

# TOWARD A YOGA OF THE SENSES

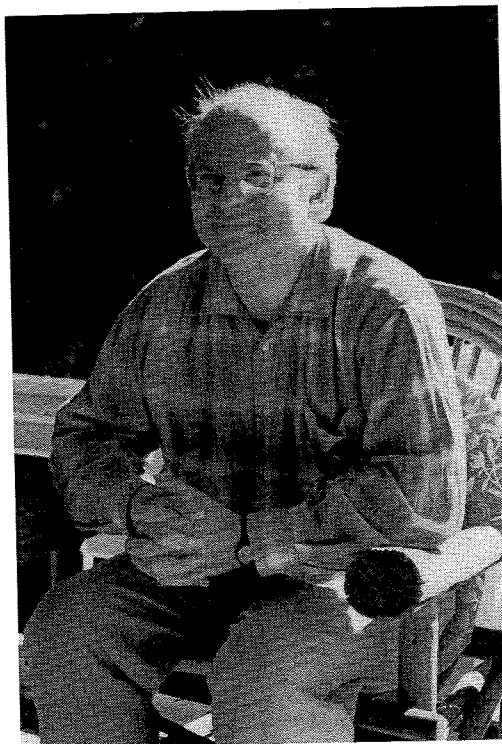
## AN ORION INTERVIEW WITH ARTHUR ZAJONC

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When we decided to take up the subject of perception, several of the staff thought of Arthur Zajonc. Several years ago Arthur wrote a book titled *Catching the Light: The Entwined History of Light and Mind*, about the ways humans perceive that most mysterious phenomenon, light. He approaches the subject as a quantum physicist and an historian of science, and also as someone with a deep appreciation of the artist's gifts of perception. We knew too that Arthur has a broad range of interests having to do with how we experience the world around us. He has recently participated in major conferences on the study of consciousness and the role of contemplative practice in modern life. He has long been a student of Goethe's scientific writing and is president of the Anthroposophical Society in America. For all these reasons, we knew he might have interesting things to say about perception.

Arthur returns to his post as professor of physics at Amherst College this fall after a two-year sabbatical during which he served as program director of the Fetzer Institute in the area of science, consciousness, and spirituality. In October he travels to Dharamsala for the Mind and Life VI dialogue with His Holiness the Dalai Lama on the topic of the New Physics and New Cosmology. His most recent book is *The Quantum Challenge: Modern Research on the Foundations of Quantum Mechanics*.

Arthur has long been a friend of *Orion*, having served on its advisory board for many years and written three articles in earlier issues. He was interviewed in his home in Amherst, Massachusetts in May 1997 by Aina Niemela, *Orion's* former managing editor.



**Orion:** In biology classes, teachers often compare the eye to a camera. From your work on light, do you find that a useful comparison?

**AZ:** It was actually Leonardo da Vinci who suggested that the camera obscura, which was invented in the tenth century by the Arab optician Alhazen, might be connected to vision. That the eye itself is a camera obscura has become a commonplace taught to every high school student. From the purely physical standpoint it is accurate. That is to say, light does pass through the lens, is focused on the retina, and the image, inverted, resides there.

But clearly, already, from the fact that the image is upside down on the retina, we experience, in a profound way, that our picture of vision is incomplete, because vision entails us seeing the world right side up, entails us making sense of that world. The purely physical phenomenon of light refracting through the lens of the eye and falling on the rear of the eyeball is inadequate to understanding vision itself.

**Orion:** So the eye is not altogether passive?

**AZ:** No. This was brought home to me nowhere more clearly than in studies of individuals who have been blind from birth. Consider the case of an eight-year-old child, operated on in 1910 by the French physicians Moreau and LePrince. Following surgery, the child had two eyes that from the purely physiological standpoint were perfectly fine. The bandages were removed, and one of the physicians waved his hand before the child's eyes. The child strained to

see but saw nothing. He could hear the movement of the physician's hand before him but the sight of the hand was indecipherable, actually incomprehensible to him. That is to say, while the raw sensations fell on the retina, stimulated his nervous system, he had no conception with which to meet them and therefore he saw nothing intelligible.

So, as I have described in my book, there needs to be another piece wedded to the physical dimensions of vision, namely that aspect that I call an inner light, or the light of the mind, which is connected with the outer light that falls on the eye and on the retina. It's only when the two of these come together that vision actually occurs. If there is no inner activity that joins with the outer activity, then one doesn't see.

**Orion:** We don't often think of sight as active.

**AZ:** The activity becomes obvious when you consider a so-called ambiguous figure. If you take a few minutes and allow yourself to play with it, the figure changes. The picture on the printed page remains the same, but your own activity reconfigures it.

**Orion:** In your book you go into detail about how that inner activity has changed through the ages, with the suggestion that we are at some sort of a verge now, where we may be going to see very differently.

**AZ:** I think where we are now is that we have the possibility for the first time to really study and appreciate not only our own contemporary view of the world but the views of every age that preceded us. And even contemporary cultures other than our own that have radically different ways of seeing things.

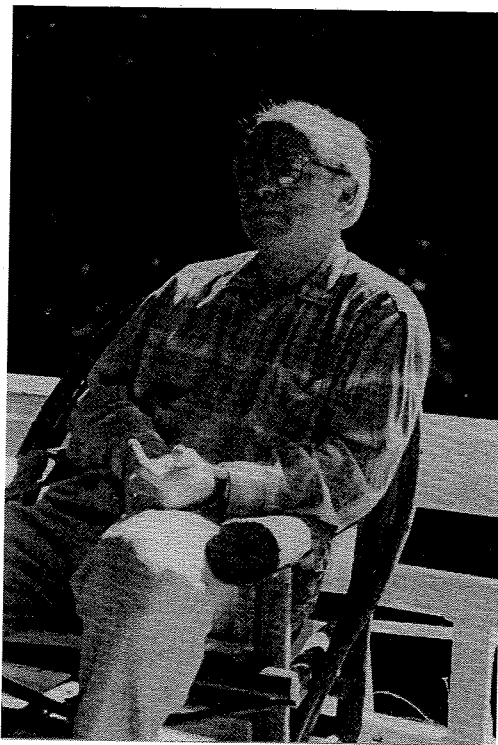
Let's take an example from the ancient world of the Greeks. Whereas we experience the sea to be blue, time and again one finds in Homer the sea as *kyanos*. But Hector is described as having *kyanos* hair. Clearly his hair was not blue. There is a similar situation around the word for green, *chloros*. What is going on here? I would suggest that the Greeks brought to the world of color such an active imagination, such a power of the inner light, that in some ways it overlit what it was that was coming from the outside.

You find other examples in non-Western cultures. In African cultures, for instance, if one draws a picture of a human being in profile, people will be confused, because they know that on the other side the person's face looks different. They can't imagine seeing a face from a single point as one would in perspective drawing. Just as prior to Brunelleschi and prior to the development of perspective

in the fifteenth century in Europe, some contemporary cultures experience the world around them not from a single-point perspective but from a multi-point perspective. In both of these cases you get a sense that there's something quite animated going on in the process of vision, and that it is distinctly different from the way we make sense of the world.

What distinguishes our own time from those that went before is that we have the possibility of seeing that single external reality from all points of view, the possibility of going around and assuming the position of the African bushman, of the quantum physicist, of the Romantic poet, and so on.

**Orion:** We can see that reality with our understanding, but can we really see it?



**AZ:** You raise a good point. I would say the first stage in being able to see things from a different standpoint is to see them intellectually. We can imagine to ourselves what it must be like for somebody else but we don't actually move into that modality of consciousness. That would be much harder.

In fact, the phenomenologists, the Buddhists, and other practitioners of consciousness have worked with this question, and you will find exercises in both Western and non-Western traditions which are intended to, as it were, bracket, or call into question the habit of seeing, so that not only do we understand intellectually that others may see the world differently than the way we do, but that we ourselves are able to shift our consciousness into a modality that sees the world differently.

**Orion:** And can we really make that shift?

**AZ:** According to the reports, and to a limited extent in my own experience, it is possible. A trivial example of this would be students who are aspiring naturalists. They walk through the woods, they see relatively little. Why? Because the habits of seeing have been framed on a very restricted world—perhaps a world of books and class studies. They go out with their teacher on a set of field trips, and they discover, through the eyes first of their mentor, a world that they had not seen, and grow in themselves the capacities to see that world.

One could then imagine that naturalist going to Central or South America and meeting with indigenous peoples of that region, and wandering in the woods with them. Is it possible that this Western naturalist is able to

primitives, of modern science, whether they are atoms, molecules, genetic material, and so forth—what is the connection between those invisible entities and the visible world that's around us?

If I stick to my own world, physics, the way I have come to understand it is that, for example in quantum physics, one is compelled by the data from rigorously run and repeated experiments to entertain or view the world in a radically different way—view it intellectually, that is. For example, take the famous attribute or characteristic of non-locality. Every object in the normal world has a place, has a location. The paper clip on the table is a simple object, it is located there. In the quantum world, simple objects, and especially pairs of objects, do not have in all instances a simple location. Very often they have an ambiguous sense of location or even a paradoxical and classically impossible sense of place. To explain how that is would take us beyond the scope of this conversation. But if one says, okay, we take from the physicist, based on many experiments and the attempt to understand the meaning of those experiments, that location of objects is called into question in the most elementary sense—that puts an unprecedented demand on our thinking. Because the pattern, the habit of thought we have is one that always ascribes a place to an object. To imagine an object that does not have a simple location challenges us. We wag our heads.

Now, I find that extremely stimulating, that we are challenged, not just by abstract mathematical conceptions, but we are actually challenged by the data, the hard data of contemporary physics, to think of the world in a fundamentally different way.

**Orion:** But don't these data undercut the validity of sense phenomena? Don't they make you totally distrust your own eyes—and your ability to operate as a human being?

**AZ:** They might. If we take the world as given by the physical senses to be the full reality, then certainly what you have said is true. In that world every object does have a place. However, if you go to, say, the aborigines of Australia and talk to them about dreamtime, they will tell you that they can be in a place other than the place they are during normal time. In other words, they have a domain of experience, not only a domain of conception (which is what the physicists have), which we would find defies the notion of simple location.

What I see quantum physics as doing is opening up a door to a potentially new domain of experience. But physics itself does not push us through the door. It simply says, listen, maybe you've never thought of the world in this way. Now you have to— it's not just that you could, as a kind of game, but if you are a physicist, you have to entertain these thoughts. They are still considered to be paradoxical and impossible on one level, because our domain of experience is grounded in the senses. If that's the only domain of experience, which is what Niels Bohr and most of the physics community maintain, then the paradox will remain completely unresolved. Our experiences, which are

always sense-based, always classical, will always stand at variance with what the theorist and the quantum physicist will say is going on.

However, it is possible to hold a different view, and it's a view I hold, that experience is malleable. The examples I have given in my book on light show us how malleable the experience of light can be, because we can bring to the experience the outer world presents us this varied activity, this meaning-making, which is our own light, the light of thinking. Is it possible therefore to bring a kind of activity into that domain of experience that would, for example, open up the possibility of bilocation or a new sense of non-locality—not just as an idea but as an actual experience? I think both in philosophical and especially non-Western traditions one finds hints of this.

**Orion:** You speak of the malleability of sense experience—how does thinking affect our perception, how does that work?

**AZ:** In my own view, Goethe was one of the earliest thinkers to emphasize the importance of thought in the activity of sense perception. For Goethe, however, this was not an abstract, philosophical approach. Rather, he spoke of organs, not meaning the physiological organs, but inner organs of sight. One of my favorite lines goes: "Every object well-contemplated creates an organ for its perception." In other words, while we may have a physical eye with which to see light and color, in order to comprehend, to intelligibly configure a landscape filled with diverse and sometimes novel objects, requires that we contemplate what it is that is before us, that we hold it in our attention. That act of attending reconfigures the mind, shapes it, gives it new form, creates, in Goethe's terms, an organ.

Goethe saw this as analogous to the way the eye itself must have been formed. He wrote once, "Out of indifferent living matter, the eye is formed by light for the light, so that the inner light may meet the outer." That inner light I think of as the light of intelligence, the light of thinking. This is not a passive function but rather an activity brought into sensation, one that can be refined again and again.

**Orion:** So our visual environment becomes very important.

**AZ:** Yes, and the implications for education are obviously enormous. In this time when we speak so quickly of the neuroplasticity of the brain and nervous system, dendritic growth, it is clear that only a carefully orchestrated, rich perceptual environment can nurture the full potential of the growing child's sense faculties.

**Orion:** You have given lectures on how we can deepen our sensory engagement with the world through meditative practice. The title is intriguing: a yoga for the senses. Will you explain?

**AZ:** The spiritual practices of the East have come over to the West in a very diminished form. The breathing practices one knows from Buddhism have been helpful for

many Westerners, but others find they have no connection to it, or very little. I think for all of us, the natural world constantly beckons, constantly offering itself. So, is there a way to attend to the natural world such that you develop what I call a yoga of the senses, as opposed to a yoga of breath—a way of being in dialogue with the world around us, breathing the sense world in and out?

**Orion:** Is there such a practice in Buddhism?

**AZ:** Yes, there is something called the *kasina* practice, where one starts with a sense object, let's say a bird or a plant specimen—that's easier because they stay put. One attends to the plant that's before one and looks at it with a deep appreciation, very intently. Quietly, but very intently. One does that for several minutes, maybe even longer. And then one turns away from the object, away from the plant. At first there is just an emptiness. There's the absence of the plant. Rather soon, however, there starts to arise within the inner field of attention a mood or a gesture, sometimes very vague, other times more vivid. And then that passes away. In the Buddhist tradition this is called the *nimata*, or afterimage. One can strengthen that image through repeated exercise. One turns back to the plant, one attends to it, and then, when one has saturated oneself with the sense impression, one turns away. Again the gap, and the arising of the afterimage. The *nimita* is not necessarily, I would say not primarily, a visual image. What one sees is the gesture, the inner quality, as it were, of that particular plant. It might have a particular intensity, a kind of exuberance, or perhaps it has a very gentle, modest appearance. Those dimensions of the experience come to the fore, in the wake of the sense experience. When one is dominated by the sense experience, the interior and exterior are living together. When one takes away the exterior impression, the inner impression can come to the foreground. In the Buddhist practice, one eventually comes to the point where one no longer needs the outer impression. The inner impression becomes so powerful, so dominant in one's field of consciousness, that it becomes an object of contemplation in and of itself.

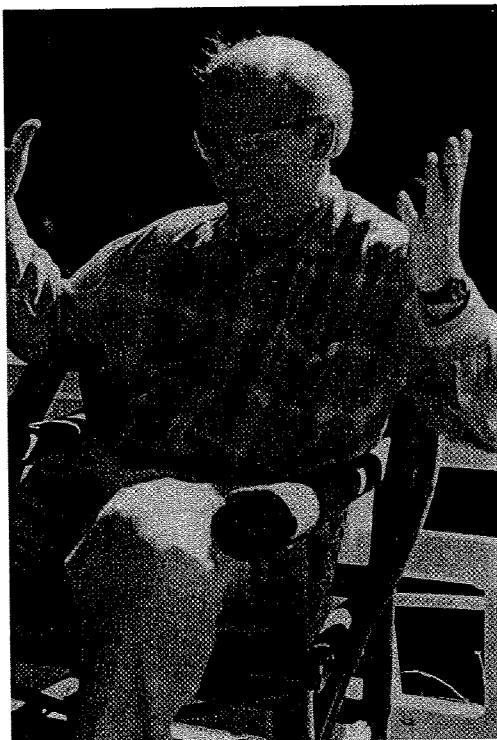
**Orion:** Is this a practice you follow yourself?

**AZ:** Yes, but my own contemplative practice derives from my long involvement with Goethe and Rudolf Steiner. Steiner in particular has gone very far with sense-based exercises. I once asked a Buddhist friend and scholar if there was anything

comparable to Steiner's sense exercises in Buddhism. That is how I came to learn of the *kasina* practice.

I think this whole direction is important. This dialogue between the natural world of the senses and an inner world that rises up in response I find to be another helpful way of gaining an intimate relationship to the world around us. If one can find the right rhythm—that cadence of engagement, then disengagement with attention to the inner, then reengagement, then disengagement—there is a growing intimacy with what it is that's before one. And I think this is especially of value in the West. One wants to develop a spiritual practice that could somehow speak directly to those who love and care for the natural world.

**Orion:** Yet the practice you have described doesn't seem like one a teacher could simply assign students in an environmental studies class. How would you begin to approach such a discipline?



**AZ:** Through the arts. Through drawing, through poetry, for example. You might ask students to go outdoors, find a place within the forest that they found pleasant, and just sit there and observe around them for awhile. Then after, say, fifteen or twenty minutes, ask them not just to journal, but to compose a poem on some part of that little environment. They are going to have to move from external observation to something interior. That's what poetry is about. One begins, whether it's written or visually, with the object, then one finds a way to release the object so that the interior experience can be at the fore. It's very much like the *kasina* practice.

This conscious moving between outer world and inner world is, I think, profoundly helpful in refining our awareness. We are not seeking a form of consciousness that is completely cut off from the world but rather one that has a deeper and more intimate awareness of the world. We need to find ways of refining that awareness. The Buddhist practice is a helpful one, but I think that in the arts and the crafts one also finds useful techniques.

**Orion:** You have suggested how contemplative practice offers a technique for nature study. Does this approach offer anything to the scientist?

**AZ:** The scientific study of nature as performed by the molecular biologist, geneticist, physicist is very distant from the sense world. Nature study by the field biologist or the nature writer possesses a form of sense engagement which, in my way of thinking, also contains, or can contain, contemplative aspects.

**Orion:** I can see that being true for the nature writer. How is it so for the scientist?

**AZ:** The scientist or student of nature examines the natural world, whether an individual species or a complex ecosystem, carefully attending to the external features and relationships within that domain. We are confident that the more complete the analysis, the deeper will be our scientific insights. I can only agree with this. However, at root every experience is qualitative. As we refine our way of seeing, we also develop an intelligence concerning these qualitative dimensions of the world around us. Coming back to Goethe again, we can ask whether it is possible to develop a science of qualities, that is to say, an approach to the qualitative dimensions of the natural world that possesses the clarity and refinement of the quantitative sciences. In fact I believe we naïvely do much in this direction. Many of our most important decisions are made after a careful qualitative analysis of the options before us. The qualitative as a dimension of experience is extremely rich in information. We neglect that fuller information at our peril.

Moreover, in some instances, perhaps even in most instances, the qualitative experience is holistically structured. That is, there are many contributing components to felt experience. A biologist may step into a rainforest and recognize the health or lack of it in a particular region through a multiplicity of impressions, which integrate very quickly in his or her own mind to a judgment. One can of course break out specific quantitative measures to substantiate that judgment. These impressions may arise as a gestalt. We should not underestimate the power of a gestalt as a form of, if you will, perceptual intelligence. That gestalt is created once again by the marriage of sense impressions and a highly refined intellectual activity, which meets the rich tapestry of the senses' input and configures the whole.

**Orion:** Presumably it would be possible to produce a "virtual reality" experience of a rainforest. What would distinguish the real nature from the simulation?

**AZ:** At one level, we can respond trivially by saying that the natural world is composed of substance, whereas the electronically produced virtual world is entirely illusion or a simulation, devoid of substance. Does it make a difference that sense impressions arise from a substantial universe?

**Orion:** I guess that's my question. Thank you.

**AZ:** This is actually an old question. I say that because artists and craftsmen have always created artificial objects and placed them into the world of natural objects. In this case the sense experience is still connected to a substantial reality, the sculptor to clay, the painter to paint, and so on. The world they produce is an artificial one, but made by their hands.

It's an enormous step from the artist or craftsman to the virtual electronic production, where the craft is released

from matter to pure form, to pure electronically produced sensation. No longer do the senses need to be attending to an embodied sense reality, or perhaps one could say, the form of embodiment is extraordinarily abstract, it's electrons striking phosphors on a computer screen, the pattern generated by the formal coding of a particular intention into the computer program. If I think of the mind as the smithy, then no longer is there a forge, an anvil, my own brawn and skill brought to bear on the iron. Instead my thoughts are brought directly to bear into this new electronic medium. I forge electricity and magnetism instead of earth or iron. This is a significant shift. The artist, whether ancient or modern, confronts a moral dilemma.

**Orion:** How so?

**AZ:** Nature, I believe, has produced a world not only filled with lawfulness in a scientific sense, but ultimately one that we can trust. We've grown up and developed in this world, as a species and as individuals, over many millennia. We are formed by it as an expression of it, and therefore one could say, integrated, adapted to it in a moral sense.

The development of advanced computer technologies means that a whole new world assaults our senses. What we have today in the form of virtual reality or electronic media is still extremely primitive, although powerful in its workings on our consciousness. One can imagine a time when virtual reality machines are fully accomplished, bringing all sensory modalities into play in a way that mirrors the full, complex, multi-dimensional impressions that we gain from the natural world. We would not have time, physiologically or even psychically, to adapt. It is therefore enormously important that we fully consider the moral dimensions of this technology, and that the artists of virtual realities appreciate the impact they will have on the minds of young and old alike.

**Orion:** If more people attain the kind of deeper perception of nature that Goethe was pointing to and that the Buddhist practice you describe would lead to, what difference would it make in the world?

**AZ:** First let me say that our future will in some measure be a virtual future. We will live in built environments, not in small communities in the forests and fields. Our home environment will be highly mediated.

I believe a yoga of the senses or an attentive relationship to the natural world leads in and of itself to a growing synchrony with the rhythms, the textures, the qualities of the world in which we have evolved as a species. It can only bring deep inner balancing and health. Having realized these qualities personally, we can attempt to bring them into our organizations, business, family, the built environment of home and city. Ecological design will become then an imperative for our society. It is a question of bringing the lessons we have learned from nature concerning the harmonies, beauties, and deep morality which she embodies into that built environment. ●