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SENSRI: A New Science Integrating Humanity and the Environment

Our mission is to promote research, education and the exchange of ideas growing out of science based on human perception and experience. By developing new and deeper capacities of sensing and thinking we create a scientific understanding resulting in creative environmental technology, in harmony with nature, meeting human needs.

See Our New Web Site! SENSRI recently completed the first phase of creating our Internet presence. On our web site you will find overviews of our programs, course descriptions, research summaries, published articles and books, people, announcements about upcoming events, and more. Please visit us on-line to learn more @ www.sensri.org

Celebrating Seven Years of SENSRI

On a recent evening in November, about 40 friends and acquaintances gathered at the Union Gables B&B in Saratoga Springs to celebrate SENSRI's seventh anniversary. It was a wonderful evening, generating a warm mood of celebration, radiating enthusiasm for the importance of SENSRI's work. After some conversation, hors d'oeuvres and refreshments, New Board member Stephan Doyon introduced the rest of SENSRI's Board of Trustees, and then invited Principal Researchers Tim Scherbatskoy and Michael D'Aleo to speak about the history and future of SENSRI. After Tim recounted some of SENSRI's past and current activities, Michael offered the following thoughts about our future.

The New Environmental Aesthetic

It is hard to pick up a newspaper these days without coming across a headline story speaking about the precarious state of our environment. Issues such as global climate change, peak oil, genetic engineering, suburban sprawl, bird flu virus and a host of others catch our attention, and become eclipsed by ever new concerns. It is often the case that continued scrutiny of these problems reveals that many of them have very different dimensions than initially described, while the solutions proposed for the problem *du jour* often turn out to be less of a solution than what was needed, or even become new environmental problems.

Recently, I found myself driving northward on the highway asking myself - where is all the environmental destruction that is supposed to be all around us? At that moment, I passed a broad, newly opened and cleared field

that was obviously being prepared for a large building project, perhaps a new shopping mall or warehouse. Immediately I felt a sinking feeling as I imagined yet another shopping plaza similar to the many that have sprung up in that area over the past decade. Unexpectedly, this thought was quickly replaced with the imagination of a grand European cathedral I had been in a few years ago. Within a few moments, this image transformed into an old Zen temple and garden I had visited in Osaka, Japan many years earlier. These images filled me with a very different feeling, one of hope and inspiration. I then realized that it is not so much the loss of the field that pains us, but it is what might replace the natural landscape that we feel so uncertain about!

The core issue here is about the loss we feel in the replacement of one set of phenomenal impressions with another set of impressions that are less inviting. Often, we lose nature and get a "big box" in its place. This can also happen on more subtle levels. For example, we have lost our time for peace and quiet, and replaced it with the ability to contact anyone, anywhere, anytime by cell phone. Note that there are few objections, if any, to replacing a field or forest with a beautiful building or a lovely public park. When we transform industrial or urban blight into spaces that enrich human experience, such as gardens or parks, we also have very positive feelings toward this change. Again, it isn't so much the loss of a natural landscape that is the problem, it is its replacement by something that reduces the quality of our environmental experience, that trades nature for maximized retail space, that takes away our connection to the natural world. This is what all too often leaves us feeling alienated.

Avoiding the undesirable tradeoffs of human advancement, however, does not mean that our only choices are to go back to “living in the stone age” (the Flintstones) or to create a futuristic “high tech world” (the Jetsons). And we don’t have to end up creating the perceptions of a totally artificial reality like the Matrix, either. We *can* live in a sustainable, harmonious relationship with our present changing world. But to do so, we need new approaches to the technologies involved in environmental issues. We must build on the successes of the early environmental movement, more carefully examine the inherent wisdom of nature, and build a future based on a *new environmental aesthetic*. What we should be seeking is not a future in which the ends justify the means, but instead a future where every means to an end is one that can be justified.



This new way of being on earth requires development of what we refer to as the *New Environmental Aesthetic*. This work has three central themes:

1) We must recognize that the world “out there” - the world that we think of as simply *given* - is greatly dependent on our habitual modes of thinking and perceiving. The relationship between what we think of as “the world” and “our self” needs to be consciously developed and experienced for how it actually manifests. Careful examination of how meaning arises shows that the *intentions* we bring to our experiences affect what and how we perceive. By recognizing this activity we become more sensitive to the *world as interaction* rather than as simply self and objects. SENSRI’s focus on *the nature of knowing* is a means for developing practical, integrative approaches that reconcile the current self/world split.

2) We currently have a science of objects; what is also needed is a science focusing on *activity*. Our present science is almost totally built on the interaction of material objects. Mechanics and material science play the central role in science today, and this strongly defines our present world-view. In this world-view, almost all phenomena are seen as originating from

material causes. How can we begin to see the world as *interactions or activities* coming into and out of appearance? When we experience the more subtle impressions of the world, new relationships are discovered that lead to more integrative understanding and awareness of our world. SENSRI’s research into more subtle modes of perceiving dynamic phenomena such as moving water works toward this end.

3) We need to develop technology and machines that don’t create one specific outcome at the price of overwhelming our other senses or nature, but instead enhance our opportunities for rich sense impressions. One of the motivations for developing machinery was to take away the drudgery of repetitive tasks so people could have more time to enjoy life, to experience the world. Unfortunately, some of these machines also create conditions in which we are less interested in participating in the world, in which we are encouraged to “tune out” our senses. The auditory qualities of a leaf blower come to mind. SENSRI is working to create new approaches to technologies that enhance our experiences, rather than creating situations where we “tune out” and turn inward, increasing the separation of self and world.

The human being is a creative being. Art, music, and engineering are human activities in which we strive to create conditions of being that do not exist in the natural world. When these arts are well carried out, that which was created outside of the natural world is transformed into something beautiful. A new experience is created that enhances some aspect of the natural world or creates something new. This is the goal of the *New Environmental Aesthetic*: the creation of environments and conditions through the creativity of human being - in harmony with nature - where our results enhance sensory impressions. This is the difference we experience between the old cathedral or temple and the new “big box”.



To achieve this will require a new generation of scientists and new ways of working. New educational opportunities will be needed. SENSRI has already

developed programs for high school students, and has been helping educate the next generation of teachers through programs such as Teaching Sensible Science (editor's note: this program is described elsewhere in this newsletter). What is also needed is to help educate the next generation of researchers and engineers. Toward this end, SENSRI is developing a center for Integrative Science, which includes a graduate degree program focused on developing and practicing the skills needed for human beings to re-imagine and transform the world we co-create. Studies in Integrative Science will focus on the three themes previously described:

- Deep investigation into how the way we think informs our relationship to the world/self experience.
- Development of more conscious, attentive, subtle skills of perception of phenomena of the natural world.
- Creation of technology whereby human beings can work in a more harmonious yet creative manner with the designs and activities of nature.

Creators of this new technology will need to synthesize the *consciousness of the philosopher* with the *subtle perceptive abilities of the artist* and the *rigorous understanding of the scientist*. This synthesis will form the seed for the creation of the *New Environmental Aesthetic*.

SENSRI Research

Research at SENSRI is based on understanding the relationship between human perception and experience in a way that leads to concepts and actions that are in harmony with the intrinsic designs of nature. This consciousness is at the heart of our phenomenological and scientific work. Our research addresses environmental issues that need fundamentally new approaches that bring human activities into line with a new sensitivity and consciousness of being on earth. Our approach is rooted in traditional scientific wisdom, yet is highly attentive to conscious perception in the present moment, and leads us into a more sustainable coexistence and awareness of the natural world. Brief descriptions of major research areas are given here; more information is available on request or on our web site.

Activity of Living Water: To develop our understanding of how the more subtle activities of water shape its behavior and influences, we are examining the movements of water in highly active natural systems: in artesian springs in the earth, in sap in plants, and in blood in animals. By looking at these phenomena with an eye toward the role of dissolved solutes and gasses, we seek to penetrate some of the mysteries of their movements, which have challenged science for over a century and remain inadequately explained to this day. Research on the activities of the mineral springs of Saratoga Springs is one

of these areas, and is reported on later in this newsletter.

Dynamic Forces in Water: One of the goals of this research is to develop observational techniques for perceiving the activities and patterns of flowing water and to characterize water's dynamic qualities. By examining the responses of water as movement, this research also seeks to identify subtle but powerful transformations water can experience. Laboratory studies are ultimately aimed at developing practical water technologies that will alleviate some of the world's pressing environmental problems, including water purification and desalination. These projects have been funded in part by a grant from the Nordlys Foundation.



Metals and Mineral: Metals such as silver and gold, long recognized for their beauty, have significant activities and qualities related to health and vitality. Certain clays have also been known to have healthful properties, yet the basis for these health-giving activities has not been fully understood. Through phenomenological scientific investigations of these substances, combined with clinical and agricultural observations, we are characterizing the nature of their activity in a number of practical applications.

Education: Three distinct programs have been developed. *Teaching Sensible Science* is a part-time course offered during the school year to help teachers develop an understanding and experience of phenomena-based science. Course work consists of classes on the foundations of a phenomenological science, artistic work including drawing and movement, and discussions to review each day's work. The intention of this course is to give teachers a living connection to science such that enthusiasm, understanding, and interest can be shared in the classroom. This course is designed for practicing Waldorf grade school teachers, although other interested teachers are encouraged to inquire as well. *One World* is a week-long retreat set in pristine environments, such as the

Adirondack Mountains, where unmediated experiences of nature are possible. The goal of the *One World* program is to combine development of perceptual awareness with a deeper experience of the relationship between self and world, integrating “inner” and “outer” experiences into one world. Finally, *Integrative Science* is a new graduate level program being created to meet the needs of tomorrow’s integrative scientists, educators, and other professionals seeking advanced education in consciousness. Taken as an intensive one-year program or part time as a sequence of one-month modules, this program will include training in phenomenological science, environmental studies, and philosophies of knowing. Courses will be taught at SENSRI’s residential retreat center in the heart of the Adirondack Mountains in upstate New York, and possibly in the mountains of northern India near Dharamsala.

Activity of Artesian Springs in Spa State Park

We have been interested in understanding the activities of water in a number of systems, including plants, animals and the earth. Although explanations for the movements of these fluids exist, close examination of their details reveals that many important questions remain. In fact, no one fully understands how water in some springs, such as those in Saratoga Springs, appear to work against gravity to bring water to the surface. Explanations generally involve hydrostatic pressure induced by gravitational flow from uplands, but these lack sufficient detail to account for variations in flow rate, chemistry, flavor and other observable qualities of the springs’ waters. Since April 2005, SENSRI researchers have been sampling the waters of three springs in Spa State Park, Saratoga Springs, NY studying variations in their characteristics and relating these to various possible environmental influences.

Our study focuses on three artesian, naturally flowing springs located within 150 meters of each other – Polaris, Hayes, and Island Spouter. Our goals were to sample and observe the qualities of these waters and relate them to variations in environmental factors such as weather, season, and position of astronomical bodies such as the moon. We are also interested in reviewing historical information about them to determine if previous research noted patterns of variations in their chemistry or other qualities. Our research hypothesis is that the character of the water and flow of these springs is influenced by environmental variations, including earth forces, air pressure and temperature, precipitation patterns, and lunar and planetary movements.

Springs were visited at least monthly, although on occasion we conducted repeated measurements over the course of a day or days. At each spring we measured temperature, conductivity, pH, clarity, taste, odor, flow rate, and gas volume, as well as current weather and

astronomical conditions. Since April 2005, we have sampled each of these springs about 20 times. Intensive sampling occurred around dates of significant astronomical events such as eclipses.



Detailed analysis of patterns and correlations will not be completed until we have substantially more data. Our emphasis thus far has been on developing our methods and quality assurance procedures, on simple visual examination of the data characteristics, and on improving our abilities to discern the qualities of the water. Developing consistent sensitivity to qualitative aspects such as taste and odor is an important and challenging component of our work.

It is interesting to note some similarities and differences among these three springs. For example, Polaris has the lowest conductivity, gas volume and pH. The other springs, located near each other on the banks of Geyser Creek, show similar characteristics to each other. Although Polaris is lowest in gas volume, it is more carbonated than Hayes, both in taste and visually; tiny bubbles form and grow on the inside of a glass of Polaris water, while bubbles are completely absent from water from Hayes. Both are crystal clear. Polaris has pleasant, mild tasting, carbonated water, and a reputation for high radioactivity. Hayes is notable for its strong, unpleasantly salty, metallic taste, and its historical therapeutic reputation.

What is most interesting to us is the process by which these springs carry water up to the surface. Although free-flowing springs are generally considered “artesian” and driven by gravitational subterranean flows, this process is poorly understood. Furthermore, these are carbonated springs, with large amounts of carbon dioxide dissolved in their water and accompanying their flow. We are interested in understanding the role of carbon dioxide, and will continue to study this and other aspects of the springs’ characteristics during the next year. From this research, it is our goal to learn more about the sometimes hidden intrinsic forces and activities of these “living waters.”

Teaching Sensible Science

What is the nature of our sensory impressions and what are the resulting relationships by which we develop an understanding of the world and of ourselves? These questions lie at the heart of comprehending a phenomenological approach to science, which is explored in depth in this course for Waldorf middle school teachers.

This course was envisioned two years ago by Michael D'Aleo, SENSRI researcher; high school science teacher at the Waldorf School of Saratoga Springs; and co-author of the book *Sensible Physics Teaching*. It was first taught in 2005-06, with a second cycle in 2006-07, and additional cycles planned for future years. *Teaching Sensible Science* is sponsored by the Research Institute for Waldorf Education, SENSRI, and the Waldorf School of Saratoga Springs. Excerpted here from an article by Gary Banks are brief descriptions and photographs from the first session of the course, from 2005-06.

Mornings were organized around discussions of epistemological questions led by Michael D'Aleo. These sessions covered a broad scope of topics, ranging from the nature of sense experience and how we form concepts about our experiences, to the roots of materialism. The intention of the morning sessions was to ensure that the course participants developed a clear understanding of the distinction and rightful role of sensory impressions (observations) and conceptual relationships, as the foundation for understanding any scientific experiment or everyday experience.



The afternoon sessions were spent exploring the experiments that form the heart of the middle school curriculum. Each week was formed around the physics curriculum of a particular grade, starting with grade six. The second week also saw the addition of the chemistry curriculum of grade seven, led by Gary in evening sessions.

To give participants more confidence in living into the phenomenological approach, they were invited to prepare

experiments, present them, and lead discussions. In teacher training and in our faculties, we often don't take the time to do such model teaching, and we can feel intimidated by the prospect of making a mistake or being unclear in front of our peers. Michael helped put us at ease when he reminded us, "This is your cheapest opportunity in which to make a mistake."



During the second week, we recreated and discussed many of the most challenging experiments of grade seven physics and chemistry curricula, including the lime kiln, the *camera obscura*, and the Voltaic pile. The long experiment sessions and hands-on approach allowed the participants to become more confident with practical aspects of teaching science phenomenologically.

Throughout this week, we noted how the discussions flowed much more easily and how all participants became more versed in avoiding misleading language and conceptual traps. Sometimes waking up to our habituated modes of living into concepts instead of experiences takes a bit of a shock. At several key moments in our experiment discussions, participants kept repeating what they thought should have happened or gave their concepts from previous experiences. In leading the discussion, Gary kept dramatically repeating, "It doesn't matter what you think happened or what you think should have happened. What was your experience?!" Experience is equally available to all people who have the sense organs to perceive, and a sense-based approach makes concept forming accessible.

As part of our study of the many characteristics and activities of water, we took a field trip into the Adirondack Mountains. We hiked to the base of a waterfall on a clear mountain stream where we observed the patterns and currents in the water. On reviewing our experiences, we came to see that observing water could become a metaphor for moving into the middle school, where mobility and change are constant themes. One participant's response to this work was a short poem that

seemed to capture both the artistic beauty and our conscious awareness of the sense-perceptible activity of the water in the mountain stream:

*A pool in sight
Just water and light,
Swirling, whirling,
The present unfurling.*



At the close of this course, Michael left us with a wonderful question to ponder as teachers:

Like water, do we have the mobility to go anywhere without being pushed anywhere?

One World – A New Approach to Being on Earth

Like many, you may have a strong desire to create a better environmental situation in the world, a more harmonious culture. You may also have a passion for understanding and digging deeper into your own relationship to the world. By world, we mean both its inner and outer aspects, that boundary where we find our self and the world simultaneously, intertwined, and sometimes inseparable. While we usually think in terms of two worlds, the inner and outer, at times each of us has had the experience that, in fact, these two worlds are not separated. In fact, it actually is One World.

Beginning with this simple statement, it is our belief and experience that a new approach to environmentalism and human understanding is possible. Our present environmental and societal challenges are the direct result of a world-view that is fixed and inflexible. As pointed out elsewhere in this issue (see The New Environmental Aesthetic) a new understanding of our way of being in the world is needed.

SENSRI's *One World* program is a five-day retreat set in the High Peaks region of the Adirondack Mountains in upstate New York. This course is designed to help each individual recognize and develop the perceptive and conceptual skills for a truly constructive and deeper

experience of the self/world. Through a series of direct encounters with the natural world, opportunities for reflection, readings, group discussions and interactions, we will begin to identify the foundational elements necessary for changing "the world." By drawing on the rich experiences of the past and learning to be consciously present, we will develop the necessary skills to help create a future that all of us can embrace.

The daily schedule will include experiences of pristine environments in nature (including hikes, snowshoeing and sledding as weather permits), and presentations on various topics related to the New Environmental Aesthetic. Students will develop a more sensitive awareness of and integration into their environment, and will gain an introduction to both historical and truly new approaches to environmental technology. The goal of this course is to provide an experience of the hopeful possibilities that lie ahead if each of us strives individually and together to create a truly new environmental consciousness.

We will be offering a One World session this coming January to older high school students. Tuition for this session is just \$325, including room and board; some financial aid is possible upon request. We have had strong interest from several Waldorf schools in the eastern United States and have begun to register a number of students from each school. If you are know of someone who might be interested, please direct them to our web site for more information or send an email to info@sensri.org.



The home base for this session of One World will be the Snow Goose Lodge in Keene Valley, a spacious, comfortable lodge with many bedrooms, large kitchen and dining rooms, and an inviting living room for fireside discussions. SENSRI has recently been searching for a place to establish a research and education center similar to the Snow Goose, a property with residential capacity, ample land adjacent to pristine rivers, and several large outbuildings. We are excited to have the chance to conduct this *One World* program there, as it will provide an ideal opportunity to experience the possibilities of operating out of what we envision as the next step for SENSRI.

