transferring any high resolution computer image to video is a noticeable loss in resolution, luminence and color saturation. From experience I knew what to compensate for in terms of line weight, color saturation, and bleeding when designing
for the eventual video output. The advantages of having video tape copy of the work outweighed the losses.

Several highlights happened during the process of creating this body of work. I got a chance to Beta Test "Color Studio" by Letraset through the Electronic Photography Lab and I was invited by Doug Rea of the College of Graphic Arts and Photography (RIT) to take part in an International Studio of Electrography at the 20th International Bienal at Sao Paulo, Brazil. I was one of three electronic photographers set up in the studios at RIT. We received our assignments by fax from Brazil and then arranged our models and began shooting. We then took the two inch floppy disks from the digital cameras and went to the electronic photography lab where we processed them on computer. They were then printed on a laser printer and sent to Brazil via the fax machine. Brazil sent their comments back to us at RIT, and sent our images on to Spain. It was an afternoon of excitement, amazement and awe. The world seemed smaller and more connected.
**Equipment Used**

**Hardware**

- Macintosh IICx
- Canon 701 Still Video Camera
- Kodak SV7500 Still Video Multi-Disk Recorder
- Kodak SV6500 Still Video Printer
- Apple Flat Bed Scanner

**Software**

- Studio 8
- Modern Artist
- Image Studio
- Applescan
- ColorStudio
- Photomac
- Proviz
- Stuffit
- Supercard (For preliminary tests)
- Macromind Director (For preliminary tests)

**Typeface**

Olive 24 pt.

**Sound Track**

Mark Isham
- "Vapor Drawings" 0 - 3:54
- "On the Threshold of Liberty" 3:54 - 5:19

Michael Hedges
- "Aerial Boundaries" 5:19 - 9:52

William Ackerman
- "Ventana" 9:52 - 14:53

Alex de Grassi
- "Western" 14:53 - 18:46

David Lanz
- "Spiral Dance" 18:46 - 26:46
Part Three

Summary
Summary

As new developments in quantum physics give us new perspectives on ourselves and the nature of the universe, the information generated will bring about a new vision of reality. We will begin to understand humanity’s interconnectedness and with that the tremendous need to communicate.

We will have to find more efficient ways to process this avalanche of information to survive, but more than that, to be productive. Methods of processing, allowing the user to select and prioritize information for himself are imperative. Information visualization, interactivity, networking, interactive television and other yet undeveloped interfaces are where the future of communication lies. Imaging will become increasingly important. Images help create a shared reality, linking us one to another.

Electronic image transmission could be one of the most powerful of the new technologies. The image has power because it helps to distill and synthesize large amounts of information quickly. People will have access to images from around the world. This in itself will be a catalyst for change. Governments will lose their ability to paint perceptions for their people. They will realize the amount of information available and will give up the idea of tampering or manipulating it. Realizing the benefits of cooperating on a larger scale, socially, environmentally, and economically will lead to the formation of a world federation. Structures for world peace will have to be worked out.

Access to the instant transmitted image from every corner of the globe will soon be possible. Computer links between scientists living hemispheres away will be able to share data, even scientific visualization of that data. Educators will have access to libraries, databases, and art galleries worldwide. Every book ever written in any language will be available electronically. Children will have unlimited opportunities at their doorstep with interactive learning environments. Children with disabilities will have the opportunity to participate in worlds previously closed to them.

Imaging as well as human expression - art - reflects the culture from which it arises, a culture where individuals are coming to terms with their own impermanence. How we perceive ourselves
and our world and what we communicate is extremely important. We hold in our hands some of the most advanced and powerful communication tools. How we use them is up to us.

Electronic imaging is a field that unites art and science. Art and science teach us to see, to see what we otherwise would not see. They pull us along the path of discovery, captivating and enticing us into learning and growing, into being and becoming.

Science as well as art must be balanced by a spiritual consciousness, as two wings of the same bird. Only then will flight become possible.
Appendix

Video Stills from "Oneness Heart"
Plates

1. "Earth" - Electronically painted image ........................................ 4
2. "Dimensions of Self" - Electronically painted still video image.. 10
3. "Man on Hillside" - Electronically painted image ...................... 15
4. "Man and Woman" - Electronically painted still video image..... 21
5. "Mankind" - Electronically painted image ................................. 25
6. "We Are One" - Typography .................................................. 28
7. "Birth" - Electronically painted still video image ...................... 29
8. "Universe" - Electronically painted image ................................. 30
9. "Boy" - Electronically painted still video image ....................... 31
10. "Greatest Name" - Electronically painted image ...................... 32
11. "Know Your Human Right" - Still video image and type ........... 33
We are One
One planet
One people.
Know your human right
be what you’ve
come here for.
Notes


2. Ibid., p. 16


5. Ibid., p. 37

6. Ibid., p. 38

7. Ibid., p. 38


11. Mahatma Gandhi, words attributed to Gandhi in a film on his life, 1983.


13. Ibid., p.12


19. Ibid., p. 619
Bibliography


