

Stephen Nachmanovitch

*Being Present:
Improvisation, Observation, and Links
between the Art of Performance and Medicine*

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Introduction:

My name is Gary Hammer, and I serve as the director of the endocrine oncology program in the Comprehensive Cancer Center, and the director of the Center for Organogenesis in the medical school, and I am just delighted to introduce our guest speaker today on behalf of the Medical Arts program. The program, sponsored in part by the University Musical Society, and led by Professor Joel Howell, is all about the intersection of medicine and art, and the myriad ways we might envision such an intersection. It was organized on the premise that exposure to the arts can help medical trainees and really all of us become more effective and human physicians. While trainees can read about concepts such as pain, loss, grief, or fear, it may be difficult at times to understand these experiences in their patients. The arts, however, can help engender a sense of empathy and help audiences experience the human condition from a different perspective. (That's a quote from Joel Howell). We often speak of the juxtaposition of the science of medicine and the art of medicine. Many of us go into medicine with a love of people, and connection, and desire to help – the art of medicine – perhaps naïve, perhaps ideal, but as we'll see, this is all good. To me the science of medicine is at first the biochemistry, anatomy, and genetics that we learn. But it later becomes, as those of us in the audience who see patients know, it becomes that scripted dialog of gathering information about the present illness, past histories, medical, social history, family history, the physical exam. In that scripted task, and the hurry of medicine, the art can be subdued, and really hard to engender. And the art of medicine perhaps is between the lines of the dialog, where the relationship between doctor and patient is forever the improvising of the ever-changing experience of illness. And that dance requires a reawakening of that naïve spirit.

Embedded within that phase is Stephen Nachmanovitch. Stephen performs and teaches internationally as an improvisational violinist, and at the intersections of music, dance, theater and multimedia arts. He is the author of *Free Play: Improvisation in Life and Art*. He studied at Harvard and the University of California where he earned a Ph.D. in the History of Consciousness. His mentor was the anthropologist and philosopher Gregory Bateson. He has taught and lectured widely in the united States and abroad on creativity and the spiritual underpinnings of art. A pioneer of free improvisation on violin, viola and electric violin, he has collaborated in with other artist in media including music, dance, theater and film, and has developed programs melding art, music, literature and computer technology. He has presented master classes and workshops at conservatories and universities, and has had numerous appearances on radio, television, and performing arts festivals. He has published broadly since 1966, and has created computer software including The World Music Menu, and Visual Music Tone Painter, which explores the relationship between visual and auditory experience in music. He lives with his wife and two sons in Charlottesville, VA. Perhaps influenced by

his wife, who is a hospice physician, he has explored deeply the nature of the doctor-patient relationship as well. He helps us regain the art of medicine through our recapturing of that naïve place of being present. And with that I welcome Steve to the podium, where his lecture is titled “Being Present – Improvisation, Observation, and Links between the Arts of Performance and Medicine.” Ladies and gentlemen, Stephen Nachmanovitch.

Stephen:

Thank you so much! It is a privilege to be here, and I thank you all for coming. I’ve had a fascinating week here at the University of Michigan. We just concluded an improvisation festival with improvisers from all over the world. The interesting thing about a gathering of improvisers, unlike many other academics or artists, is that the thing that unites us is not subject matter, or style, or the particular type of work we do, but rather the *process* we share. The process of improvising brings us to many possible places.

Today we are together in this room, where our process involves 300 of us sitting together in chairs. So to begin with, why don’t we try an exercise. As you sit in your chair, pick out any two of your vertebrae and concentrate on them. They can be adjacent or non-adjacent, and can include your skull and your sacrum. As you are aware of these two vertebrae, very subtly and almost invisibly contract the distance between them on the right side and increase the distance between them on the left side. And as you breathe out, very subtly reverse that movement and contract the distance between them on the left side and increase the distance between them on the right side. You can keep working with this pair of vertebrae for the entire hour that we are here. The interesting thing about this method is that when you are in an academic or professional setting, where it might be undignified to do some of the more dramatic things that improvisers do to warm up and become present with themselves, you can do this, and it’s invisible. You have 24 articulated vertebrae, plus your sacrum and your skull; there are 325 pairs of vertebrae that you can play with. So there is more than enough there to keep you occupied for many years!

As we play with our vertebrae, let us notice the utility sounds in the room. We can hear a kind of rotary sound back there from the heating system. ... Two people have coughed, one on each side of the room. ... There is a faint treble buzzing from fluorescent light bulbs. ... Someone just put something on the table, there was a clunking sound. ... And now, the sound made by the zipper of a jacket ... In the normal context of giving or listening to a public talk, these little *sub rosa* noises are of course irrelevant; nobody cares about them; but I find that when we start listening to these sounds actively, they actually become quite interesting. Every time I hear one of these sounds, I notice that not only is it an interesting sound that has its own kind of time-course and mixture of overtones, but it is very spatialized. As you listen to these sounds (someone clearing their throat, an object moving in the room), you become aware of where this sound is in three dimensions. As a result we become aware of where *we* are in three dimensions; we become aware of all sorts of atmospheric, mechanical, environmental and social contexts which we usually take for granted. {3}

As a professional musician I am also a recording geek, interested in microphones and

pre-amps and so forth, preoccupied with the problem of how to capture sound beautifully. Our whole idea of stereo sound as a way of capturing sound in space is of course worthless when you come to the immense sensory riches of the subtle sounds that are happening right now in this room. Even if you have 5.1 surround sound with speakers in the rear, you are still not going to capture the sense of spatialization, because we can also hear sound in the vertical dimension: is it coming from up there or down there or diagonally across there, our perception of sound in space, and our perception of ourselves in space, is extraordinarily refined and contributes enormously to our capacity to be *present*.

[Someone coughs].

That cough in another context would have been irrelevant, but in this context it is really interesting. We can hear the different timbres and the different sets of overtone frequencies of different people's coughs as they begin, continue and end over a brief period of time – which to you as physicians might be significant data. The bass rumble of the two trucks that are just going by outside, and the random noises of somebody closing the bathroom door a few doors down, all sorts of noises – we get drawn in by the endless storytelling of the sounds around us. One of the disturbances in this fascinating environment of sound is my voice, so I feel that I am being kind of crude and brutish by talking at all and covering over these interesting environmental sounds.

The awareness that we cultivate in these little exercises is the raw material of improvisation and creativity in many fields.

When we talk about *being present* (with the interesting treble whish of this next truck that just drove by), we are inhabiting a multimodal world that is 3 dimensional and 4 dimensional if you include time, and perhaps there are other dimensions, a world that is multisensory, with not only our five normal senses, but with proprioception, and many other kinds of senses like temperature. This multimodal sensorium is a world that you as physicians are familiar with because you have a practice called the physical exam. So you have access to immediate, present 3-dimensional data about another human organism, and that organism's relation to his or her environment and other organisms and everything around. When you are present with that other human being, you are able to collect data on dimensions that are virtually impossible to capture by instruments, or by any other means, because there is no instrument that has as many dimensions of sensory awareness as you do. There are instruments that can record electromagnetic vibrations at frequencies that you can't experience directly: x-rays, ultrasounds, MRIs, and there is clearly a lot of use for the instrumentation, however the subjective experience is so extraordinarily rich.

As the benchmark of improvisation in medicine, I take a remark that a dear friend of mine made many years ago, a pulmonologist in San Francisco. He was a left-brained, very logical, scientific person. I asked him, what does improvisation and creativity mean to you in your field? He immediately answered that it is seeing the patient who is right in front of you, not a textbook case or generic diagnosis, not a generalization or a statistic. To see another human being and encounter him or her, and be present with him or her, is an extraordinary thing. That is really the essence of improvisation. There are people who

think that in music, if you are playing without notation, a score, a plan, a discussion beforehand, or any other template for your activity, that what you are doing is somehow random or you are just doing anything. But of course you are not just doing anything, you are doing something that is clear, connected to itself, patterned, because you as a highly patterned living organism, in relationship to this room, to this instrument, to your encounter with the physicality and the difficulties of your instrument, in relation to gravity and all the Newtonian forces that relate you and your body and your instrument. None of that is random. All of that is immensely structured. You as an individual are a product of 4.5 billion years of organic evolution, all of which was immensely structured and that structure came from the accumulation of untold myriad events, each of which was absolutely unique.

Last night I worked with a group of 24 medical students, feeling lemons. We played a game in which there were two groups of twelve participants; they were blindfolded and given lemons which had been marked with numbers. They had a chance to get to know their lemons while blindfolded, which they did socially – they spontaneously knew they had to share information and pass lemons around, discussing them and helping each other. When they were through helping each other understand their lemons, they put them into a couple of paper sacks and then they took off their blindfolds and dove in to find their lemons. The result, which seemed amazing, but which I have found to be quite reliable over the years, is that the identifications were all correct.

All of these lemons belonged to the same species, the same breed, the same crop, from whatever place of industrial agriculture they came from, and they all shared some characteristics that can be understood statistically and taxonomically. Yet, as the students discovered, each lemon is a unique living entity, a once-in-the-universe, never-again-to-be-repeated individual. And this is so much more so for human beings. We discovered many connections between the lemon exercise and the physical exam, the multisensory and multimodal way in which doctors, and experts of all kinds, gather information.

What is interesting for me as a musician who works without notation (and without templates that resemble notation or may substitute for notation), is how you can interact with a particular situation and find yourself in a place that is precise, structured, beautiful, and unlike any other place, and do so in cooperation with other human beings.

There is a story told by Eric Cassell in his book *Talking With Patients*. He describes a cantankerous, wealthy patient who was quite ill before and after an operation. He was used to having everything done for him by servants, and now, in the context of a hospital where he was relatively powerless, there were all kinds of problems getting him to cooperate in his own treatment. The intern who was with him during the weekend figured out all kinds of psychological tricks, and she actually wrote up the patterns she discovered in his chart. Cassell came in on Monday morning and saw these descriptions, and said that he had never seen anything like this in a medical chart before. There is of course the whole panoply of objective information that gets into the chart, and there might be some kind of notations about the person, but he had never seen this level of description of how the doctor as a person interacts with this patient as a person. Now that was quite a number of

years ago, and I know that there is a lot more movement in medicine now towards humanistic interaction with people and towards understanding communication, but I believe it has yet to hit the core of medical practice. And like improvisation in any art form, the understanding of a patient as an individual is very hard to standardize.

In my hotel this morning, I noticed a story on the cover of *USA Today*, about a study highlighting the poor quality of doctor/patient communication today, but also mentioning that this is a subject that is now being taught more explicitly in medical schools, using actors as standardized patients and other methods. The study of doctor-nurse-patient communication, like medical ethics, like medical humanities, like the relation between medicine and the arts and other fields, used to be taught as an extra condiment, or a dessert, or a non-essential piece that you had to slap into the main meal of the curriculum, but it was not central to your daily functioning as a doctor. There is a lot more understanding now of course that these things are central, and that the multi-dimensionality and the multi-modal understanding of human beings is essential and is not some kind of peripheral vision on the side. Cassell was wishing that some of this psychological, social communicational information could be in charts. Of course that would be difficult because we know how incredibly harried and busy doctors are, rushing from one patient to another, and just to notate the objective information with check boxes on an electronic medical record is hard enough. At least now with electronic records you can type some notes and at least somebody else will be able to read them, instead of some kind of squiggle. But it's a difficult matter to communicate about this. You often understand all these personal things about your patients quite well just in your head, but then if another doctor has to take over that patient, then that information has to be communicated and it is hard to do that.

After reading Cassell's story, I was struck by how interesting it might be to compare the medical chart to the musical score. In the musical history of Western civilization there are two fundamental dates: 1225 and 1875. In 1225, Guido of Arezzo, an Italian monk, invented music notation, which is the digital representation of music. Digital in the sense that a tone can be labeled an A, a B flat, or a B, but not in between. Similarly the rhythms are notated digitally, a half note, a quarter note, a dotted eighth note. In 1875 Thomas Edison invented sound recording which is the analog representation of music, in which the wiggles of the sound waves are represented on the wiggles of the phonograph record, and so you are able to get a much richer recording of what's going on. So from the digital representation back from 1225, you have people's best, sincerest attempts to communicate, to teach over the distance of space and time and over the generations. But there is always fundamental information that is missing that's kind of the order of what we were experiencing when we were really listening to these 3 dimensional sounds here, which cannot be captured on a recording.

A friend of mine, who is a fine conductor who works within the confines of straight classical music where everything is notated, said that the score can tell you everything about a piece of music, except how it goes. How it goes, you learn by experience and by an oral tradition. Within the history of not just western classical music, but in Indian classical

music, of Jazz, any of the Balinese gamelan traditions which are carried on village to village: all of this information is transmitted orally and aurally, teacher to student, parent to child, person to person, friend to friend, because it has to be experienced in the room together, which is why we are here in a school in a room together where we can talk and experience each other rather than just having some kind of objective digitized set of so called knowledge which ends up being impoverished knowledge that doesn't tell you how things go. The transmission from teacher to student, friend to friend, of how a particular kind of music goes, how things are inflected: what are the styles of a particular tradition of laboratory science, what are the styles of a particular tradition of natural history.

I came to some of these perspectives through my teacher, Gregory Bateson. Gregory's father, William Bateson, invented the word *genetics* and cofounded the science; he came from the 19th century British natural history tradition that gave rise of Darwin and many others. In those days, biology was (as it still is) divided between laboratory science and natural history, but the vast majority was natural history: going out in the field, observing life forms for yourself, in context, finding the variety of phenomena out there and expecting to be surprised. With the enormous growth of knowledge from laboratory science in the past century, we have obviously moved farther and farther towards the digitized, fill-in-a-box methodologies: you create a hypothesis, you do your best to determine how the results skew on one side or another of the curve that you are trying to draw. But you are often missing the natural history experience. You are attempting to aggregate data into larger and larger values of n , and what you gain from that of course is enormous power to generalize (because you are getting information that is cross-personal, sometimes cross-cultural), but then you often are missing the information that is situational, contextual, and dependent upon the individual. So when Gary was referring to the art and science of medicine, part of what you are playing with is constantly vibrating between science and art, it is not: is it a science or is it an art? Can you do so much of science or so much of art? But practice is really a matter of being able to constantly vibrate between what you gain from both of those points of view, because they are both extraordinarily important, and you can't take care of people without both of points of view operating all the time.

In music, even if one is playing without a plan, without a score, without a template, there still is a sense of quality. You can still screw up, and people are aware of this and it is often hard to define what constitutes screwing up, but you actually do know when it happens. Going back to the more laboratory experience view of many ends of data, you as a person who has gone through life hearing a lot of music, seeing a lot of art, seeing a lot of movies, hearing a lot of environmental sounds like this, you really get an extraordinary sense of quality, whatever that means to you, even if you can't define it. You are as it were, intuitively, and by intuitively I mean rapid calculation of an enormous amount of data that takes place like that (Stephen snaps his fingers) because it is not conscious, you intuitively are able to compare your sense of quality and your sense of what is interesting, and your sense is what is too much of this and too little of that to what you are doing and adjust it by a continuous process of feedback.

As we play with our vertebrae – which we can continue to do through this hour, but we can continue to do for those 325 iterations of all the pairs of vertebrae that we have over the next dozens of years – we are playing with that sense of balance, with the feedbacks, all the dynamic activity that allows me to stand up straight, and not fall over. That same set of complex feedbacks allow me to sense what makes sense, when is somebody lying, when are you collecting information from somebody and you realize that they are talking about this set of syndromes but they are completely neglecting to talk about that, because they are ashamed of it or because they take it for granted, or that sort of thing. Those deep sensitivities that you develop as a human being, which are artistic sensitivities, are sensitivities that you have to use in collecting data from patients, because otherwise you actually have no idea what is going on.

In 1912, Freud wrote a paper on psychoanalytic technique, dealing with the problem of how the analyst can track and absorb the vast amounts of information that arise, without being sucked into premature conclusions, diagnoses, and interpretations. The danger, he said, was never finding anything beyond what is already known. He spoke of cultivation “evenly-hovering attention” – very similar to what is now being taught in medical centers by Jon Kabat-Zinn as *mindfulness*. The method is – for a time – to hold back, allowing the information to wash over you, attending to everything while focusing for the moment on nothing. To hold the balance between your expertise and the unique person who sits in front of you.

To improvise is to be completely present right here in this place and this time. Peter Brook, the film and theater director, wrote a book called *The Empty Space*, in which he asked what is the place of theater in our contemporary world where we have movies and TV? Before movies and TV, in the days of Ibsen let’s say, you could go to the theater and see a beautifully written play that was well acted with lights and sets and costumes, and that was a wonderful thing which you would never see anywhere but the theater. Now we can see those things often better on movies and TV than you can in the live theater. So the question is: what is the place of the live theater when we already have the capacity to do scripts, acting, sets, lighting and so forth? In live theater, you can do what can *only* take place *in* this room, *at* this time, *with* this group of people. Whether it is an improvised piece or a composed piece, there is a sense of context, a sense of acoustics, a sense of social atmosphere, a sense of exploring why we are together in this room now, that is never going to happen again in the history of the universe, that cannot be replicated. Each event will always have an *n* of one.

In a sense that is what you are doing in a physical exam, in your patient history and all of the things that you do on a daily basis. You are always and inevitably juggling these two things: developing a knowledge of a vast number of cases so that you know what you are seeing and what has happened to other people, and at the same time cultivating awareness of the absolute uniqueness of this particular person and the surprises that are going to happen in this room, and the information that is arising from this room that is not never going to arise anywhere else.

And now, questions and ideas please!

Q: This is really a great intersecting talk. I'm from public health and I did hear a few comments about statistics. But my mind was immediately glued to a situation with penguins that are freezing together in the Antarctica. In a huge statistical mass, somehow each parent is able to find the cry of its own individual baby penguin. And then if you listen to them *en masse*, then they all have a kind of sympathetic tune, which is like a voice of the entire population. So from the point of view of health management policy, I think it is important to listen to the voice and the needs of the population and if those are forgotten, then the population becomes marginalized. So I think your views on uniqueness also apply to groups of people.

You mentioned the importance of experiencing the moment, and it sounded a little bit like William James, who was working at a time when laboratories were becoming important, especially in psychiatry, and he focused on experience, included in his book *Varieties of Religious Experience*.

Stephen: Yes, that is really an important book, thank you very much. James communicates so much in the key words of his title, *varieties*, and *experience*. Religion as an active experience rather than a thing or an ideology, and an experience whose varieties are as great as the variety of the natural world. Two ideas of which we are badly in need more than a century later.

When you mention that the voice of the statistics and the voice of the aggregate, I was thinking of one of these environmental listening experiences that I had many years ago. I was in New York, sitting some place on Staten Island and I heard this extraordinary bass kind of bellows sound around me that was going "Wough! Wough! Wough!" in a slow, steady rhythm. I kept looking around me to see what the heck is this? This was a fascinating sound. I suddenly realized what I was hearing was the statistical aggregate of all of the sounds of Manhattan coming across the water and creating a summation.

Q: (Joel Howell): I wonder if you could comment a little bit about tension. The music of tension in medicine. We have talked about creative tension and you talked about the tension between listening to your voice and listening to the ambient sound. I am on the wards right now, and this morning there was a lot of tension on the wards because we were trying to grapple with conflicting needs of our patients and the conflicting needs of the house staff and medical students who hadn't had any sleep and were feeling tired. A lot of tension going on and out of that I think there is the danger sometimes of seeing it as a dichotomy, choose one or the other, and of not recognizing the creative potential that can arise when you are talking to a patient who is telling you one thing but you are really feeling something else. When all lab values were over here, but there is one lab value that is over here. When you are playing a piece of music and you have the notes in front of you and you want to be free-form, but Beethoven wrote a C-sharp and just how far do you want to veer from that C-sharp? Is there some creative potential that comes out of

appreciation these differences as a source for making better music, making better medicine? Is there a danger in trying to say this is the right answer, forget the other answer? I guess I have kind of answered my comment.

Stephen: Yes you have answered your comment, but that is an amazingly clear formulation of that issue. What you just created is a koan, in the sense that it is a question, and the answer to the question is the fact that you are always going around asking the question. It is not that you are going to say that it is A or B. It is that you are continually living in the tension of that question, and are comfortable living in that tension. One of the tensions also, when you talk about being on the wards and you were saying as were walking up here something about I forget how many codes, you had a tough night with a lot of people coding. So all of you guys are running around in a context here that is hardly meditative, and every one of us here recognizes the value of being able to step back and see that amazing piece of data that is going to pop out at you from a person or from your research or from whatever you are looking at, which requires being quiet. However how much time to you have to be quiet during the day?

Now, the interesting thing about what we are still doing with our 325 pairs of vertebrae as we sit here, is that no matter how busy you are, you can actually still do that. And no matter how busy you are you still have the capacity to breathe consciously. There is a great line from William Blake where he says,

There is a Moment in each Day that Satan cannot find
Nor can his Watch Fiends find it, but the Industrious find
This Moment & it multiply. & when it once is found
It renovates every Moment of the Day if rightly placed.

He also says:

Every Time less than a pulsation of the artery
Is equal in its period & value to Six Thousand Years.
For in this Period the Poets Work is Done: and all the Great
Events of Time start forth & are conciev'd in such a Period
Within a Moment: a Pulsation of the Artery.

He talks about seeing the world in a grain of sand and eternity in a moment. And it is possible to cultivate this practice. At the same moment you are practicing medicine in conditions of high stress and importance, you are also practicing breathing, you are practicing sitting, you are practicing wiggling your vertebrae around. There are all these practices that can go on simultaneously. Our contemporary society and the economics of the medical profession, or as it is becoming more and more the medical business, are putting the screws on both you and your patients, more and more, trying to squeeze more quantitative units of productivity out of your day. It is an exquisite torture that doctors are under all the time to do more and more and more with less and less time. Battles will have

to be fought over these life and death issues. Yet you have the capacity to cultivate that breath, you have the capacity to cultivate that one second pause where you can become aware of the environmental sounds and let that take you some place.

Q: This idea of being aware, being in the moment, being here now, Proust talks about that in his novels ... there is that recent book *Proust was a neuroscientist*. Today our attention being ripped away from us, and that is more or less the goal of the society we live in now. Television and commercials for example, we are always switching from one thing or another. Now the research is coming out pretty clearly that multitasking is a lame-ass idea. It doesn't work. People don't multitask, but we want fast flow. We are right here now. It is the best we can do as human beings and that is to advance our creativity, and not just our creativity, but our humanness, whatever that is, exists.....but to just do it, is notoriously difficult ... it's enlightenment essentially.

Stephen: Yes, it is notoriously difficult, but it is available to every human being, just as the ability to improvise. The practice of improvisation is actually not any different from conversation and each one of us has innumerable conversations every day that are perfectly lucid and organized and structured and we didn't write down what we were going to say before we say it. So we are all improvisers. We are all capable of this. When you mention enlightenment, that sounds like an awfully fancy term, but at the same time it is universally available in the moment of your breath, in the moment of wiggling your vertebrae, in the moment of whatever practice you choose to engage in. Jon Kabat-Zinn talks about mindfulness, cultivating mindfulness meditation in the medical world both for practitioners and for patients. These terms like enlightenment remind us of the Buddhist world, and of course there are extraordinary practices and literatures created for the past 2,500 years from the Buddhist world on how to do this while you are in the midst of stressful, difficult activity. But to say that practice or mindful breathing or enlightenment or any of those terms is Buddhist, is like saying that gravity is English. Newton figured out the patterns by which it works, but it happens here too.

Q: Hi, I am a first year medical student here. I was just wondering, I appreciate creativity, but the more I learn about the medical culture, the more I realize convention plays a huge part, like standing on the right side of the patient and just things such as this. So I was wondering if you were to start all over and you were a medical student today, how would you practice creativity but respect the conventional medical rules or whatever?

Stephen: This is *the* question. Both sides are extraordinarily important. As with Joel's remarks earlier, what you just stated was a koan. It is question, where the question itself is the answer. The fact your being willing to reside in the central tension of that *is* the answer.

Q: Well, but what YOU do?

Stephen: One of the differences between my field and your field is that if I screw up at a concert, people might not like it and they might not come back; if you screw up in your field somebody can die. So there are certain very serious reasons for the conventions that have been established and have been found to work. Though there may be other conventions that turn out to be based on “that is just the way we do it here,” and which may be counterproductive. To figure out which is which is a matter of lifetime investigation for the practitioner. But the fact is that being involved in urgent matters of life and death, while it does not excuse us from those investigations because you also never find anything out if you reside entirely in the conventional.

There are other fields in which improvisation and creative re-visioning are required while life-and-death decisions are being made, for example, in the field of intelligence. We now know how before 9/11 there was significant information burbling around among intelligence and political professionals, who they did not, as we like to say, connect the dots. Like medicine, intelligence work is a field where it is important to *see* something that is unusual, not fitting into existing paradigms, that may be a one-of-a-kind, once-in-the-universe case, and understand what that is in context with a lot of other pieces of information. But at the same time, the professionals in that field (and the stakes are life and death), are under the requirement that they stick within the institutional guidelines, that they don't jump up above their superior to the next level and scream and complain about not being listened to, that they respect the boundaries between one department and the next department – not that different from academia, medicine, corporate business, and many other fields. It is a mysterious art to be able to *see* the field of data. What you were just addressing, the question of how do you go through your day and your whole professional career respecting the conventions and at the same time being free with them and seeing things for what they are – that is another one of these koans.

The really important thing, as we keep playing with this metaphor about we are about our vertebrae and how we are able to stand up straight and sit up straight though the constant regulation of opposite tensions. This is actually a natural human ability to regulate opposite tensions and not flop over on one side or the other. So, just as we have the capacity to be meaningfully present in every moment and see the face that is right in front of us, we have the capacity to navigate those tensions. And then we have (as you mentioned regarding TV and the media and so-called multitasking and so forth before), there is enormous social, economic, political pressures on us to lose our minds, to see our minds fragmented, to become consumers, to become little units within an industrial apparatus whose purpose is not to help people to heal patents, to make art, to have a happy life – that's a very other kind of purpose. So with every breath you have to resist those tendencies in your own way.

Thanks to Lee Hartline for transcribing the recording of this talk.