

The Role of Esthetic Processes in Cognition

Remarks (for the ASTC Session with David Hawkins and Terrence Deacon)

Paul Tatter, October 19, 1998

“Beauty is truth, truth beauty,”—that is all
Ye know on earth, and all ye need to know.¹

Are these words so strange? Keats may have been musing about the wisdom of truth that comes from esthetic experience, but there’s great insight in noting that an esthetic underlies and permeates all that we call learning and knowledge. In *The Language of Nature*, David Hawkins discusses broader meanings of truth than the semantic truth of statements or propositions. He says, “We use such meanings when we talk about poems, novels and plays, maps and models. We attribute truth to them all in one way or another, a truth that may be called verisimilitude.”² For us to even begin to understand the role of esthetic processes in cognition, esthetic processes need to be rescued from museums and restored to ordinary experience. As John Dewey suggested, it’s a problem “of recovering the continuity of esthetic experience with normal processes of living. . . . the sights that hold the crowd—the fire engine rushing by; the machines excavating enormous holes in the earth. . . . in tending the patch of green in front of the house; the zest of the spectator in poking the wood burning on the hearth and in watching the darting flames and crumbling coals.”³

Why is it so difficult to talk about what ordinary esthetic processes have to do with ordinary cognitive processes? Perhaps part of the difficulty is that esthetic processes have been relegated to art, and we are not in the habit of talking about them in another way. Perhaps it is that, as biological functions, esthetic processes are always in mid-stream; there is always something antecedent and future so that our starting point is elusive and never at the beginning, but always somewhere well along in the flow. Perhaps it is because the habits of conversation that we have for other topics are not there for this one—we have created no formalism, no systematic context or consistent language for talking about ordinary esthetic processes. Just consider the multitude of conflicting ways we speak about esthetic processes: as perception, as sensibility, as judgment, as intuition, as insight, or as a sense of fit or rightness. It’s no wonder we may be confused and timid about where to start.

The esthetic quality of phenomena encountered in living, our esthetic perception and esthetic responses to our experiences attract and hold our attention; they arouse our interest. Esthetic intuition influences the selection of data we attend to and the choice for selecting a course of action or experimentation among the myriad possibilities available. It is our esthetic sensibility that erupts with delight at the discovery of an unexpected awareness of connection or fit. It is our esthetic judgment that supports our sense of the rightness of an idea and the feeling of appropriateness and satisfaction at the consummation of understanding or of activity. I speculate that esthetic processes in human development

¹ John Keats, “Ode on a Grecian Urn.”

² David Hawkins, *The Language of Nature* (San Francisco: W. H. Freeman, 1964), pp. 31-32.

³ John Dewey, *Art As Experience* (New York: Minton, Balch, 1934), p. 10, p. 5.

function to inhibit or interrupt habitual, instrumental activity and create opportunities for thought and activity that have no immediate, directed survival or instrumental need.

In this regard, esthetic events share features with play. The esthetic inhibition of habitual activity is important to a symbol-using organism, because it allows opportunities for the growth of signs, or ideas, on their own account. It channels attentiveness to the associational features of ideas or of the meanings of signs. An esthetic habit of attention is pre-adaptive or co-adaptive to learning with symbols. Occasions that allow the relatively free association or disassociation of representations, or of elements of representations, would be of great considerable utility to a symbol-dependent species.

Images, diagrams, metaphors, mathematical equations, maps, models, analogs of all kinds are examples of iconic signs. I suspect that all symbolic thought is grounded in the esthetic association of icons, and progresses primarily through the creation of metaphors and analogies. The leaps in inference, which go beyond the symbolic information given, are evidence of esthetic, icon-associated, metaphor- and analogy-making processes at work. The leap of inference is an esthetic leap. We commonly call the means for such leaps intuition, and intuition is at root an esthetic insight or judgment.

Iconic representation comes close to regarding or treating an idea or a concept as a reality. It resembles a test or an experiment in that a sense is gotten of the value of acting on the basis of it. The American scientist and philosopher C. S. Peirce said, "The work of the poet or novelist is not so utterly different from that of the scientific man. The artist introduces a fiction [an idea not contained in the data, which gives connections which they would not otherwise have had]; but it is not an arbitrary one; it exhibits affinities to which the mind accords a certain approval in pronouncing them beautiful, which if it is not exactly the same as saying that the synthesis is true, is something of the same general kind. The geometer draws a diagram [an icon], which if not exactly a fiction, is at least a creation, and by means of observation of that diagram he is able to synthesize and show relations between elements which before seemed to have no necessary connection."⁴

Esthetic is a term that applies to those components of cognition not accounted for by habits of symbolic function, such as the habits of perception, feeling, intuition, and a sense of rightness. Phenomena experienced in the relationship of these components are grounded first and last in esthetic representation. The esthetic shapes and edits our sensitivities and is the recourse for creating models and analogs of these experiences that can be re-represented in symbolic form. A question here is: What truth can we understand about something by attending to our perception of it through an esthetic experience?

A few years ago, I was watching videotape of my friend Bernie Zubrowski and some children engaged in informal science.⁵ They were messing around with a couple of liter

⁴ Charles Sanders Peirce, *Collected Papers, Vol. 1*, ed. C. Hartshorne and P. Weiss (Harvard Univ. Press, 1965), p. 203 [1.383].

⁵ Bernie Zubrowski, *Salad Dressing Physics*, (Video) Preliminary Version, Education Development Center, 1995.

soda bottles that were joined at their necks, each full of a liquid of different viscosity. “Wait! Are they both liquids? Like soap?” asked one child, searching for an analog in his experience that he could apply to the behavior of this material. He was not yet asserting the analogy; he was asking a question. He had a hunch. If they were liquids like soap, then perhaps he could anticipate their behavior, or even account for it.

Bernie confirmed that they were liquids, because they were flowing, but didn’t confirm the analogy. “Oh, so they’re just, like, squishy-like,” the child kept searching, trying out the analog through its attributes. Bernie didn’t respond to this verbally, but he did call attention to the clear liquid rising up the side of the bottle. “Just like soap!” said the child, now asserting the analogy. “How is it like soap?” asked Bernie, requesting the child to apply the analogy, or to justify it, which may or may not be the same thing. And the child responded, “I don’t know.” Now, that’s interesting. I think he really didn’t know in a way he could express symbolically. He had selected the soap analog by intuition, or feeling, by an esthetic judgment. It felt right, or at least as close to right as he had within his experience.

An important effect of an analog is that it establishes continuity between the past and the present. If there is continuity, then not only may understanding of a new experience be interpreted by the past, but the past experience may be re-examined and re-interpreted by the present. And this in turn may be applied to a new experience and so on. An analogy is traversed in both directions, which is one reason for its power in developing thought.

The development of learning and thought depends on the initial partial success and the ultimate partial failure of analogies. From the beginning we feel that analogous things are the same, but know that they are different. Saying “it’s the same, only different” makes perfect sense to any child. Initially, the similarities among constituents of an analogy seem to have the most value. Ultimately, as analogies are elaborated the differences acquire equal or more value. The differences free constituents of an analog to become analogous to new experiences, to develop independently from their prior associations, yet the lingering similarities tie them together in a world-view. Experiences being the same only different are necessary for both the structure and the dynamics of scientific thought. Our tolerance for this cognitive dissonance, even more our thirst for it, and often our delight in it is grounded in the strength of our esthetic impulse.

Later on in their investigative play the children notice bubbles of one liquid rising through another, and one says, “It’s like a fish blowing bubbles!—but without the fish.” This makes sense to everyone there. It’s interesting because the causal part of it, the fish blowing bubbles, is irrelevant to the immediate use of the analog. There is nothing like a fish making bubbles in the bottle, and even if there were, that wouldn’t be the point. The children were concerned only to describe the movement of the bubbles through the liquid.

People need to make adjustments and caveats to their analogies in order to use them at all. They need to be able to say: It’s the same, only different; it’s like a fish blowing bubbles—but without the fish. Significant advances in scientific thought have depended on such partial application of an analogy. Werner Heisenberg wrote, “It is not surprising that our language should be incapable of describing the processes occurring within the atom. . . . for

visualization, however, we must content ourselves with two incomplete analogies—the wave picture and the corpuscular picture. The simultaneous applicability of both pictures is thus a natural criterion to determine how far each analogy may be 'pushed'.⁶

On this subject, Niels Bohr said, "When it comes to atoms, language can be used only as in poetry. The poet, too, is not nearly so concerned with describing facts as with creating images and establishing mental connections."⁷ Heisenberg remarked, "We could clearly sense that he [Bohr] had reached his results [the theory of atomic structure] not so much by calculation and demonstration as by intuition and inspiration. . . . Quantum theory thus provides us with a striking illustration of the fact that we can fully understand a connection though we can only speak of it in images and parables."⁸ It's worth mentioning that, especially through functional modeling, science centers could become quite good at engaging this mode of understanding.

The creation of analogies and networks of analogs, and the predisposition to hold on to the dissonances created by their partial failure are grounded in esthetic processes in cognition. I believe that these processes give us what Terry Deacon describes in *The Symbolic Species* as the "ability simultaneously to entertain inconsistent alternative perspectives extrapolated from the same initial context. . . . [and enable] The shift of representation from one system of associations to another parallel but previously unrecognized one. . . ."⁹ An example of this ability and such a shift, and of the utility of esthetic dissonance, is the great analogy created by us all: that you are like me and that your understanding is like mine. This analogy breaks down every day, yet we continue to use it because of its vast richness and necessity. The analog works, but the dissonance it creates is just as important as the consonance. We are the same—only different.

Analogies run the gamut from specificity, like Carl Sandburg's metaphor of fog coming on cat feet,¹⁰ to great generality, like the application of evolutionary models to neuro-cognitive processes. Analogs need not be linguistic or symbolic. They can be images, diagrams, models, phenomena, environments, experiences, gestures, actions or behaviors; they can be pieces of art. I anticipate with delight the day a physicist tells me about a new idea concerning subatomic particles, and when I ask "What is it?" she commences to hum a few bars. Our esthetic dispositions and sensibilities imbue learning with substance, with creativity, wonder, humor and with joy. They lead us to things entirely unexpected.

With sentiments reminding us of Keats and Peirce, Heisenberg said, "If nature leads us to mathematical forms of great simplicity and beauty . . . to forms that no one has previously encountered, we cannot help thinking that they are 'true'."¹¹

⁶ Werner Heisenberg, *The Physical Principles of Quantum Theory*, tr. Carl Eckart (New York: Dover, 1949), p. 11.

⁷ Niels Bohr, quoted by Werner Heisenberg in *Physics and Beyond*, tr. Arnold Pomerans (New York: Harper & Row, 1971), p. 41

⁸ Werner Heisenberg, *Physics and Beyond*, p. 38, p. 210.

⁹ Terrence W. Deacon, *The Symbolic Species* (New York: Norton, 1997), p. 420.

¹⁰ Carl Sandburg, "Fog."

¹¹ Werner Heisenberg, *Physics and Beyond*, p. 68.