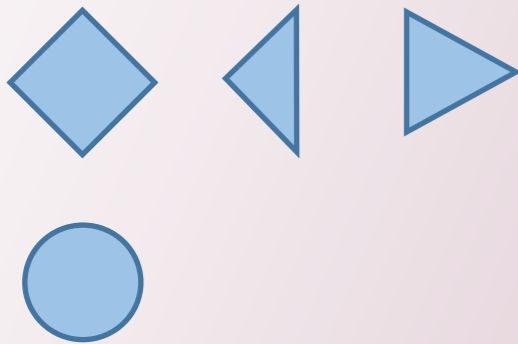


# The Beauty of Self-Referential Science

## The Science of Forms

We may think of the whole of science as the process of refining everyday thinking. Given that the whole of science is self-referential and that mathematics underlies the whole of science, mathematics must be a form of science, the science of forms. So conceived, the reason of mathematics includes not only logic but also the beauty that emerges from removing waste from deciding well in the pursuit of living well. Consider the following test of reasoning:



Given the pattern of geometric forms in the top row, what are the second and third forms in the bottom row? There are at least six solutions to this problem. Which of them ought we to choose? From the view of the science of forms, we ought to choose all forms that best help us decide well in the pursuit of living well. The timeless end of this science is the set of all forms that are best in helping us to decide well in the pursuit of living well. We can never formally prove that any form is a member of this ideal set. However, we can empirically disprove that it is by finding more useful forms in living well.

The second row's object may be a polygon with a finite number of sides, a polygon with an infinite number of sides, or a circle. Each of these three has two solutions. The circle solutions are (left-handed semicircle, circle) and (circle, circle). Given the first object is a circle, what would be your solution if this problem had only the first two objects in the top row? What does this say about you? Do you reason based on formal logic, Alfred North Whitehead's process philosophy, or the science of science? *Are you simple-minded, muddle-headed, or wise?*

## Refining Everyday Thinking

In the culmination of [the thirteen-episode BBC science series \*The Ascent of Man\*](#), Jacob Bronowski described what John von Neumann sought in his [unfinished mathematics of reason](#) as "a procedure, as a grand overall way of life—what in the humanities we would call a system of values." To finish his study of reason, von Neumann needed to expand his theory of games into the realm of grand strategy, into a game in which people choose whether to cooperate in deciding well in the pursuit of living well. He needed to study [what Albert Einstein called the whole of science](#) as the self-referential process of refining everyday thinking.

The idea of self-referential science as a means of living well is an ancient one. In [Charmides](#), Plato put forth the idea of the science of science as the best means of developing *sophrosyne*, the Greek virtue of soundness of mind and excellence in character. However, he saw two problems with this idea. First, it requires knowing something about what we do not know, which appears to be a logical contradiction. Second, it may be too idealistic to be useful in living well. The solution to both problems is to recognize that reason calls not only for logic but also for the beauty that emerges from removing waste (wasted non-knowledge resources) from the process of deciding well in the pursuit of living well. Because using knowledge does not use it up, deciding well in the natural pursuit of living well calls for replacing non-knowledge resources with knowledge resources.

The problem of deciding well in the pursuit of living well is overwhelmingly complex. We best address it by breaking its timeless end (Wisdom) into the pursuits of inexhaustible, universally useful factors of Wisdom, which we may think of as timeless values. Among these values are the timeless ends of living well (Happiness), believing well (Truth), contemplating well (Beauty), governing ourselves well (Justice), and competing well (Winning). Pursuing any one of these values calls for us to decide well, which in turn calls for us to pursue all the others. This system of values provides us with a means of refining our belief systems. In doing so, we refine our sense of natural beauty, of what "rings true" with all we currently know about deciding well in the natural pursuit of living well. To learn more about this concept of beauty based on a formally reasonable direction to cultural evolution, go to [www.boundless-reason.com](http://www.boundless-reason.com).

## Shifting the Paradigm Paradigm

Science is subject to revolutions in conceptual frameworks. Thomas Kuhn likened these to a drawing designed to let people see one thing or another but not both at the same time, e.g., the trick drawing of a duck and a rabbit. Changing Einstein's whole of science from the *products* to the *process* of refining everyday thinking is no ordinary paradigm shift. It calls for training ourselves to assemble facets of deciding well into a whole. We may liken this to learning to see the 3D image in an autostereogram. The resulting belief system structure helps us "see" (imagine) what lies behind and beyond reductionist models of the world we use to solve given problems. It helps us to find holes as well as contradictions in our belief systems.

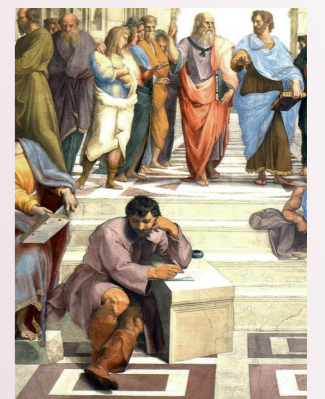


Autostereogram by 3dimka. <<http://3dimka.deviantart.com/art/Africa-3D-Stereogram-35292507>> (30 December 2020)

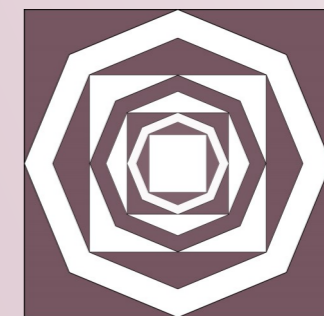
## Renascent Art

The [decoration of the Stanza della Segnatura](#) portrays a strategy for bringing ever more (Holy) Wisdom into the world. The original design for the [philosophy wall](#) did not include the massive figure of Heraclitus contemplating the concentric square tile pattern at his feet. Raphael added it after completing the fresco as planned. What problem does pure rationality raise in the mind of this brooding lover of Wisdom who famously claimed that we cannot step into the same river twice? *Deciding well calls for a form of reason that includes Platonic beauty as well as Aristotelian logic.*

Supporting this claim, the two-point perspective of the block on which Heraclitus writes conflicts with the planned fresco's one-point perspective. This addition changed a depiction of the world into an instrumental (pragmatic) model of deciding well in the pursuit of living well.



Further supporting this claim, the Heraclitus figure links the concentric square tile pattern beneath his feet to the square-in-an-octagon-in-a-square tile pattern slightly above his head. We can easily imagine replacing each of the squares in the lower pattern with the upper pattern. Compare the resulting image to da Vinci's *Vitruvian Man*:



The image on the left represents the *philosophy* of Plato and Aristotle; the one on the right the *sophistry* of Protagoras and Vitruvius. Both are symbols of the reason of squaring the circle. The left renders endless renaissance; the right depicts the cause of our modern confusion of ends.