

Ralph Abraham

I come from a very obscure background: thirty-three years studying the mathematics of vibrations. In the middle of this career there came a holiday of some three years when I went off the professional track. When I returned from the Himalayas about eleven years ago, I found to my surprise that I was still interested in vibrations, but not just the mathematics. I was interested in the real thing. And so at that time, in 1974, I built a machine named the Macroscope. A name inspired by a science fiction novel. Some of you know it. The idea was to make vibration visible. The metaphor of vibration occurs in traditional literature about the higher things. So, what we are seeing is fluid a little thicker than water, a transparent fluid, being seen through a Macroscope which makes its vibration visible. This is, I have no doubt, what a dolphin sees in his melon receiving vibrations created by himself or others. So this is fairly simple. No computer graphics. No analog computer. No digital computer. A very cheap machine. It makes the real vibration in a transparent medium visible. Even in air this machine is so sensitive that if you light a match, it will show the heat waves. So we're seeing extremely subtle vibrations in the fluid caused by the music that you hear. It is the nature of fluids to make these patterns when vibrating,... a droplet, a biological cell, a liver, a stomach, the ocean. When you look through the swimming pool at the bottom, this is what you're seeing.

Eventually this led to my swimming in a tank with the Lilly's two dolphins, Joe and Rosie. During this swim I did try to communicate with them in this fashion using different kinds of clucking sounds which I had tried out and found that they made a certain pattern in this machine. They both became extremely excited. The people who watch the tank there admitted that these dolphins had never been so excited. So something happened and indeed we fell in love. It was an alien love, extraspecies love.

Then eventually it led me here, four months ago, to a talk where I spoke about visual music, a very established medium into which has recently arrived computer graphics. And as we have seen this morning, there are many things that computer graphics can do in the area of visual music. For me there was a different significance to the arrival of computer graphics as a reasonable partner with visual music, and that is that it makes possible the incorporation of mathematical ideas: visible mathematics. If

there's one thing that computer graphics is good for it's making mathematics visible, particularly the mathematics of dynamics. That's very important because we previously have had no way to make visible to the outside world moving mathematical images in the mind of a mathematician, not even to each other. Now the possibility is not only to put them in with music, to use them as the backdrop of a film or something, but use them as artistic elements in intentional creation because the mathematical algorithms are not only visible on the screen but are in fact the easiest way to create new imagery.

If there is a hinge of history then it folds between a future and no future. That is what many of us are feeling now. Can our evolution continue? We want to create the future, a beautiful one, not necessarily according to our own design but according to some better design that we will help pattern. To go over the hinge of history toward yes, we want to raise the intelligence of society. Do you know about Luis Machado? He was the Minister of Intelligence in Venezuela. He was the only Minister of Intelligence in any government of the world. He got this idea that intelligence is our birth right and that our manifest destiny is to be intelligent and to have the pleasure and wealth of that. Unlike many people who may have had this idea, he happened to be a personal friend of the president of Venezuela who liked this idea. So he was made Minister of Intelligence. He is using the best techniques of the most radical educators around the world in public media programs and retraining the teachers in the schools, effectively raising the intelligence of the populace of Venezuela. His goals are maybe national or beyond. Our goals are planetary and solar. We want to create a society with the stars as our manifest destiny so let's go. We've got to raise intelligence because this whole trip now is just too stupid. We could be more optimistic if this intelligence was trainable. I'm using the word 'raise' because I want to suggest something which I think Luis Machado is not talking about. I want to raise intelligence vertically, not just learn how to solve physics problems better. I want to increase the connection to the divine plan so that we can receive whatever is necessary to get past that hinge in history.

Return to Center is actually the name of a book by Father Bede Griffiths. He is this guru in the south of India who is also a Catholic priest and monk of the Benedictine Order. His idea, like many people but he says it so well, is that we have our terrific society here with these things like computer graphics, but they're all

peripherals of some master computer which has unfortunately been turned off. So these peripherals can't actually do anything. There's no center. You could call this a lack of integrity. Sometime in the recent past, it might have been only five or ten years ago, the last person with integrity died. Society is totally without a center. Father Griffiths has written a little algorithm for regenerating the center. No matter how much intelligence is raised, unless we have some kind of integrity, this technology will not only be used for what we see now but some people will use it for what some people would say is bad. These bad uses for everything which we manage to create enormously outnumber the good uses, which gives us a certain feeling that there is a downward spiral. We need a return to center. Could this technology be used for that? This is a balancing act because the thing is sort of on tilt. Jose Arguelles is coming from this super scholarly art history direction, looking at the whole history of art through all of the cultures on Terra from the perspective of a traditional Buddhist. He says that there are certain artists who are special: sacred artists. Sacred art is some sort of thread which always existed throughout time and what those people are doing is a certain absolutely essential something without which evolution can't happen. Sacred art is the evolution of a planetary society according to a design which has not only a future but a beautiful and paradisiacal one. If we have to choose between several I guess we could take a vote. Those computer graphics and visual musics we create could contribute to a planetary art. Is that a possibility? Can we get money from the National Science Foundation to further that? Will that solar society be lovingly beautiful or military - *Star Wars, Starfighter, Tron* or what? I loved *Tron* too, but let's face it, on the content level there's a certain lack of center. It needs a return to center. I'm not criticizing. Maybe certain compromises had to be made in order to be commercially successful. In that case we could perhaps lay the blame at the feet of the people who go to the theatre and put their nickel in the slot. Why do they always choose that? Can't we do something about that with this media?

For the five M's I want to suggest a possible way in which we could relate the technology at hand to the questions that have been raised. Just one of many possible bridges we could try and build in our minds. M (number) one is MUSIC. That's the music we're all familiar with but there is a theory, particularly in Indian music, about the emotional values of notes, scales, and sequences. I want to suggest that the emotional, the intellectual, the physical, or whatever content

of music, is specifically our goal because it has vibrations. It resonates with different aspects of being and consciousness. It has an effect upon a person even without words, and when you add words, when the lyrics are properly coordinated, then the effect of each is enormously enhanced through the recruitment of different centers of the brain according to a common something or other. This integration of different aspects of consciousness into a coordinated activity, as I have described, is specifically our goal. M (number) two is MOVIES. Something more like Vibeke Sorenson where we have music, maybe even with lyrics, and the images and other stuff are coordinated sufficiently well that a resonance of three different centers along a certain vibratory mode which was the intention of the artist who created that. Now M three. I want to use the fact that artists doing this can't resist using computer graphics anyway. They're available, affordable, programmable,... and happen to be supremely suited for presentation to people of dynamical mathematical images. Music, movies, and MATH would then be coordinated into a combined medium from the viewpoint of raising intelligence and discovering if it is possible to influence the return to center through the presentation of some kind of content with this medium. And four, MYSTICISM.

We have in our history this species called mystics. It's a default category for people who can't be called anything else. Mystics, by one means or another, ...MEDITATION, a very important M..., have a direct experience of some other reality but their efforts to communicate, to us who are left behind, are unsuccessful. So the philosopher's argue about whether or not they saw what they were seeing. In the writings of these mystics there are always, ...even when they come from completely different cultures..., a commonality of themes like vibrations, for example. I have my own experience with this reality. It appears and sounds simultaneously as a continuously, infinitely everywhere-extended field in which vibration is taking place. Words insult it. The Tao that is spoken is not the Tao. You cannot fit it into words. There is this injunction in every tradition. If the reality of mysticism is a dynamical one, and words refer to fixed constants, then it's impossible to wrap into words the simplest experience of the divine. It's not hard to remember the last time you visited there but it's very hard to say in words. Could it be that this technology will allow us to go beyond where words can never go in communicating with each other?