Keynote Address

EVALUATING UNUSUAL CLAIMS AND DEVICES USING A TEAM APPROACH: *A CASE STUDY*

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ABSTRACT

This talk will review the work of Jacques Benveniste and his development of a "Digital Biology" device. A team of scientists attempted a replication of Benveniste's claims using his device. The Interactions among team members and their management will be reviewed. The experiences and insights gained from this process may be useful as a model for studying unusual claims and subtle effects. Other models for studying and understanding the field of bioenergy also will be presented. This paper is based on Dr. Ives Keynote Address made at the Twelfth Annual ISSSEEM Conference *The Co-Creation Process in Energy Medicine: A Synergy of the Sciences and the Healing Arts* (June 14-19, 2002).

KEYWORDS: Digital biology, thrombin, fibrinogen, automation technology, coagulation, homeopathy

As Norm (Shealy) said, Wayne (Jonas) has been called away for personal reasons but he wanted me to bring his best wishes to you all. Also, that he is thinking about you and wishes all of us well in our days together here.

My talk today will be about a project that we did with Dr. Jacques Benveniste and his team. Karl (Maret) brought this up yesterday when he discussed some of Jacques' work. We are one of the other labs to which Karl referred. A branch of the United States government, the Department of Defense, became intrigued and perplexed by Dr. Benveniste's claims. So, a division of the Department of Defense, the Defense Advanced Research Projects Agency (DARPA) asked Dr. Wayne Jonas to put together a team to evaluate one of these claims.

One of the Samueli Institute's roles is to apply the best scientific methods to ideas of this kind. We are also attempting to develop good laboratory models and testable hypothesis for homeopathic effects. In this way, we hope to encourage the scientific community at large to test homeopathic theories and methods.

Using one of his own devices, we attempted to replicate Professor Benveniste's claims. I'd like to point out that we were not attempting to prove or to validate, or for that matter disprove, Jacques' claims. We were attempting to replicate Dr. Benveniste's experiments using his devices and his techniques—his "digital biology." This is an important distinction because in science one frequently attempts to disprove a hypothesis. That was not what we were trying to do.

With this in mind, Dr. Jonas put together a team of consulting scientists. The team consisted of seven people including Dr. Jonas and me. Dr. Jonas was lead scientist; I managed the logistics of the undertaking, oversaw the day-to-day running of the laboratory and performed one-third of the experiments. The other team members consisted of a statistician (and professional magician), an electrical engineer, a hematologist, and a communications/conflict resolution consultant.

Dr. Daniel "Chip" Denman is Assistant Director for Research Programs in the University of Maryland's Statistics Department and a founding member of the Washington, DC Chapter of the Skeptics Society. In addition, Chip is a trained

Figure 1. *DigiBio's robotic device and computer for experiments in digital biology.*

magician. We felt his credentials would allow him to address many aspects of the project we were undertaking.

Dr. Kenneth Hintz is a Professor of Engineering at George Mason University in Fairfax, Virginia. His job was to confirm that the devices and electronics were working according to specifications. In addition, Dr. Hintz along with Dr. Denman performed an analysis of the digital signal used in Dr. Benveniste's device. You can see a photograph of the device on Dr. Benveniste's company web page, www.DigiBio.com. Figure 1 is a photograph of the device set up on our laboratory.

Dr. McDonald "Don" Horne is a hematologist at the National Institutes of Health. Dr. Horne's expertise was valuable because the claims we were investigating involved blood coagulation in general, and the interaction between thrombin and fibrinogen in particular. I will return to the details of the experiment later.

Last but not least is Dr. Mitchell "Mitch" Hammer, a professor at American University in Washington, DC and Director of the Center for Crisis Response and Management. Dr. Hammer's expertise is in conflict and crisis resolution across cultures. His addition to the team is interesting and important in this kind of project. As an expert in the dynamics of community interactions, Dr. Hammer provided the necessary perspective and assurance that all parties were communicating effectively.

The value of effective communication cannot be overemphasized considering the range of participants such as the Department of Defense, University and NIH researchers, and pioneering researchers such as Dr. Benveniste. It is perhaps not surprising that these disparate groups might have difficulty communicating. I don't mean that we stopped talking; on the contrary, we were always talking, but we didn't always hear what the other person was saying. Dr. Hammer's job was to see that we all took the time to hear what each of us was saying. In this way, we managed to keep working together toward an agreed upon goal.

At this point I am going to go over some of the background that brought us together to attempt the replication. This will include Dr. Benveniste's hypothesis and claims. Then I will talk about the protocol that we used in our experiments. I have already mentioned the interdisciplinary team approach and we will return to this. I will end with some of our results and conclusions.

Dr. Benveniste's basic concept is that electromagnetic signals alone are sufficient to provide the information in biological interactions. That is, that the biology that goes on between cells in our bodies and in all of life involve electromagnetic signals. This, by itself, is not very surprising. Most biologists would accept this as a valid concept. However, if you take this concept and continue to push it, Dr. Benveniste felt that you could exploit that aspect of biology and manipulate it. Specifically, information from the electromagnetic signals can be stored in water and on digital media. Although controversial, those of us who have been doing research in homeopathy or practicing homeopathy in a clinical setting are not surprised by the idea that you can store information in water. But putting it onto digital media was extremely innovative. The U. S. Department of Defense found that to be the key element that caught their attention.

Dr. Benveniste made the claim that he could take the information that was involved in the biological signal and transmit it over the Internet and reconstitute it in plain water. The water would then behave as if it contained the original biologically active compound, although no chemical constituents would be present—only the electromagnetic signature and thus the biological information. According to Dr. Benveniste, these signals are specific. Thus, to pick a trivial example, if the electromagnetic signal contained the information from aspirin, drinking water exposed to the signal would relieve aches and pains. According to Dr. Benveniste, the electromagnetic signature of any biologically active compound can be recorded, transmitted over the Internet, and then reconstituted in water on the other end. If true, this would be extraordinarily important to all of us.

Some of the background for these concepts comes out of homeopathy and Dr. Benveniste's seminal work in the 1980's. Let's take a moment to review some of the principles of homeopathy.

The principle of similars is an important one to homeopathy; namely, the concept that "like treats like." This may be related to an important concept in immunology; prior exposure to a small dose of a toxic compound prepares the body to mount an immunologically protective response upon further exposure to the same compound.

Another important concept in homeopathy involves the concept of minimum dose. A homeopathic physician will attempt to give a solution or "cure" to a patient with the minimum dose necessary to produce the desired effect. Extension of this concept implies that the more a solution is diluted the greater its potency. Further, that there may be no lower limit to the degree of dilution possible. Thus, a solution diluted 100 times, 1000 times or even a million times increases in potency or efficacy.

This, of course, is where conventional science and homeopathy separate. Conventional scientific wisdom holds that there are distinct limits to the amount of dilution possible and still maintain biological activity. Specifically, Avogadro's number (6×10^{23}; 6 followed by 23 zeros) represents the number of molecules present in a solution containing one mole (for instance 59 grams of salt–sodium chloride) of a substance. Therefore, starting with a one molar solution (a standard starting point equal to one mole dissolved in one liter)

and making 13, 1:99 dilutions to produce a 13C preparation assures us that there is no possibility of any starting molecules left in the preparation. This would produce a concentration of 6×10^{-26} molecules, three orders of magnitude less than Avogadro's predicted zero point. Homeopathic practitioners do not disagree with this. However, whereas conventional scientific thinking would predict that there could be no biological activity in such a solution, homeopathic theory and practice tells a very different story.

Many practitioners of homeopathy claim that, contrary to conventional scientific thinking, the efficacy or potency of these solutions increases rather than decreases with increasing dilution. This afternoon in my second talk I will present data from my lab where we have demonstrated in controlled, double-blinded experiments with rats, biological activity in a solution diluted well past Avogadro's number (30C).

Finally, a holistic view of the patient is taken in the practice of homeopathy. The patient is thought of not in terms of their disease. The illness is not objectified, abstracted, and isolated from the patient. The patient is perceived as an individual who needs to be understood and appreciated with the entire picture brought into the clinical setting.

Let's take a moment to examine the literature on the subject of homeopathy. Dr. Jonas and his colleagues published a review of the literature in 1997 in the British medical journal, *The Lancet*.[1] They reviewed 89 published studies of homeopathy and ranked them according to a number of criteria including quality of study, stated double-blinding, and MEDLINE listing, among others. They then calculated the odds ratio that the outcomes reported could be due to chance alone versus a specific effect. The authors conclude with 95% confidence that every outcome was not due to chance alone. The authors also corrected for publication bias and developed a worst-case scenario. For these analyses, there is a 95% chance that the results are due to a homeopathic effect and not chance. In a subgroup analysis looking only at such things as high-potency preparations only or classical homeopathy and clinical homeopathy, the reported results appear not to be due to chance. Thus, based upon studies published in peer-reviewed scientific journals, there exists a specific homeopathic effect. This is particularly noteworthy considering the general feeling among most scientists that homeopathy has no basis in fact.

A recent example of a well done study appeared in the journal Cancer in 2001 by Dr. Menachem Oberbaum.[2] He studied the efficacy of Traumeel versus placebo for the treatment of oral pain. Traumeel is a commercially available homeopathic preparation consisting of a mixture of compounds of varying potencies (3X – 6X), Arnica Montana being the principal ingredient. Of the fifteen patients in the experimental group, 10 were completely relieved of oral pain compared to one patient in the placebo group. So we see that well done studies of homeopathy are beginning to be published in high quality journals and that, at least in this case, there is strong support for homeopathy.

A concept related to homeopathy is hormesis. With many compounds, as the dose increases so does the response. Likewise as the dose decreases the response decreases. Eventually a lower concentration is reached past which no response is seen. With compounds that demonstrate hormetic dose-response relationships, the response may increase even as the dose is decreased. With hormesis, toxic compounds may become protective; a fundamental concept in homeopathy.

Dr. Ed Calabrese recently convened a conference on what he called non-linear biology. A number of the presented papers were on radiation. It appears that small amounts of radiation may actually be beneficial. Although counter-intuitive, this phenomenon actually makes sense. A small amount of stress or trauma may actually be good for us. An example of this may be exercise. Running the marathon without preparation would be very destructive. But through gradual and continuously stressing ourselves through exercise we actually become healthier. This is an example where a large dose such as running a marathon is destructive while a small dose such as light exercise is actually good for you. This is the concept behind both hormesis and homeopathy.

Linde, Jonas and colleagues published a critical review and meta-analysis of homeopathy in 1994.[3] On the whole, the quality of studies using serially agitated dilutions (homeopathic preparations) is not very good. Most of the studies are not well controlled. Among the very best studies, the ones that are double-blinded and controlled, there is evidence of a homeopathic effect. For instance, in a study involving 7C, 9C, and 15C preparations of arsenic and mercury administered to rats, protection from further administration of these toxic compounds is demonstrated.

We currently have a Program on Neuroprotection at the Samueli Institute (www.siib.org). I will use this Program to illustrate our general approach to research into alternative medicine. We begin our studies by screening toxins in the cell and molecular biology laboratory to determine which toxins demonstrate hormetic or homeopathic protection. The toxins that are selected by screening are then tested in the brain injury lab for effect size. Using an animal model, tests are run to determine how effective the screened toxins are at protecting the animals from injury such as stroke. Once a robust model is developed, studies are begun to determine the mechanisms at work. This is the stage we are at currently, and it is perhaps the most difficult. Mechanisms for homeopathy have, to date, not been clearly demonstrated. Understanding mechanism will give us confidence to go forward with clinical trials.

As part of our Neuroprotection project we are exploring the impact of serially agitated dilutions of glutamate on neurotoxicity. Glutamate is a simple amino acid that is used by the brain as a neurotransmitter. Though glutamate is required for the normal function of the brain, too much is highly toxic to nerve cells. During stroke, the nerve cells that are starved for blood and oxygen release excess amounts of glutamate; no one knows why. The excess glutamate is toxic to the very cells that released it, resulting in cellular death which causes the devastating effects of stroke.

We have been exploring this phenomenon in tissue culture and in animal models. Excess glutamate added to a dish of growing nerve cells will cause them to die just like in a stroke. However, if the cells are pre-treated with extremely low concentrations of glutamate before the toxic dose of glutamate is given, some of the cells are protected by the pre-treatment and survive the toxic dose. Two aspects of this are note worthy. First, one of the calculated concentrations of serially agitated dilutions of glutamate that is most effective is 10^{-30} molar. This is important because at this calculated concentration there are no glutamate molecules present in the solution. All the known laws of physics and chemistry tell us that since there are no molecules present there can be no effect. Yet we see an effect. Second, when a graph is made of the amount of neuroprotection versus the calculated concentration of glutamate, a sinusoidal curve is produced. This has been seen by other labs looking at the impact of serially agitated dilutions on biological systems, most notably Dr. Benveniste's.

Using an established rat model we have tested a 30C (10^{-60} molar) solution for its ability to protect against stroke. When compared to control solutions, ultra low dose solutions of serially agitated glutamate decrease the amount of brain damage (stroke) by nearly 60%. The animals' neurological scores and EEGs also improve compared to controls. Thus, a homeopathic preparation of glutamate containing no molecular glutamate provides significant neuroprotection from stroke in an objective animal model. This is a very important finding and heretical to conventional western science.

Although these specific findings are new, others have studied ultra high dilutions in the biology laboratory. One of the more famous studies was done by Dr. Jacques Benveniste and his colleagues and reported in 1988 in the scientific journal *Nature*.[4] This is arguably one of the most controversial biological papers ever reported in this most prestigious journal. It has had repercussions for the entire study of homeopathy.

Briefly, Benveniste and colleagues challenged mast cells (cells of the immune system) with increasingly greater dilutions of the immunoglobulin molecule IgE. They found that mast cells degranulated (reacted) even when there was no possibility of any IgE present in the solution. There is no established scientific theory to explain this observation. And, in fact, this observation is so unexpected that many doubt its veracity. In spite of the existing dogma, the ability for serially agitated dilutions of non-ponderable concentrations of a variety of compounds has been shown to have effects on biological systems in the laboratory.

In a first for a scientific publication, Benveniste and his colleagues were required to have the experiment repeated in other laboratories *before* the journal *Nature* would publish the findings. The usual order is to publish the work and if there is scientific interest, *then* other laboratories attempt to replicate the study. In this case 4 of the 5 other groups were able to replicate Benveniste's original findings and so *Nature* published it, but not without an unprecedented accompanying note from the editors expressing their incredulity.

In addition to demonstrating biological activity with no active molecules in the solution, Benveniste's group observed another unexpected phenomenon that others, including us, have seen. Biological activity in the absence of active

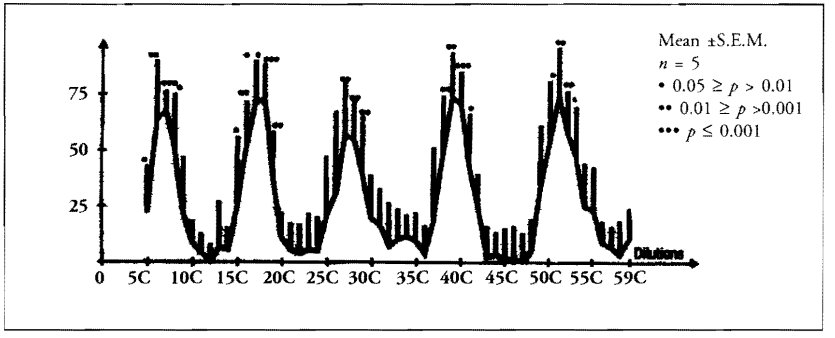

Figure 2. *Inhibition of basophil degranulation by histamine dilutions.*[5]

molecules nonetheless is dependent on the degree of dilution and agitation of the solutions. Continuing dilutions result in a cyclical or sinusoidal pattern of response. Thus, while 27C (10^{-54} molar) solutions causes significant degranulation, 28C causes less and 29C thru 32C each cause less degranulation than the proceeding concentration. Yet, 36C thru 39C each cause more degranulation then the proceeding concentration. Once the new peak is reached (39C), the cycle repeats with decreasing and then increasing once again (see Figure 2). The significance to this pattern is unknown.

Again, in an unprecedented move, the journal *Nature* asked and received permission from Professor Benveniste to send an investigative team into his laboratories. The team, which included Randy the Magician and the then chief editor of *Nature*, "invalidated" Benveniste's original findings. There remains considerable controversy surrounding *Nature*'s investigative team's methods and findings. Nonetheless, homeopathy was negatively impacted by the incident, and to this day homeopathic research in France is rarely done. Evidently, attacking an existing paradigm can have dire consequences.

In 2001, Professor Madeleine Ennis of Queen's University in Belfast published a study in the journal *Inflammation Research* titled "Flow-Cytometric Analysis of Basophil Activation: Inhibition by Histamine at Conventional and Homeopathic Concentrations."[6] She applied the latest methodologies to the basophil experiment using homeopathic preparations of histamine. To her surprise, even at extremely low homeopathic concentrations, histamine inhibited basophil activation. While not identical to Benveniste's study, it confirmed

that homeopathic preparations with no active molecules still retain biological activity.

Professor Benveniste believes that the biological activity remaining in homeopathic preparations is in the form of an electromagnetic (EM) signal. Further, that this electromagnetic signal retains the biological activity of the original compound. His claim is that somehow water stores the original biological activity in the form of an electromagnetic signature. He concludes that because electromagnetism is the mechanism underlying homeopathic preparations, it is possible to store a homeopathic preparation digitally. Therefore it would be possible to transmit the essence of a homeopathic preparation over the Internet.

This is not as improbable as one might think; after all, biological molecules are known to vibrate between 5 Hz and 20 kHz. This is the frequency range within which Benveniste claims homeopathic signals occur. Interestingly this is also the frequency of human speech. In fact the apparatus developed by Benveniste to demonstrate this phenomenon employs a typical computer sound card to transmit the digital signal to naive solutions.

Briefly, the process is to first capture the EM signal from a biologically active solution and store this digitized signal on a computer's hard drive. The EM signal is then "played back" through a sound card to a conventionally wound copper wire coil. Sound is not produced; the sound card's output is used as the input for the coil. The solution being treated is placed within the coil and exposed to the resulting oscillating magnetic waves (5 – 20,000 Hz). In this way, according to Benveniste, the solution in the coil will behave as if the original molecules had been added to the solution. Although Benveniste believes that EM signals are the basis of homeopathic preparations, he does not use extremely low homeopathic concentrations to generate the source EM signal.

Now, for a little basic biology; there is a complex series of molecular interactions during blood coagulation. Two of the molecules are thrombin and fibrinogen. These two can interact alone in water without any of the other players normally found in the formation of a clot. Because there are no blood cells in a pure thrombin–fibrinogen reaction, the clot is not red. At room temperature and within a few minutes, a clear clot will form.

Professor Benveniste used this simplified system to test his theory. By using very dilute thrombin and fibrinogen in water and mixing them together precisely, the coagulation event can take upwards of an hour. Also, using this system with a small amount of thrombin inhibitor, heparin, for example, the thrombin–fibrinogen reaction can be delayed or even blocked entirely. Benveniste has recorded the "digital" signal for a thrombin inhibitor and "plays" it back to the thrombin solution. When this "informed" thrombin is then mixed with fibrinogen, Benveniste claims that the thrombin–fibrinogen reaction is inhibited just as if the actual molecular thrombin inhibitor were present in the mixture.

We attempted an independent replication of these ideas in our laboratories using the same equipment Professor Benveniste uses. We purchased the equipment from Benveniste's company, DigiBio, and hired him and his coworkers as consultants. They came to our laboratories to set up the equipment we had purchased and showed us how to do the experiments.

The experimental design consisted of three conditions each repeated twice. The order of the conditions and their repetitions was randomized; the randomization being controlled by a computer while the operator remained blind (ignorant) to the order of conditions until after the trial and data gathering was completed. We had multiple operators run the apparatus to be sure that any positive results would be operator independent. Finally, we ran a series of pilot experiments to be sure we had sufficient statistical power to be confident of our outcome.

The three conditions refer to the signal being played for 10 minutes from the computer sound card through the coil. A fresh vial of thrombin was placed by robot within the coil at each playing. Digital thrombin inhibitor (DTI) was one of the signal conditions. Plain water (WAT) was another and the third condition was no signal at all (NS). For this last condition, the fresh vial of thrombin was placed within the coil for 10 minutes, but no signal was transmitted from the sound card. The digital signals were standard Microsoft sound files (*.wav) of 3 second duration played in a repeating loop for 10 minutes. As mentioned above, the order in which they were played was determined by the computer in a random manner. During a single trial, each signal was repeated twice for 10 minutes each time. The sequence of repetition was also random and controlled by the computer.

The principal hypothesis tested was whether the reaction rate for coagulation between thrombin and fibrinogen was dependent on the signal being played through the coil. Specifically, would the DTI signal result in a slower reaction rate compared to the WAT signal, while the rate of reaction remained the same for both the WAT and NS signal. Independent replications supporting this hypothesis would be considered support of Benveniste's claims. On the other hand, if there was no difference among signal conditions, then there was no digital effect. Or, if there was a difference among all three conditions, then there was a non-specific digital effect.

Our role as experimenters was reduced to placing the starting solutions of thrombin and fibrinogen in storage wells and distributing pipette tips and dishes into the receptacles. A robot developed and built by Benveniste's company DigiBio performed all the actual mixing and distribution of solutions into appropriate places at appropriate times. The computer determined the times and placement as well as the signals played, their duration, and the order in which they were played. This helped remove the unintentional influence of investigator bias and technique. Finally, we repeated the experiments often enough to provide sufficient statistical power to test the hypothesis.

The experiments were separated into three consecutive phases. The first was the pre-pilot phase. During this phase Benveniste's team came to our laboratory as consultants, set up the robot, and showed us how they normally do the experiments. During the next phase called the pilot phase, Benveniste's team ran the experiments and collected the data. This was to confirm that they had set the apparatus up correctly and could replicate the results they were getting in their laboratories in France. In the final phase, the test phase, Benveniste's team returned to France and no longer had any direct interaction with the experiments or the apparatus. During this phase only our researchers performed the experiments. By restricting Benveniste and his team to the role of consultants we were able to assure an independent and unbiased effort on our part.

Using a robot and computer (without playing digital signals) to perform the experiments provided us with a high degree of reproducibility. The results from these pre-pilot experiments were so consistent that statistical analysis indicated four experiments would be sufficient to detect a 20% variation from

the norm. Of course this is not a surprise; the biochemical reactions between thrombin and fibrinogen are well understood and experiments run by a robot should be virtually the same from run to run. We moved to the next phase with a high degree of confidence in our ability to detect any digital effects.

The next phase was the pilot phase. During this phase Benveniste's team were present and ran the experiments using the robot. They performed twenty-one experiments, each consisting of the three conditions in duplicate. A twenty-one to twenty-eight percent inhibition by digital thrombin (DTI) was observed compared to the water signal (WAT) or the no-signal (NS) condition. Statistical analysis indicates that the results are highly significant ($P > 0.0001$). The digital signal appeared to work!

Interestingly, the digital signal only worked when Jamal, one member of Benveniste's team operated the robot. In the next phase, the test phase, we ran twenty-two experiments without Benveniste's team involved. During the test phase, four different investigators operated the apparatus. No digital effect was seen in any of these twenty-two experiments.

The Defense Advanced Research Projects Agency (DARPA) had supplied the funding to attempt the replication of Benveniste's claims. When it turned out that we were unable to replicate his results, except in the presence of Jamal, they lost interest in the project. DARPA had been interested because of the implications of a machine capable of digitally capturing, transmitting, and reconstituting biological activity. We were unable to demonstrate an effect using the machine alone.

So, our conclusion is that the machine by itself is not capable of producing a digital biology effect. The focus is now on operator effects since we only saw an effect when Jamal was present and operating the apparatus. Jamal smokes cigarettes, although never in the laboratory. Perhaps this had some influence on the outcome.

We have moved the apparatus to another laboratory and are experimenting with Bill Tiller's IIEDs to see if they will influence the outcome in a manner similar to Jamal. Although we tried one experiment with Mietek Wirkus near the robot and saw no effect, we may try that experiment again.

We hope to eliminate the prosaic possibility of systematic errors by filming and closely watching operator interactions with the machine. We intend to explore the possibility of unique chemical discharges from particular individuals by placing shields with various characteristics between operators that affect the outcome and the robot.

Is this an example of direct human interaction with a machine, a form of human "bioenergy"? We don't know but it remains an intriguing possibility.

Thank you for your attention. I would like to leave you with a quote from Daniel J. Boorstin.

> The greatest obstacle to discovery is not ignorance, but the illusion of knowledge.

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QUESTION AND ANSWER

Attendee 1. Thank you for a fascinating presentation. It always amazes me how much work science has to do to prove what mystics, and shamans have known for forty thousand years. And I also am an independent practitioner in energy work, and I do have a scientific background. And there is much I could comment on, or question. But what really struck me was your graphs, showing what you called rhythmicity, and that also Dr. Gibson who spoke earlier that showed a graph rhythmicity. And as a

practitioner I see rhythmicity in the healing response of the client, and I see a lot of heads nodding, I'm sure you see this. You do an energy treatment, and this is commonly true with chronic conditions. The condition goes away, the client feels better, time passes and the condition comes back. You do another energy treatment, and this goes up and down, there's like a jagged pattern of recovery. And in my own experience where I've treated myself for chronic fatigue syndrome for like fifteen years, I've certainly had this jagged pattern, but over time the jaggedness evens out and the health, the level of recovery, improves and stabilizes. Now I'm talking fifteen years in my case. So what I'm suggesting is that we need long-term studies of these clinical responses and to pay attention to this jagged pattern, from the scientific end. From the practice end, this is not well understood. People come they think they are going to get a treatment, they are going to get a miracle cure, I'll never be bothered with this chronic condition again. It comes back. There's judgment, there's negativity, there's discouragement. And we need to suspend that judgment. And like you say, nature is trying to tell us something that we don't understand at this point.

John. *Thank you very much.*

Attendee 2. Hello I am a practicing homeopath, and many of us in the community have waited for the time when pure science would be able to validate homeopathy. And we feel that all the clinical trials you could do, would be shot down, and it is only going to be with really objective science that we are going to get to that point. And what you are expressing, explaining here, were at that threshold. And I think it's going to really revolutionize science, not to mention homeopathy. But a couple of things. The succussive method is a really interesting one in homeopathy in terms of the quality of succussion in order to make a remedy. And many pharmacies have really looked at this area, and I have a really good friend who has a pharmacy in England, and he has a room, and we have two stools in the room. And you sit on one stool and the other stool has a huge volume, a leather bound volume of King James, the second bible. And the remedy is succussed like this in the room. You know, just with that, with the intention, and it's your intention in the way you make the remedy by hand, that creates the quality of succussion and potentization. More than you can get with the best machine that replicates that method. The way you described it with the pipette shooting in there is a method used, ironically by French pharmacies. But other pharmacies, Indian pharmacies for example, which I've looked at, being in India and in England and in America the machine is made, which thumps directly onto a hard piece of material, that creates a specific succussion, more than mere shaking. And the shaking is not the same as that actual thing. And that affects the dynamic potency, or the wavelength of the remedy in which your making. And the theory is that will create a more potent remedy. And anyway that is another interesting part of research, in terms of a potentized substance. And I suppose finally

now, I wonder, will homeopathy be accepted, or shall I expect a visit from the DOD and the FEDS. Especially in these bioterrism days we live in, I could be a threat to American security.

John. *I have two things to say. One about the succussion and one about homeopathy. We have just finished writing a proposal to the Department of Defense in which we substituted the word hormesis for the word homeopathy. But, it is in fact a homeopathic study for developing chem-bio-warfare antidotes. They are extremely interested in that.*

Attendee 2. One thing, it is verifiably proven, and documented, that a homeopathic preparation of the small pox virus was used and clinically verified in the nineteenth century to prevent the occurrence of small pox. This is documented in all homeopathic literature; it is called veriolionen and it is a very well used remedy for a lot of post small pox conditions. We use it when anyone has had small pox. It was verified clinically to prevent people getting small pox or getting very fatal instances of small pox.

John. *Could get that reference from you?*

Attendee 2. I will get it to you, it's very interesting in this area of specific, as opposed to a general immune response. A specific immune response to a specific antidote. And we also found out that using the remedy in water as apposed to pills can sometimes have a different effect on the system. And many homeopaths now experiment giving the remedy in solution again.

John. *Yes we have also found that to be efficacious. With regards to succussion, I succuss on my knee. I have tried using books however, I have never tried the Bible. But I have used books as a surface to succuss on. I find that I break the glass tubes more often using a book to succuss against as opposed to my knee. I get this interesting effect, I don't know if anybody else has done this, and I've never known whether it is just me talking to myself or whether it is real. But, every once in a while the water in some of the tubes, not all, feels different. It behaves as a unit, normally it is a splash, splash. Ever once in a while it is as if it were this object moving back and forth as a single piece. And once the tube does that, the whole tube stays like that. It will disappear for the next couple of dilutions and then come back. I tried having a skeptical researcher, he happens to be a Captain in the Army, do the succussion. And he did it on his knee and the homeopathic effect in experiments seems diminished. That is the only time I've had the potency apparently disappear. There may be some real entanglement, whatever that really means, between the person doing the preparation and resulting cure.*

James Oschman. There is an effect called the polly effect named after Wolfgang Polly, who received the Noble Prize for the polly exclusion principle. Polly was a brilliant

theorist and a disaster in the laboratory. Such that people dreaded his coming into the laboratory because their experiments would stop working, or apparatus would break and I have also demonstrated this effect. My wife thinks I spend to much time on the computer. When she comes in the room, when I'm working on the computer it crashes. This is a repeatable phenomenon.

John. *Jim, I have seen the same phenomenon. I was trained as an electrophysiologist, and my mentor put a note on the door, "John, if you are upset do not come in this lab." The devices we used measure very small currents from cells, so they are very sensitive; you can pick up your heartbeat ten feet away. So you are supposed to put a grounding strip around your wrist to null out your heartbeat. They had a wire running out of the room to ground me out because all I had to do was get in the room and the effects were picked up. I don't seem to show any other "mystical effects." The Benveniste machine is a good example. When his crew was over and I'd become upset about something completely independent in another room, I walked into the room and every device shut down. I said "sorry" and walked out, they turned everything back on, I calmed down and walked back in. I agree with Jim, this is an odd machine human interaction, which I have no ability to explain as a scientist. Certainly my advisor is a skeptic of the highest order, nonetheless he put the sign on the door, "John, if you are upset do not come in this lab."*

Karl Maret. John I want to compliment you and Wayne for redoing this work. I cannot but suspect that some of that was there [person effect] and I think Jacques actually did to some degree too. A couple of questions. The first thing I was very interested in was the Mu Effect, of being blocked by Mu metal. And I believe the original machine that Jacques showed me, just had a strong Iron casing around it, but not Mu metal. Has it ever been done with Mu metal around the whole machine so that the Jamal effect may be blocked?

John. *That was their first hint. The machine that we ordered and that we thought we were going to get, was a shielded, a Mu metal shielded machine. They discovered that with everything they put in the Mu metal the effect decayed over a few days. With the shield on, the effect decayed over a few days, and that was his first hint that there was an operator effect. So the answer is yes it has been tried and every time you do it the effect goes away.*

Karl. Ok, so that also brings in what level of the electromagnetic interaction takes place. It isn't obviously a subtle energy effect or a subtle intentional effect.

John. *It appears to be magnetic.*

Karl. Right, then the next question is, to what degree is there a resonance set up with intention, in the same way as Bill Tiller is starting to see in a conditioned space. Have you looked at that at all?

John. *Well, maybe I didn't make it clear. We have moved the machine to a new space. We left the machine boxed and started doing Tiller's initial experiments to ascertain what the space's condition is by measuring pH and temperature. In the first few days there appears to be no condition. We have no IIED device. This is supposed to be background. Within a few days though, we start to see anomalous behavior between the PH and temperature. Bill is telling us that that's occurring in every one of his sites. He's having a difficult time finding an unconditioned space. So that being the situation we went ahead and unboxed the device, set it up and there's no effect. That is, the results of every run under every condition look identical. Now interestingly enough, for the first couple of days the robot refused to work properly. It did weird mixtures and dropped things, and all kind of weird stuff was going on. So, I don't know what that means, but I went in there for a few days, and basically just sat with it and talked to it, and rewired it, and unplugged it and plugged it back in, and it started behaving normally; that is, no effect. So we're running this machine, we're going to run it probably for four weeks and we've started putting together the statement, and Bill is going to have the statement entrained into an IIED and we're going to try it and see if it will have an effect.*

Karl. And if I may just make one other comment. It might be very useful to do some of the ultraviolet spectroscopy work that was done by Dr. Lutwig to look at the water before you start just to see how electropolluted the water might be. Or to get at best a quality of water, so you can start with, you know a clean sample. And also to point out, or maybe elicit your comment about the work Germer or somebody like with that name that had started to find that when they started diluting things that actually that things didn't disappear but new structures were formed. You know that work right, that's just being done in Korea.

John. *Karl, I took careful notes from your discussion yesterday and that appeals to me very much. We have sent up my potentized preparations of glutamate to the MIT labs and had NMR's done on them and um, I don't want to take to much of your time, it's an interesting story. I sent it up as blinded samples: X, Y, and Z. KCL, Glutamate and water, but they were totally blinded. They put the samples in the NMR and wrote me a few days later and said were sorry, our machine is broken. Were getting this spurious signal, so you may have to send us a new solution, but we've kept it around, were rebuilding the head. I said fine, I'm a little short on solution, but see if you can't use it. "Do we have to store it specially?" they asked. I said I don't think so, it got shipped through the mail. I don't expect you to see anything anyways. They wrote back a few days later, and said we've called in the manufacturer, because clearly there's something wrong with our machine. Every time we put in one of your samples we get this spurious signal. So, the manufacturer comes out and rebuilds the machine, says there's nothing wrong with this machine. Well they've taken a look at it. I've unblinded them. My glutamate preparations has two peaks that have heretofor not been seen, and they are unexplained. It appears*

as if water were existing in new structure. I don't know what to do with this and it's a very small peak compared to the water peak which is gigantic but this is, if you will, state of the art machine technology seeing something that everybody, and I'm no expert in this field, tells me they had not seen before. And they only see it in my 30C glutamate preparation. My 15CKCL does not produce it nor does the water. What do we do with that? Chase it I hope.

[Note written by John Ives, December 2002: It turns out that the spurious signal we saw with glutamate preparations was due to a contaminant added during the preparation of samples for the NMR. Such is the nature of science. Frequently when you think you have something new it turns out to be artifact.]

Carol Schneider. John we're going to be talking this afternoon about intention and other things involving experiments with healers. But before I sort of forget how my mind was going with this, to say that what you may be looking at is the effect of the healer. The physiology of the healer. People have studied the brains of the healer in certain states and the healer's brain is different. Ed Wilson has studied several healers, Steve Fahrion has studied Mietek. We know that that exists in the healer. Assuming that Jamal has got the healing physiology, even though he doesn't want to use it since it is not scientific. He can't deny his biology. He can deny using his biology, but his biology probably has it. In the presence then of the intention that the machine would work. You see he had the intention that the machine would work. Mietek was in the room with his biology, but you blinded him to the purpose. You have no idea if he had the intention that the machine would work, it might well work, because he has to add the intention. Now I owe Margaret for telling me about the intention of the healer, she taught me that many years ago, and that's one of the reasons that we'll be talking about it this afternoon. I'll tell how she taught it to me, but basically then Benveniste obviously had the intention that the machine would work when he was with his machine, it was very important to him, but he didn't have the biology of a healer. So you missed a condition, mainly having Mietek with his biology and the intention. You could do that again.

John. *I agree with you entirely and that's where we are at.*

Attendee 3. Are you familiar with a couple of books from Japan on messages from water?

John. *I've not read them, but I've actually had them sent to me, so they are sitting on my desk.*

Attendee 3. The pictures are incredible in terms of internationality and toxins.

John. *Are you talking about the crystal formation in water? Yes.*

Attendee 3. I have tried to get information about the reliability and the validity of even researching water that way. I think it's incredible. I think if we could do that we could have large groups of people praying over toxins. I'm from Montana, and we've got the pits there. I mean there are so many implications. I was interested to know whether you've explored that at all or have any recommendations or comments about that technology for analyzing water.

John. *My first comment is "so many questions, so little time." So at the Institute we have tried to stay focused on things that we have a handle on, especially the ones from which we get results. So as you'll see this afternoon we are working very closely with Mietek. We get highly reproducible results and although the Jamal question is one I would love to pursue. I have one of the most gifted healer's on the planet down the street from me (Mietek), and that's where we'll stay focused. I don't have any kind of professional evaluation of the Japanese work, as I said I've just seen it, I thumbed through it, I saw these gorgeous pictures. Strikes me as absolutely fascinating. We won't be pursuing it at this time because we just don't have enough money and time. I think it would be worth doing though. I see time is up. I'll be around this afternoon and I'll be happy to answer other questions. Thank you.*

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