



## Awakened Science Experimentation

By JOHN BICKART, Ph.D. | **Science Education and Spiritual Transformation** / Chapter 5: Interrogation versus Observation

*"Everyone hears what you say.  
Friends listen to what you say.  
Best friends listen to what you don't say."  
- author unknown*

### Human Senses versus Technology

Do you remember being young? Do you remember learning about your body's five senses: seeing, smelling, listening, tasting, and touching? Let's take a historical



look at humankind's use of the senses when it was a youngster, then see what this means for us, today.

A while ago - nearly half a millennium ago, around the 1500s - people often spoke of qualities like color, smell, sound, taste, and feel. These qualities were given a place of high importance. Back then, scientific experimentation was largely concerned with observations of the world using the senses. Scientists (called philosophers at that time) watched nature's wildlife, plants, and physical phenomena in their native environment more than interrogating nature with specific questions in mind. But since the influence of philosopher/scientists like

Descartes, Galileo, and Bacon, human senses have become secondary in importance to qualities that can be measured. Now we often talk about measurable quantities.

Then, the role of experimentation after the 1500s started to change. We started to become a little less like friends with nature and a little more like owners. Some experiments began to ask nature to perform under circumstances that were designed by the interrogator to find out specific concepts. Increasingly, the experimenter was asking a pointed question and nature was limited to the answer to that question. In some ways, nature was treated a little like a pet that is made to sit and beg and do tricks on command. Experimentation became more head based and left brain oriented, rather than the ancient, heart based, right brain orientation. In other words, scientists looked more in a mechanical, analytical way, taking things apart and assuming that nature is made of machines. Of principal importance in this type of interrogation are measurable quantities that are usually assigned a number. Therefore, while the human sense qualities became secondary, qualities like magnitude or size became primary.

### **Integration is the Key**

We are now integrating the ancient abilities to observe in balance with parts analysis. In other words, we are combining heart and head. What is an example of an interrogation that is pointed, analytical, and mechanical? Consider investigating a flower. The analytical scientist from the recent past would remove the flower from its

native environment, stop it from growing, cut it apart, then surmise how it operates by examining the parts. This aggressive form of interrogation reduces the flower to an object. Objectifying animals, plants, and people in this period from the 1500s until now was quite common. I don't know about you, but I don't like being asked questions about my parts, only. I am a whole person - more than my parts. So, the science course of today needs to stress to future scientists and science teachers that we are not objects.

During the left brain time, there was a movement toward measurement which, of course favored technology over the human senses. A thermometer measures temperature better than human touch, and a ruler measures length better. So, the role of experimentation became increasingly about numbers and parts, objects and measurements, and technology and machinery. On the one hand, as we shifted toward technology, away from the human senses, many aspects of science improved. But on the other hand, one might ask, "Has anything been lost? Have we *thrown out the baby with the bathwater*?" This essay seeks to alert us to this shift in the role of experimentation. It recommends that we embrace the incredible new ways to use technology, without throwing away some important benefits to using our human senses.

## **Re-Integrating Our Senses**

Our senses may not be accurate measurement devices, but they are the keys to personal growth and perhaps our *greatest human power*.

If you are using your senses to be an observer, you increase your presence. This form of personal growth always ends well. Are there any events in life that are not better if we give them more attention? And what do I mean by our *greatest human power*? Let me show you with an example. Have you ever been helped by a friend who just listened? They were there for you, wholly attending. Why does that work? Somehow, science will catch up with the mechanisms of this process, but meanwhile, we can recognize the power in such an exchange. Science is at the tip of an iceberg in finding that observation helps more than people. It helps flowers, animals, and even perhaps, according to quantum effects, all matter itself. We are just beginning to scientifically measure the effect we have on the world when we observe it - and this is a power.

A good science course, especially for future teachers, may want to note this historical shift toward technology - away from the human senses. Then, a good course would ask some questions such as the following.

- Why did this shift take place?
- What has become better since the shift?
- What may have been lessened since the shift?

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## **Thinking Too Much versus the Right Amount**

"The simple reason why the majority of scientists are not creative is not because they don't know how to think; but because they don't know how to stop thinking."  
- Eckhart Tolle, *The Power of Now* (2011)

How does one *not think*? Try this experiment right now. Pay attention to one of your senses - look, listen, smell, taste, or feel something. Do it for about half a minute. Did you notice that you suspended analytical thought as you observed what your senses reported? Did you think of tomorrow or yesterday - of somewhere other than here? If you did, that was not part of your sensing.

Observing/sensing and thinking/analyzing are separate activities. They occur very closely in time, much like fMRI research has shown about electrical and visceral activity across the two lobes of the brain. The interplay is vitally important. But the act of purely observing preempts and precedes the act of thinking about what has been observed. And it happily blocks out the preoccupation with worries or anticipations about tomorrow and the laments or sentimentality about yesterday. That is why some people meditate.

***Observation is the key to not thinking. And the human senses are the gateway to observation.***

So, what have we learned so far? There are two things a student of science should do to move the **Role of Experimentation** forward while still moving our **Friendship with Nature** forward. One is to keep a balance between *human senses and technology*. A second is to use those human senses as a gateway to *observation*. Let's look now at a third way - *language* - to establish a balance between head and heart.

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## Awakened Language

The role of language is a two-edged sword. If kept in balance, it is a powerful tool for society, but the two edges of this sword could end in a duality that takes us apart. We can use words to enlighten ourselves and become friends with nature, or we can get lost in a description as a representation of the genuine, then substitute that description for relationship.

The dawning of language was different from everyday use of language. At first, we were in relationship with the world. Words gave us a way to name that with which we had come to know - our new 'friends'. But soon after that, we used words as representations of actual phenomena. We moved a primary relationship to a secondary one. The word took the place of the thing itself. Whereas the word "mother" was an all-encompassing experience of joy, it could be reduced to a cry when we get hurt or hungry.

This is very like the movement of the role of experimentation. We move from a primary relationship with nature through our human senses to a removed, representational language of names and numbers from our measurements. It is like the difference between being live and in person on a date versus having a correspondence through technology.

The trick is to continue measuring and speaking in our language, without losing actual contact - actual relationship - with the world around us.

Do you remember when you first learned language? Almost no one can. How about humankind's first language? We can only make conjectures about the dawning of language for humankind. The first 32 symbols have been uncovered on 370 cave walls across the globe that were written roughly 30,000 years ago. Henri Bortoft investigates this conundrum by looking through Helen Keller's eyes as she first experiences language.

"It is language which teaches us concepts as children, and hence it is language which first gives us the ability to see the world, so that the world can appear. But our first experience of language, the dawning of language, is different from our experience of language as adults. A vivid illustration of the original disclosive power of language—as distinct from the secondary representational function of language, as when it is used for conveying information—is given by the remarkable story of Helen Keller. As a very young girl, Helen Keller had a severe attack of measles, which left her deaf and blind. This happened to her before the dawning of language, and it was only due to the extraordinary work of her dedicated governess that these extreme difficulties were eventually overcome. The moment when this finally happened is described in her own words:

"We walked down the path to the well-house, attracted by the fragrance of the honeysuckle with which it was covered. Someone was drawing water and my teacher placed my hand under the spout. As the cool stream gushed over one hand she spelled into the other the word "water" first slowly, then rapidly. I stood still, my whole attention fixed upon the motion of her fingers. Suddenly I felt a misty consciousness as of something forgotten—a thrill of returning thought; and somehow the mystery of language was revealed to me. I knew then that "w-a-t-e-r" meant the wonderful cool

something that was flowing over my hand. That living word awakened my soul, gave it light, joy, set it free! . . . I left the well-house eager to learn.

Everything had a name, and each name gave birth to a new thought. As we returned to the house each object that I touched seemed to quiver with life. That was because I saw everything with the strange new light that had come to me.' (Helen Keller, *The Story of My Life*)

She is blind but describes herself as seeing with a new light. The word “water” does not represent or stand for water here; it is not a label to be attached to water for the purpose of communicating information. Helen Keller does not already know water, to which she then adds the word. No, in this case everything is reversed. The word “water” shows her water; it brings it to light so that she sees it.” (Bortoft, 1996)

Language sets humankind apart from the animals. Language is not just the skill of communicating information. It gives us the unique ability to be conscious of ***being in the world, but not of the world.***

"Without language no things could be, and therefore there would be no world. So the dawning of language is the dawn of the world—as we can see so clearly here in the experience of Helen Keller. This sets her soul free because to be human is to live in the world. Only human beings have a “world”—which is entirely different from inhabiting an environment in the way that animals do. Until this experience of the dawning of language, Helen Keller had been unable to be in the world, which is proper to human beings, and had inhabited a wordless environment. A human being not able to be human—and now she is freed from the darkness of this condition to enter the light of the human world." (Bortoft, 1996)



There are great advantages to the act of experimentation and discovery. The language of science can be like a light coming into a dark room, shining on all manner of treasures. The trick is to stay in that room and appreciate the treasures - not just visit it quickly, then use language to talk endlessly about it. Our goal for the future of science is to get back to this room of ours. This incredible world is a room full of riches. It is a garden of immeasurable variety. We must get back to the garden. We must learn to investigate her while simultaneously regaining friendship with her.

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## #92 *The First Great Play*



*At first, there was a great play named "The Lila". It was created by Gods and acted out the story of how the Earth grew for as long*

*as their stories remembered. You might say that if you saw The Lila that you were privy to the story of stories. It portrayed how the rocks and plants and animals and of course, the peoples of the Earth came to be.*

*Finally, the great play was ready to be presented. It was decided it would be acted out in two cities, once on the near side of the mountain, and once on the far side. Audiences were invited with the proviso that they give The Lila their utmost respect and that they attend with*

*particularly keen observation. You see, the actors in the great play were the actual elemental beings of earth, water, air and fire. So, if the audiences did not receive them well, the actors might retreat. Then, they would not be able to perform their role in running nature, herself.*

*In the near city, members of the audience were scientifically curious to learn how to control the elements.*

*They asked many questions of the actors to try to understand just how the rocks and plants worked, so that they could have the power to master them. In their zeal, they tested the actors rigorously, taking every bit of the elements' stories apart. They thought that their curiosity would be a compliment to the great play, but the actors left the near city feeling tortured and tired.*

*In the far city, the audience fell silent in awe of the beauty and majesty of The Lila. They marveled at the relationships between rocks and plants and animals. They let the natural elements speak for themselves. They felt profound gratitude for the role that people were given in the great play. So deep was their observation of the play, that they found themselves watching parts of it over and over in their minds.*

*The following years found the near city bringing storms and blight upon itself, while the far city dwelled in peace.*

### **NATURE THRIVES ON OBSERVATION NOT INTERROGATION**

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