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REORIENTING AESTHETICS, RECONCEIVING COGNITION

Catherine Z. Elgin

Harvard University

Abstract: Nelson Goodman contends that the arts function cognitively. To make his case requires reconceiving cognition. This paper shows how Goodman's reconception reorients aesthetics, focussing on features and functions of works of art that other aesthetic theories ignore. It argues that the reconception is necessary, not only to understand art but also to understand science. The import of *Languages of Art* thus extends beyond the aesthetic realm.

The claim that the arts function cognitively is radical enough. But characteristically, Nelson Goodman goes further. He doesn't think that the arts just play a bit part or even a supporting role. With the sciences, they deserve top billing. '[T]he arts must be taken *no less seriously than the sciences* as modes of discovery, creation and enlargement of knowledge in the broad sense of advancement of the understanding.'[i] If this is right, then neither art nor science fits the familiar stereotypes. I think it is right. And I think that if we do not acknowledge the deficiencies of the stereotypes, we misunderstand science as deeply as we misunderstand art.

An easy and obvious reading of Goodman's claim belies its boldness. That reading presupposes that we already know exactly what functions are cognitive. We, as it were, have a list. The novelty of Goodman's aesthetics then lies in contending that works of art perform some -- perhaps many -- of the functions on the list. In that case, to evaluate his position, we simply run down the list and see how many of the known cognitive functions works of art perform and perhaps (if we

want to decide whether *Languages of Art* contributes to aesthetics as well as epistemology) how many of the known aesthetic functions the list contains. Goodman does, of course, believe that works of art perform known cognitive functions. So the obvious reading is not false. But it is too narrow. For Goodman also believes that by attending carefully to what the arts do and how they do it, we can identify hitherto unrecognized or underappreciated cognitive functions, thereby enriching our conception of cognition. This is no mere matter of expanding the range of the term 'cognition' so that it encompasses the deliverances of art, for the duly enriched conception of cognition provides insights into how the sciences advance understanding as well.

Goodman does not contend that the arts and the sciences perform all the same cognitive functions, or that the functions they both perform carry the same weight in the two disciplines. Science and art are not, on his view, cognitively equivalent. Nor does he hold that either supervenes on or reduces to the other. The issue is not the equivalence, but the importance of what each discipline contributes. If Goodman is right, failure to appreciate the contributions of the arts yields as distorted and impoverished a conception of cognition as the failure to appreciate the contributions of science would.

This might seem to admit of a quick and decisive refutation. The proof would go as follows:

> Cognition is a matter of belief. To believe something is to hold it true. Hence the standard of success for belief is truth. Science seeks and often finds truth. Thus it immediately and directly serves cognition. Art typically neither seeks nor finds truth. Only rarely and by accident do the deliverances of art take the

form of true beliefs. Therefore, if cognitive advancement is our goal, science deserves to be taken far more seriously than art. Q. E. D.

The foregoing argument encapsulates a variety of misconceptions about art, science, and cognition. We cannot hope to see our way clearly unless we disabuse ourselves of at least some of them.

Let's begin by looking at cognition. Clearly, beliefs are cognitive. But cognition does not consist exclusively of beliefs. At a minimum, perception, recognition, classification, and pattern detection are also cognitive. Although they sometimes affect belief, their doing so is far from inevitable. Nor are they cognitively inert when they fail to inform belief. Seeing an owl, whether or not the sighting registers as belief, is a cognitive accomplishment. None of this is controversial. But if there is more to cognition than belief, then the fact (if it is a fact) that the arts often do not engender beliefs does not show that they are peripheral to cognition.

Belief, I suspect, involves far more than internally assenting to sentence. Still, it seems, to believe that *p* is to believe that *'p'* is true. If so, truth is a factor in fully successful belief. But truth is not the only factor. If it were, success would be readily achieved. Trivial truths are ubiquitous. They are also fecund. Like other sentences, they have infinitely many logical consequences -- indeed, infinitely many obvious logical consequences. So there is no favoring science on the grounds that it yields a larger number of truths than amassing obvious information does. If our overriding cognitive goal is the accumulation of true beliefs, we should restrict our attention to trivia, and devote ourselves wholeheartedly to efficiently learning trifles. Nothing so venturesome as science would be remotely reasonable. For

science is a risky business. It puts forth bold hypotheses that stand a good chance of turning out to be false.

This is not the place to mount a full scale attack on the contention that science is, or aspires to be, a bastion of truth. Nevertheless, I want to suggest that even a casual look at actual science casts doubt on it. Science plainly does not seek every truth. It is indifferent to trivial truths about nature and to both trivial and significant truths about other things. Although there are truths about such matters as the number of dandelions on the Cambridge Common, the colors on the Icelandic flag, and the literary sources of Hamlet, science has no interest in discovering them. Exactly what falls within the scope of science is controversial, but it is clear that not all truths fall within its purview.

The convictions that science seeks only truth, and that reputable science -- or even ideal science -- consists entirely of truths are also problematic. Science generates models that involve idealizations, approximations, and simplifying assumptions. To understand a scientific model, to interpret it correctly, is not to construe it as a literally true representation of the phenomena it concerns. This is not to say that science is a pack of lies. Rather it is to say that the symbols that belong to science, like the symbols that belong to art, require careful interpretation. Often a direct mapping from words to the world is incorrect.

Once we recognize that there is more to cognition than belief, and that science stands in a complicated relation to truth, we have reason to look at cognition through a wide angle lens that enables us to recognize features of understanding that the narrow focus on true belief obscures. I cannot hope to offer a comprehensive theory of cognition here. The best I can do is sketch some of the ways that Goodman maintains that the arts function cognitively, relate these

contributions to those of the sciences, and suggest how together they enrich understanding.

Works of art, Goodman maintains, belong to symbol systems with determinate syntactic and semantic structures.[ii] So if we want to investigate the cognitive contributions of art, we should consider what its symbols do. One caveat: no more than science is art monolithic. Neither all art nor all works in a single art symbolize in the same way. The symptoms of the aesthetic that Goodman identifies are indicative, not demonstrative of aesthetic functioning. Several of the symptoms are regularly found in symbols that by no stretch of the imagination have anything to do with art. Some of the symptoms are found in some arts and some works of art, but not in others. This, indeed, is part of Goodman's point. Once we disabuse ourselves of the conviction that the arts and the sciences are essentially disparate, we find a host of affinities that cut across disciplinary lines.

Goodman identifies five symptoms of the aesthetic: syntactic density, semantic density, relative repleteness, exemplification, and multiple and complex reference.[iii] A symbol system is syntactically dense if the finest differences in certain respects constitute differences between its symbols. The sort of density at issue here has nothing to do with obscurity. Goodman uses the term in its mathematical sense. Just as the real numbers are dense in that between any two there is a third, a symbol system is syntactically dense, if between any two symbols, however similar, there is room for a third. In such a system, every difference in certain respects makes a difference to the identity of the symbol in question. A drawing is syntactically dense, in that the slightest difference in a line would make it a different symbol. This is so whether the drawing is a work of art or a scientific illustration. A linguistic symbol -- a letter, a word, or a complex of words

-- is not syntactically dense, for so long as its spelling is preserved, differences in pronunciation, type face or handwriting do not affect its identity. Any inscription that is spelled the same as 'Jabberwocky' is an instance of the poem. Syntactically dense symbols cannot be replicated. No difference, in the respects that matter, is small enough to be inconsequential. This is not to say that we can detect infinitely fine differences. Clearly there are limits to perceptual acuity. But those limits are variable. What we cannot discern today may become discernible tomorrow. If we know that a symbol belongs to a dense system, we realize that there may be as yet undetected differences that are relevant to its identity.

A system is semantically dense, if it has the resources to represent the minutest differences between things. Both pictorial systems and languages are semantically dense. There is in principle no limit on the differences that can be represented in each. Again, this is so whether symbols are scientific or literary. On the one hand, semantic density allows for limitless precision. On the other, it invites indecision. It may be impossible in principle to tell which of two candidate denotata constitutes the referent of a semantically dense symbol. Does the symbol represent the moon, the nearly full moon, the nearly full moon seen shortly after sundown on a Tuesday in March from a vantage point in Cleveland Heights? It could represent any one of these, or any of a vast array of alternatives to them, and there may be no way, even in principle, to settle the matter conclusively. This is why, even though the language of science as a whole is semantically dense, scientists standardly specify limits on the precision of their claims. They say things like, 'This finding is accurate to six significant figures,' indicating that differences beyond the threshold of measurement are scientifically irrelevant. This enables them to achieve agreement about what a particular symbol signifies. Artists place no such

restrictions. So disputes about what exactly a work of art refers to may be interminable.

In dense systems, the slightest differences between symbols can carry enormous weight. Through encounters with the arts, we develop acuity. We learn to discriminate increasingly fine differences and heighten our sensitivity to their significance. We thus expand our cognitive range as we come to discern more in and through works of art. The capacity to discern and the propensity to attend to such differences pays dividends in science as well. Practically undetectable differences can be significant in x-ray photographs of inner organs and outer space. The ability to discern them, the propensity to notice them, the ability to formulate and willingness to entertain questions about their significance are crucial to understanding both the images and what they represent.

Goodman's discussion of density emphasizes the capacity to differentiate. The slightest differences in certain respects make a difference to what a syntactically dense symbol is, and to what a semantically dense symbol denotes. But the capacity to discern minuscule differences is far from the whole story. To understand what and how symbols function also requires looking past differences to recognize similarities and affinities, patterns and parallels, regularities and deviations and distortions at a variety of levels of abstraction. A person who could not recognize a melody as the same when it was played on a harpsichord and a kazoo or could not recognize it when played in a major and a minor key, would lack musical discrimination, even if he had perfect pitch and could reliably tell whether two tones were the same or ever so slightly different. To understand a musical passage requires far more than being able to tell whether two sounds are the same. The acuity that encounters with the arts promote is the wide ranging ability to

recognize sameness and difference, pattern and variation, at different levels of abstraction. In a particular work, a blue may be the counterpart of a red, a piccolo trill, the counterpart of a quick step. The ability to recognize these equivalences is critical to understanding the works they belong to.

Even if in principle any difference can make a difference, it is not generally the case that every difference does make a difference. The members of every collection are alike in some respects and different in others. Most similarities and differences are utterly unimportant. Most extensions therefore are justifiably ignored. A few are worth noting. We devise category schemes for marking out the similarities and differences that we take to matter. These become our literal vocabulary, and owing to their familiarity and utility, we take them for granted. Over time, we may come to think that the world naturally divides into just these kinds. But a category scheme is a human construct for organizing the objects in a domain. One way to increase our understanding of the domain is to reorganize. Under a different scheme, hitherto unrecognized similarities and differences may be brought to light. One of the cognitive functions of the arts is to effect such reorganizations and show what they have to offer. Often they do so by means of exemplification.

Exemplification is the mode of reference by which a sample or example refers to the features it is a sample or example of.[iv] Although it is ubiquitous in the arts and sciences, exemplification has pedestrian functions as well. An exemplar -- be it a commercial sample, an abstract painting, or an experimental result -- highlights, displays, or otherwise points up some of its own features, and thereby affords epistemic access to them. A fabric swatch might exemplify a particular paisley; a painting, a swirl of sepia; an experiment, an alignment of atoms. Goodman's

discussion of exemplification is of signal importance. Not only does it remind us that samples, examples, and exemplars of all sorts function cognitively, it explains how they do so. An exemplar is not a mere instance. It is a telling instance -- an instance that brings out or points up the features it exemplifies. This is not necessarily a matter of making the features conspicuous. In science as well as art, exemplified features are often extraordinarily subtle and difficult to discern. But by manipulating, scaffolding, or framing the context, the exemplar draws attention to particular aspects of itself. Once our attention has been drawn, we start to learn how to recognize those features in other settings.

Exemplification is a vitally important feature of both art and science.[v] An experiment exemplifies the aspects of the theory it is designed to test. A painting exemplifies the forms, colors, textures and feelings it brings to the fore. Exemplars, being symbols, require interpretation. Commercial samples belong to systems where interpretation is regimented. There is little doubt about which features such a sample is a sample of. A fabric swatch exemplifies its pattern, color, texture, and weave, but not its size or shape. But not all exemplars belong to such highly regimented systems. In both the arts and the sciences there may be controversy about which aspects of a symbol exemplify, and about precisely which features they refer to.

A symbol's repleteness depends on the number of dimensions along which it functions. A relatively attenuated symbol symbolizes along comparatively few dimensions. A relatively replete symbol, along comparatively many. Goodman explicates repleteness by contrasting a Hokusai drawing with an EKG.[vi] The very same line could conceivably comprise both. But not only is the interpretation different, so are the features that bear interpretation. When the symbol functions

as an EKG, all that matters are the shape and position of the line relative to an antecedently established coordinate system. The line's color, thickness, intensity and shading play no symbolic role. Any set of points with exactly the same co-ordinates would be the same symbol, regardless of differences in other respects. But when the line is interpreted as a drawing, all these features function symbolically. Any difference in color, thickness, intensity or shading, as well as any difference in position would make for a different symbol. The EKG is relatively attenuated, the drawing is relatively replete.

Unlike the first three symptoms, which cut across art and science, relative repleteness seems to mark a disciplinary divide. In general, scientific symbols tend to be relatively attenuated, and artistic symbols relatively replete. The difference, though, is a matter of degree. There are a variety of cases that may be hard to classify. Relief maps are more replete than standard Mercator projections. Dioramas are even more replete. Although we can distinguish between more and less replete symbols, and recognize that normally the highly attenuated ones lie outside the arts and the highly replete ones lie within the arts, there is evidently no sharp line separating the disciplines. Moreover, we should not be too quick to assume that all highly attenuated symbols belong to science. Many play other roles. They function in recipes, street signs, bus schedules, and so forth.

The final symptom of the aesthetic is multiple and complex reference. Artists often deploy symbols that perform a variety of interanimating referential roles. Scientists strive to develop symbols that refer directly, univocally, and determinately. Metaphor is perhaps the most familiar mode of complex reference. When a denoting symbol is used metaphorically, Goodman maintains, it both denotes its metaphorical referent and refers via a chain of reference to its literal

referent.[vii] In the sentence ‘Phineas is a parasite’, the term ‘parasite’ both denotes Phineas and describes him. That is, it locates him within the extension comprised of metaphorical parasites, thereby marking out the extension to which he and other metaphorical parasites belong. That extension, like the extensions of many metaphors, lacks a literal label. Metaphor then is a mechanism for identifying, labeling, and indicating the utility of extensions that are otherwise semantically unmarked.[viii] The metaphor also connects Phineas via one or more chains of reference to literal parasites. Through chains consisting of denotational and exemplificational links, it highlights shared features that enable us to recognize what literal and metaphorical referents of the term have in common. Both, for example, absorb their hosts’ resources while returning nothing.[ix] Metaphors advance cognition by transgressing established categories to reveal likenesses both within and across domains -- likenesses that lack literal labels. When we recognize the truth of ‘Phineas is a parasite’ or ‘Watergate is a cancer on the presidency,’ or ‘Antibodies are the first line of defense against infection’, we learn.

Goodman’s discussion of metaphor shows how attention to the arts can advance understanding of cognition generally, and of the ways science serves cognition. Frequently, metaphors are dismissed as mere decoration.[x] If so, they are eliminable with no cognitive loss. But it is wildly implausible to think we could eliminate the metaphors in religious painting or symbolist poetry with no loss. No one, of course, would deny this. But many philosophers insist that the loss would be merely aesthetic, not cognitive. Goodman shows otherwise. Without the metaphors, these works could not advance understanding in the way that they do. By displaying the power of metaphor to reconfigure domains, to make unsuspected

connections within and across domains, to mark similarities and differences that had previously gone unnoticed, Goodman makes the case that metaphors function cognitively in the arts, that they enable us to see things in the arts and through the arts that we previously could not recognize. And by showing how metaphors in religious paintings and symbolist poems spark insights, test assumptions, and prompt recognition, it provokes reconsideration of what metaphors contribute to other disciplines. It equips us to see that political philosophy would be deprived of more than a decoration if we eliminated all talk of social contracts, and that computer science would lose more than a *façon de parler* we eliminated talk of memory, storage and retrieval.

I said earlier that scientists, unlike artists, strive for literal, univocal, determinate symbols. This is true. But we should not think that metaphors, analogies, and other indirect modes of reference are alien to science.[xi] Inasmuch as metaphor is a device for drawing new lines and for redeploying conceptual resources that have proven effective elsewhere, it is an immensely valuable tool at the cutting edge of inquiry. Where there is no literal vocabulary that marks the divisions that scientists want to recognize, they resort to speaking metaphorically of strings or black holes or central processing units. But as inquiry progresses, the talk becomes increasingly less metaphorical. Either the terminology acquires a literal, technical usage, as when, for example, astronomy explicates the notion of a black hole without reliance on what non-scientists consider black things or holes, or it replaces the metaphorical term with a new technical term, whose interpretation is specified by the theory that embeds it or the research program that uses it. Metaphors and other indirect modes of reference tend to become obsolete as a scientific research program evolves. They are central, vital, and permanent

elements of art.

Exemplification, like denotation, may be metaphorical. A symbol must instantiate the features it exemplifies, but that instantiation need not be literal. A proof might metaphorically exemplify power; a painting, pain; a beer advertisement, boorishness. Goodman argues that expression is a mode of metaphorical exemplification. A minuet that metaphorically exemplifies lightheartedness expresses lightheartedness. On Goodman's account then, what a work of art expresses is not determined by how anyone -- the artist, the actual audience, the intended audience -- feels, but by what it symbolizes and thereby affords epistemic access to. Even the expression of feelings then is not primarily a device for engendering feelings, but for referring to them.[xii]

Works of art can express things other than emotions, and works can express emotions they do not evoke. Nonetheless, it is clear that many works of art evoke emotions, and that their doing so is vital to their aesthetic function. Goodman neither denies nor belittles this point. What he denies is that the evocation of emotion is the end of art. A kick in the shins is a far more efficient way of evoking pain than composing a sonnet is. If a poet wants merely to evoke pain, he should eschew the poetry and take up mayhem. Rather than the end of art, Goodman contends, the evocation of emotions is a powerful, sometimes subtle means by which some works of art advance understanding[xiii]. Emotions reconfigure a domain, highlighting features we might otherwise overlook.[xiv] The aesthetic attitude is one of critical self reflection. By monitoring and critically assessing not only a work of art, but our reactions to it, we learn more about the work and ourselves. By attending to our own responses, for example, we may come to recognize the

difference between sorrow and melancholy, or joyfulness and glee. And having learned to tell similar emotions apart, we can now recognize them in other situations in which they arise. This in turn enables us to draw a significant distinction between those situations. If this is right, emotional reactions to works of art are often vehicles for self knowledge as well as for discerning subtle aspects of works of art. Moreover, insights we gain from and through works of art are often exportable beyond the aesthetic realm, refining and reconfiguring our understanding of ourselves, other people and other aspects of our environment.

Metaphorical exemplification occurs in science as well as in art. A model of a chemical process metaphorically exemplifies beauty; an experimental design metaphorically exemplifies elegance. These features figure in scientific assessment. They are not merely decorations. Ceteris paribus, beautiful models are scientifically better than ugly ones; elegant experiments, scientifically preferable to clumsy ones. Metaphorical exemplification in science and in art then affords epistemic access to features of symbols and thereby advances understanding of them and their functions.

There are other modes of complex reference that through the interplay of exemplification and denotation connect symbols to their referents. Some, such as variation and allusion, have fairly standardized forms. Others are more opportunistic. A particular work may effect a chain of reference whose geometry is unique.

Symbols in the arts often play several roles at once. A work, or a symbol within a work, may bear multiple, even divergent interpretations. Although such multiplicity is undesirable in the sciences, it is welcome in the arts. That it is impossible in principle to determine once and for all whether *Henry V* is a

militaristic or a pacifist work, that the salient passages read equally well whether they are construed literally or ironically, is one of the most interesting and powerful features of the play. It opens doors to insights not only about Shakespeare, and about war, but also about the powers and limitations of language. Where reference is multiple or complex, interpretation is not straightforward.

Goodman insists that the symptoms of the aesthetic, like the symptoms of a disease provide neither a definition of art, nor a decision procedure for distinguishing art from non-art. But, he notes, they

> tend to focus attention on the symbol rather than, or at least along with, what it refers to. Where we can never determine precisely just which symbol of a system we have or whether we have the same one on a separate occasion, where the referent is so elusive that properly fitting a symbol to it requires endless care, where more rather than fewer features of the symbol count, where the symbol is an instance of properties it symbolizes and may perform many interrelated simple and complex referential functions, we cannot look through the symbol to what it refers to as we do in obeying traffic lights or reading scientific texts, but must attend constantly to the symbol itself.[xv]

But that symbol, Goodman maintains, sheds insight beyond itself, calling into question the complacent assumptions of untutored common sense, revealing features to be found in other aspects of experience. Art, on Goodman's view, is not insular.

Scientific symbols, on the other hand strive for transparency. They seek to serve as clear windows through which we can see their referents plain. They never wholly succeed. No medium is entirely transparent. Every window has a frame.

Still, there is a difference in degree. But scientific symbols too call into question the deliverances of common sense, and reveal features to be found outside the lab.

A central tenet of *Ways of Worldmaking*, indeed a central commitment of Goodman's philosophy, is that understanding exhibits a double dependence on symbols and referents, but that there is no way to factor out the contributions of each. If this is so, there is a parallel double dependence on art and science. If we ignore art, we may overlook the constitutive role of symbol systems in structuring reality. If we overlook science, we may wrongly conclude that there are no constraints on the ways we can rightly take reality to be. To avoid these errors, to wend our way successfully between the Scylla of scientific realism and the Charybdis of postmodernism, we need to understand art and science, and to view the world(s?) through the lenses that art and science provide.

Notes

i Nelson Goodman, *Ways of Worldmaking,* (Indianapolis: Hackett, 1978), p. 102, italics mine.
ii Nelson Goodman, *Languages of Art,* (Indianapolis: Hackett, 1968), pp. 127-224.
iii Goodman, *Ways of Worldmaking,* pp. 67-68.
iv Goodman, *Languages of Art,* pp. 52-98.
v Catherine Z. Elgin, *Considered Judgment,* (Princeton: Princeton University Press, 1996), pp. 170-183.
vi Goodman, *Languages of Art,* p. 229.
vii Goodman, *Languages of Art,* pp. 68-85 and Nelson Goodman, *Of Mind and Other Matters,* (Cambridge, Massachusetts: Harvard University Press, 1983), pp 71-77.
viii See Sam Glucksberg and Boas Keyser, 'Understanding Metaphorical Comparisons: Beyond Similarity," *Psychological Review* 97, (1990), pp. 3-18.
ix See Catherine Z. Elgin, *With Reference to Reference,* (Indianapolis: Hackett, 1983), pp. 146-154.
xSee Donald Davidson, 'What Metaphors Mean,' *On Metaphor,* edited by Sheldon Sacks (Chicago: University of Chicago Press, 1978), pp. 29-45.
xi Elgin, *Considered Judgment,* pp. 196-204.
xii Goodman, *Languages of Art*, pp. 85-99.
xiii Goodman, *Languages of Art,* pp. 248-252.
xiv Elgin, *Considered Judgment*, pp. 196-204.
xv Goodman, *Ways of Worldmaking,*, p. 69.