

Philosophy revisited: 8 Great Memes

by Kate Jones

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Martin Gardner has inspired me in more than one area of my intellectual life: through his writings on mathematical recreations—puzzles—and his personal soul trek, *The Whys of a Philosophical Scrivener*.

The types of puzzles Martin popularized in his *Scientific American* columns, notably pentominoes and MacMahon's three-color squares, led directly to my now evidently life-long career of creating, designing, developing and making “gamepuzzles for the joy of thinking”—going on 29 years at the time of the G4G8. Solomon Golomb, the “patriarch of polyominoes,” and Arthur C. Clarke, with *Imperial Earth*, are the shoulders I stand on. A permanent tribute to the late Sir Arthur is in my website, gamepuzzles.com.

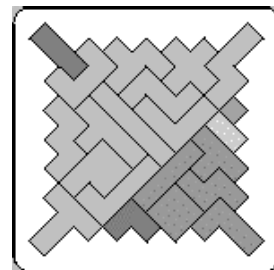
In a previous article, “Combinatorial Philosophy” (2004), I described how such puzzles can serve as paradigms for theories of “all there is.” On the occasion of the 7th Gathering for Gardner in 2006, in a brief talk I listed, appropriately enough, seven philosophical principles that could be derived from such playthings of the mind.

Ideas held in the mind are little bits of software. Richard Dawkins, evolutionary biologist, philosopher, and author of *The Selfish Gene* and other scientific bestsellers, has proposed the word “meme” as a building block for beliefs, concepts and ideas, parallel to “genes” as building blocks of the physical body.

And just as genes can aggregate into hugely complex organisms, so memes can propagate themselves into gigantic and pervasive networks that take on a life of their own and are just as selfish as the genes and maybe even more so. After all, some memes can even destroy their own host, and the host's genes as well, for example in acts of fanatical excess.

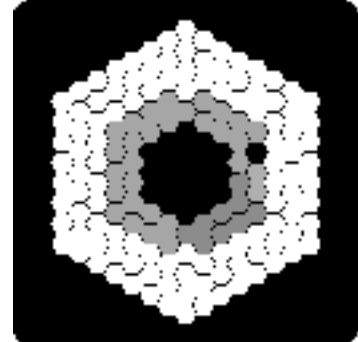
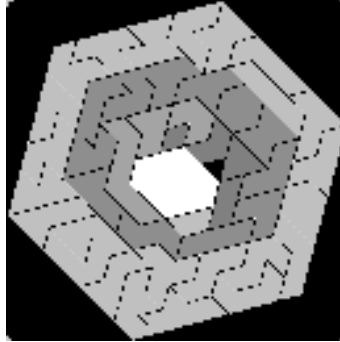
I herewith offer 8 memes that play a valuable part in the preservation and furtherance of humanity, and they can be seen metaphorically in the various combinatorial puzzle sets I've published. Here goes:

1. There is one objective Reality and everything is a part of it. It is what it is. It's the full set, the whole kit. Honestly. No cheating. Our brains are part of it, too, so we can figure it out. And someday we can figure out our brains, too.



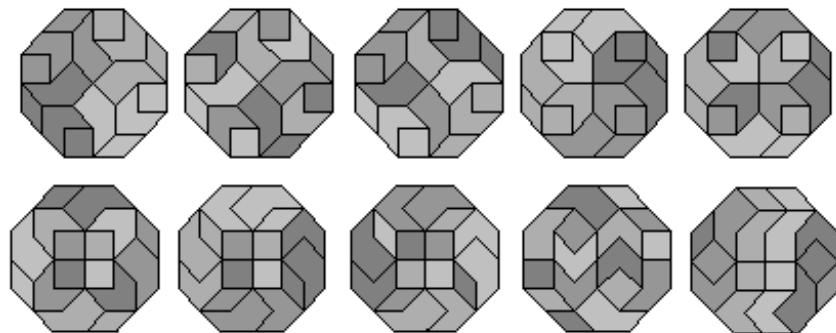
Consciousness and self-consciousness are evolving properties. Here are the polyominoes 1 through 5 (our “Poly-5” set), starting from the singularity and growing unpredictably (caused sequentially but not foreordained) with each new element added. We can identify them, derive them, combine them, rearrange them, solve countless special combinations.

At right are the polyiamonds (shapes made of 1 through 7 joined equilateral triangles) and the polyhexes, sizes 1 through 5 hexagons joined). All these are the “full set,” but open to be expanded to the next order, and to the next, potentially growing with no limits, and solvable in ways



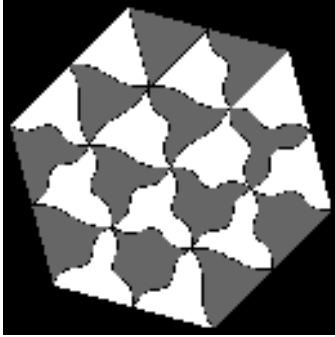
beyond count. All these are “robust systems,” as Jerry Sussman’s talk described, with “body plans” that hold their shape yet can also build different shapes. This dynamic applies as well to ideas as to puzzle sets. As in Caspar Schwabe’s transforming “Jitterbugs” and Thomas Hull’s “Modular Origami,” pieces (and ideas) can lock together yet create multiple patterns and structures. That brings us to the next point:

2. There is more than one right answer and we can find them, even if we have to program a computer to search out every possibility. We can delight in the multitude of choices, the freedom of having many options, making our own rules, our safeguard against totalitarianism. Like a kaleidoscope, every composition surprises with its loveliness—its uniqueness in diversity, its hints of optical illusion. Just so, every individual human being is a different answer to what it means to be human. Each person’s ideas form a panoply of conceptual composites, some illusions, some delusions, some maps that match our own. Here are just a few of the multitude of variations with our Rombix Jr. set, based on Alan Schoen’s rhombic dissections of an octagon:



3. We can know the difference between reality, imagination, representation, and not take others’ word for anything uncritically. Humans are unique in being able to make pictures of the things around them, and symbolic images of ideas, encoding these in art, language, mathematical symbols, metaphors, gestures. We speak to each other of the objects and experiences in the real world, and record them inventively in our artifacts.

(Beware of reports that morph into accepted myths, like Peter Lamont’s debunked Chinese rope trick story.) We can even make symbols for real and imaginary numbers... We can also imagine impossible objects and even draw pictures of them. It may well be that anything we can imagine or conceive could become real, but even children learn the difference early between real and “make-believe”; we can know the difference between



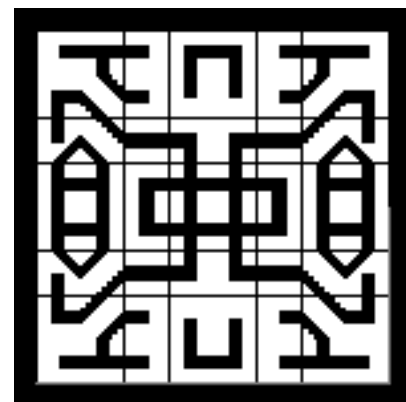
being and becoming, between the real world and a potentiality. Here’s an example of these points, our Trifolia set. We posit equilateral triangles, transform them with every permutation of wavy, convex and concave edges, and find that in the real world that gives exactly 24 unique tiles. We can make these as solid objects, or put recognizable pictures of them on paper or a computer screen, and then ask how many ways to fit them into a hexagon (or other shapes). I have it on the good authority of Toby Gottfried and his trusty computer program that there are indeed over 2.3

million solutions, and I believe him. Absent a print-out for empirical verification, those solutions exist in the real world only as a potentiality not to be confused with the physically existent. Philosophers do get confused over these hair-splittings.

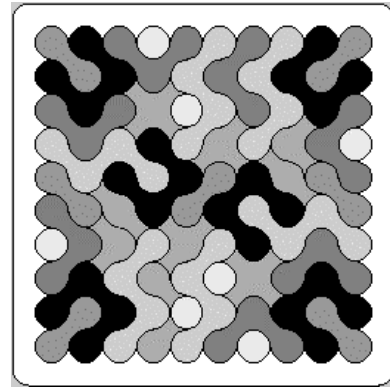
4. There is a continuum between polar opposites. It is not an all-or-nothing world. Depending on what we want or need, we can locate any point along the continuum. The extremes pull toward either totalitarian endpoint. Between them is a scale to which we can assign values. Values are reducible to what serves life and happiness, and that may vary with each individual, though in many areas we have considerable congruence. The midpoint of balance is the much-vaunted golden mean, the happy medium, the still and peaceful center where all conflicts are neutralized—a system where individuals are free to move to their own best level, thus assuring the maximum happiness of all. Here is Alan Schoen’s Rombix, with 16 all-different tiles, where all colors can be grouped or separated or any two made congruent, and 523,442 solutions formed with every mix in between, still maintaining equilibrium among the parts.



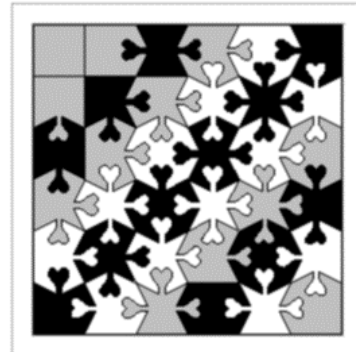
5. Change is beautiful, as transformation reveals new possibilities, transcends previous limits. It draws on the best of our creativity, provides the excitement of new explorations, new discoveries. We find new syntheses, new combinations, and a lovely harmony in diversity. Change need not be chaotic and disruptive—intelligent human design enriches all. This tiling set, DeZign-8, with 8 types of tiles, can form from one to 19 separate networks of paths, from symmetric to random. Each new pattern is a joy for the discoverer.



6. Achievement feels good. The mind craves to be used towards a purpose, it wants to learn and to fill the unforgiving minute with 60 seconds' worth of distance run. It wants to do intelligent design, to have purpose for every action and an action for every purpose. Pursuing an objective puts you in the flow, lets you be all you can be, whether solving math problems, curing diseases, putting a man on Mars, or inventing puzzles. It takes persistence to get that a-ha moment. When it reaches a self-validated goal, the mind is happy, and its owner feels good. Failure rankles. Doing "wrong" twinges the conscience. Watch what goals you accept as "good." All the purveyors of self-esteem boosters can't come close to what rational achievement gives. Super Roundominoes is one of my most difficult designs. Finding *any* solution for it is an endorphine machine. But I also acknowledge that solving a puzzle is no substitute for real-world accomplishments, and there I stand in awe of what you folks have done in your lives.



7. We can make things fit. This is where puzzles are the best paradigm, because one of the first directives of life is to figure out what to do, from the practical to the ethical, from the behavioral to the technical. We derive criteria, resolve conflicts, learn to fit in, develop taxonomies, define justice, untangle knots (thank you, Slavik Jablan!) and paradoxes (thank you, Raymond Smullyan!), recognize basic needs and values, choose what most conduces to our personal balance or comfort level in the multiplexity of competing ideas around us. We are virtually aswim in a sea of memes all vying for primacy in our minds and lives. Even when we think we are free from outside control, we're being controlled from within, by all the ideas that have taken up residence in our cognitive and emotional programs. If we look, we can see how all the pieces fit. We can even rearrange them for a better fit. That's what the scientific method does. The memes want to make things fit, too, and they'll do it by hook or crook, by rationalization if reason falls short. The antidote: frequent reality checks. *Shown:* Snowflake Super Square, one of our most complicated-looking puzzles, interlocked yet universally reconnectable. Just so, we recombine ideas.



8. We can make things better. The problem-solving faculty of the human brain is the crown jewel of evolution. We can reason things out. One of the mind's prime directives is to guard and nurture, preserve and expand, to correct itself on new evidence, because it's more important to BE right than to be thought right. And it's by comparing as many ideas as we can among other thinking people that we can get closer and closer to a true understanding, a better and better picture of Reality and what it takes to make lives better. Identifying the good memes is part of that. I offer you these 8 for this year. I may have another one to add in 2010. Thank you.

—Kate Jones, www.gamepuzzles.com