The Making of a Logo

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The request

My friend Solus “Sol” Simkin has a well-earned reputation as a Renaissance man. Among other things, he is a virtuoso of design. He endows his creations with an air of ethereal perfection—where mathematics meets aesthetics—to transmogrify the mundane or banal into unforgettable works of art.

Some weeks ago, he was approached by—of all establishments—a firm of consulting philosophers, who wanted to brand their practice with a logo. They wanted something impressive, memorable, and easily recognized as pertaining to philosophy. They left the details to him, emphatically observing that they did not want their personal biases to colour their logo (pun intended). Image, icon, shield, or plain text: the choice of logo was his.

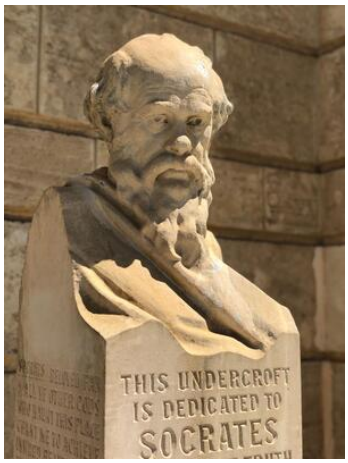
The quest

This unusual request sent the cogwheels in Sol’s brain whirring furiously as he imagined the logo from different design standpoints. He swept through, in fast motion in his mind, a myriad of options, only some of which I have chronicled here.

Socrates and Diotima

He first thought of the philosophers Socrates and Diotima whose words had earned his undying admiration. He recalled his visit to Athens just before the 2004 summer Olympics, when he had marvelled that such noble thoughts could arise from such ancient minds!

But would a layperson recognize those statues and make the link? He thought not, in these days of frenetic and fading fashions and fads, which came and went faster than the famed fruitfly, Drosophila melanogaster. Why, most people would not even recognize their own national flags nowadays, let alone intellectual icons from the past.



Socrates

Diotima

A syllogism in symbols

Mathematics and philosophy are the two excursions of the human mind that naturally run closest to each other. Why not then a syllogism expressed in the austere symbols of mathematics?

$$\begin{aligned} a &\implies b \\ b &\implies c \\ \therefore\ a &\implies c \end{aligned}$$

He then pondered the legions of people who had made the compulsory bittersweet acquaintance with mathematics, forced upon them in elementary school, and forever forsworn thereafter. No, an expression of mathematical logic was not a good idea: it would either evoke painful memories, or be passed over in utter incomprehension.

Knots and Braids

Mathematics and philosophy share another quality. Two related branches of mathematics, Knot Theory and Braid Theory, are devoted to knots and braids. Philosophy too, generally grapples with the knotty problems of life. He thought about the simple trefoil knot, stylized as the Celtic triquetra, and of the more complex braids, and their logic-defying symmetry. Here was something symmetrical, beautiful, engaging, intriguing, mathematical, and philosophical, all at the same time. Surely, that would nail the design.

But after he slept on the idea, it struck him as too vague: how would one know which aspect of the braid was being alluded to? What if someone thought of it as, say, the logo of a Society of Druids? Too many ifs and buts obfuscated what had initially seemed an inspired choice.

Popper and falsifiability

Sol then turned his attention to science. Karl Popper, who was one of the twentieth century's celebrated philosophers of science, came to mind. He had promulgated a principle that has its roots in mathematics.

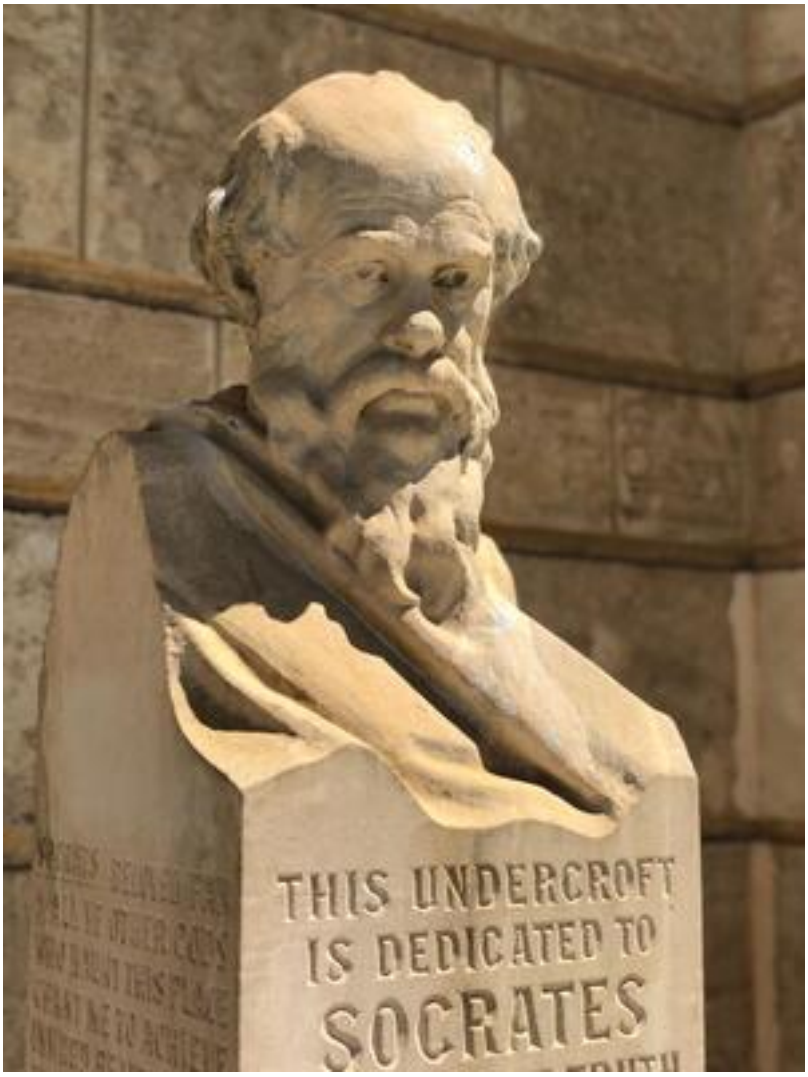


Figure 2: Socrates

Figure 3: Diotima

Trefoil Braid

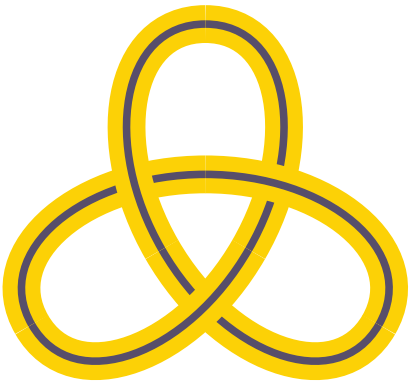


Figure 5: Trefoil

It is not possible to *prove* Pythagoras's Theorem simply by showing that it has held water in a million cases. But a *single counterexample* disproving it would be sufficient to knock it off its perch on the pedestal of mathematical truth. Thankfully, that is not the case. The famed theorem has been proved by methods that are mathematically rigorous, and it will therefore stand the test of time. Period. No questions.

Unlike mathematics though, science is built upon the interplay between theory and experiment. There is no neat, logical way in which the "truth" of a theory may be proved. And again, a zillion experiments upholding the predictions of a theory do not necessarily prove its correctness. But the results of a *single* experiment that contradicts the theory is enough to undermine it wholesale.

This asymmetry on the onus of proof in science is at the heart of the Criterion of Falsifiability put forward by Popper.

Figure 6: Braid

He held that a scientific theory could never be pronounced correct even if it explained Nature countless times; but a single instance of its failure would suffice to prove its inadequacy. Popper's premise was that any theory that claimed the least pretence to be scientific must provide an experimentally falsifiable prediction that could be settled conclusively by an experiment.

But this foundational principle of science has now been called into question by String Theory, which is a relative newcomer to theoretical physics, but one that has captured the common imagination, judging by the popular explanations that abound on the Web [1–3]. And whether string theory is or is not science, Popper notwithstanding, is an issue that is still up for debate [4–7].

But, coming back to the task at hand, how would such an abstract idea as falsifiability find expression in a logo? Perhaps the correct medium for it would be a comic strip, but alas, comics do not a logo make.

Kuhn and paradigm shifts

Sol racked his brain for more ideas when he suddenly stumbled upon the half-remembered phrase paradigm shift coined by Thomas Kuhn—another celebrated philosopher of science—and popularized in his enduring tome, *The Structure of Scientific Revolutions* [8]. Kuhn held that science did not evolve smoothly, but every so often experienced seismic corrections or radical changes of perspective that led to new theories that predicted the world much better than before. But how in heaven was he to squeeze all that into a logo? And wouldn't that narrow it to the philosophy of science rather than to all of philosophy? Sol rued that he had entered another cul-de-sac on the road to a viable design.

The dream

It was now two weeks since he had been commissioned to work on the logo, and Sol did not have even a single draft design to show for that time. He feared that he was losing his famed mojo that had landed a winner with each project. Weary and teary after much squinting at screens and books, exhausted in body and mind, and a little apprehensive, he fell into a deep slumber.

When he awoke refreshed, Sol had a clear recollection of a dream—or was it a reverie—in which he had met a man who had mouthed something that sounded foreign, but he was hard pressed to identify what pearls of wisdom had been uttered.

Thankfully, the man's face was etched in Sol's mind. And what a face! A head with a shock of dark hair that fell to his shoulders, a sharp nose, and a pair of piercing, knowing eyes that paradoxically had a dreamy look as well. His mouth was framed by a sparse moustache and a Van Dyke beard. It was a face vaguely familiar, yet tantalizingly out of recollection's reach.

Rather than fret and fume at not remembering the words in his dream, Sol decided to let the matter rest. He was on an earnest quest, conducted at his own pace, relaxed and without panic, but not so relaxed that the image faded from his mind's eye. ☺

The search for a face

While he was working on an unrelated task, the thought suddenly flashed in Sol's mind that he should harness the Web to see if there was any gallery of portraits of well-known philosophers against whom he could attempt a match with the face seen in his dream. It seemed like a hopeless task, but it was the sole lead he had.

A cursory search of the Web gave no comfort. The hair-style of the man in his dream definitely ruled out the Wittgensteins and Kierkegaards.

He decided to search among the likes of Leibniz and Newton, both of whom were not only celebrated philosophers of their time, but also sported long locks, whether natural or wigged. But no luck there either. Their eyes appeared too different from those in his dream.

Since both Leibniz and Newton were renowned mathematicians as well, Sol got side-tracked thinking about whether the calculus was discovered or invented.[1] It was probably the greatest scientific advance of its time. And priority for its discovery was an ugly bone of contention between Leibniz and Newton [9].

And then it hit him like a ton of bricks. *Calculus could not have been invented without coordinate geometry—that extraordinary offspring of the fortuitous marriage of geometry and algebra.* And the progenitor of *that* wunderkind was René Descartes. With bated breath, Sol searched the Web for images of René Descartes.

And bingo! he had a gallery full of faces that were remarkably similar to the image of his reverie, with eyes that were piercing and dreamy at the same time.

René Descartes

Relieved that at last he was on the scent, Sol relaxed for a couple of days, which he spent reading about the life of Descartes [10]. He chuckled when he read that "the 22-year-old [Queen] Christina [of Sweden] perversely made the 53-year-old Descartes rise before 5:00 am to give her philosophy lessons, even though she knew of his habit of lying in bed until 11 o'clock in the morning." [10]. He read with chagrin that Descartes tragically died in Sweden from pneumonia, presumably caused by the Scandinavian winter and the duress of having to rise early in the morning to keep his appointment with his royal student.

Sol foraged for anything that could throw light—like Newton's falling apple—on how Descartes got his primary insight of superimposing an orthogonal grid on the plane, to tame geometry with algebra. He could not unearth much and decided to pursue that query for when he did not have a deadline to meet. For now, he needed ideas for a logo, and time was fast racing past.

The epiphany

Sol pondered the tragic death of Descartes, and whether *it* held the clue to the deep philosophical truth that he was after. And then the elephant in the room popped into view. Why did Descartes, a Frenchman who lived for long in the Netherlands, die in Sweden? Because he had gone to teach *philosophy* to Queen Christina; not mathematics but philosophy.

[1] Such meandering, away from the straight and narrow of his specified task, endowed his designs with a resplendent intellectual sheen, but took its toll on timeliness.

Figure 7: René Descartes (after Frans Hals, Public domain, via Wikimedia Commons)

And what was Descartes' most profound philosophical utterance? Oh! Of course! Cogito, ergo sum: "I think, therefore I am". And there he had it: the muted words of his dream, and the nucleus of the logo he had been asked to design.

The means

The thrill of the quest was now over. It was time to sit down and flesh out a logo from a dream. Sol was no stranger to ardour. He hunkered down and sifted through his options.

Hand-crafting the logo

He could hand-paint the logo electronically, giving it unique individuality. But Sol was no natural artist and looked askance at scribing away on a tablet to artistic perfection.

Moreover, what would happen if his clients wanted to rejuvenate their logo after a few years. The metamorphosis of the 3M Logo across almost a century was a case in point. Its changes struck a fine balance between the old and the new—same enough to be recognizable from the past but new enough to attract and engage afresh. A hand-painted logo would be difficult to morph over time to retain its essence while renewing its expression. Logo-maintenance precluded a hand-drawn logo.

Interactive graphics

Having settled for a formal font-based logo, Sol still had a choice of rendering it using software that allowed one to work on a canvas, just like a painter. Examples of freely available software like Gimp and Inkscape came readily to mind.

Their primary advantage was their interactivity which gave almost instantaneous visual feedback of what was being drawn. And their basic features were easy to master and held the allure of quick and easy results.

The downside was that the results were not precisely repeatable because objects were edited and located by hand, even if their features were mathematically defined. One could manually tweak the control points on a Bezier curve until one's aesthetic sense was fully satisfied. But, being hand-drawn, they could not be repeated except through a `copy` function in the software.

Programmatic generation

Generating digital graphics by programming was a slower, more tedious process that called for ample patience. Only those conversant with delayed gratification would opt for it. The feedback would neither be instantaneous nor visual. One needed to edit-compile-view, and re-edit, repeating this cycle until satisfied. Sol pondered the tedium that awaited him if he chose to go this way.

But the upside was the precision of a coded program. Numbers reigned supreme. Small changes simply meant tweaking a digit here or there. Changing colours was a cinch. In keeping with the accomplishments of Descartes, it was the perfect marriage of art and science, of philosophy and mathematics.

Making a choice

The dichotomy of choice between interactive and programmatic generation of graphics was easily resolved though. Sol only had to think of giving his clients variants of a single thematic logo to choose from, or of the maintenance of the logo over time, through change of font, etc. It was clear that present pain bought future gain if he chose to *program* the logo.

Given that his logo would consist principally of words, Sol veered toward the TeX-based suite of typesetting tools. He finally settled upon the LaTeX format and the XeTeX typesetting engine which gave him XeLaTeX. He decided that his output would be in PDF for paper and SVG for the Web, both of which afforded resolution-independent scalable graphics that would not degrade with resizing of the output medium, whether paper or screen. With these choices made, he rolled up his sleeves for a spot of work.

The ideation

With all the preliminaries in place, Sol settled down to work. He used his prodigious powers of visualization to create the logo out of thin air using the magic cells in his brain.

Shape

He first thought of shape and decided on a rectangle to house the words. It would feature a small definitive border that emphasized the inside and framed the work. Although it takes us ahead of ourselves in this account, he later fell for the symmetry of a circle as his prime choice.

Font

Sol had a preference for sans serif fonts as they could float ethereally and occupy space anywhere. They were largely context-free and suited to headlines, hoardings, captions, logos, etc. But each time he visualized the three words of the logo, something felt out of place.

In resignation, he fielded a serif font and suddenly things seemed hunky dory. Never one to accept a matter as settled without due cogitation, he pondered why. Then he remembered that serif fonts arose from a time when Latin writing was sculpted on stone. The chisel and hammer made it difficult to carve out characters without serifs as some little sliver of stone stubbornly decided to break, not at the prescribed right angle but at some other odd angle. Serifs were introduced to smooth over such imperfections, and in time came to hold their own as a style for a font face.

And since Descartes' words were in Latin, what better way to celebrate their Latin-ness than with serifs? So, he chose a font with serifs. Which font in particular would be decided later.[2]

[2] His choice was usurped again, this time by a sans serif font, as we shall see later.

Symmetry

The sense of fine balance that so perfectly characterized Sol's designs urged him to split the words into three levels, representing the ground, mezzanine, and first floors. In other words, all three words in one line would not make for a memorable logo. There should be some vertical separation for greater impact. Symmetry itself would be embodied by capitalizing each word. It only remained to see where the symmetry would be broken and by which word. He decided he would cross that bridge when he came to it.

Colour

Colour is linked to emotion. Indeed one is red with rage and green with envy because of this connection. Sol did not have any colour scheme to persuade his clients to accept; he decided instead to show them a decent set of harmonized palettes and let them decide. The colours would talk, emphasize, and sell. But the colours would be chosen by his clients.

The execution

At last, Sol had reached the tedious portion of his work. Gone was the thrill of the chase. Gone the freedom to meander into byways of knowledge pretending it was all in a day's work. Gone the brain-wracking questions about what characterized philosophy. Everything had been reduced to three words in Latin: "Cogito, ergo sum", literally, "I think, therefore, I am". All that remained was to typeset them memorably and with precision.

The first cut

Sol's first cut had its operative code in this fragment which I reproduce below without explanation, simply to convey the flavour of the process.

```
%
% negative kern value
\newlength{\overlap}\setlength{\overlap}{-0.4em}%
% vertical box raising/lowering
\newlength{\moveup}\setlength{\moveup}{0.2em}%
%
\newsavebox{\CESBox}%
\sbox{\CESBox}{%
{\textcolor{word}{Cogito}}% First word
%
\hspace*{\overlap}\raisebox{-\moveup}%
{\textcolor{emphatic}{Ergo}}% Second word
%
\hspace*{\overlap}\raisebox{-2\moveup}%
{\textcolor{word}{Sum}}% Third word
}%
%
```


The above incantation, used with the Noto Serif font, gave birth to this image:

Figure 8: Logo: the first cut

The second and third cuts

The word *Ergo* appeared on top of *Cogito* and that was well and good. But *Sum* overwrote *Ergo* and that seemed a bit jarring, even if it accorded with ascending or descending steps.

But something else struck Sol even more. The progression of ideas was not reflected in the positions of the words. In logic, one starts with a proposition and ends with a conclusion or inference. The *ascent* of successive words seemed a better expression of this logical progression from thinking to being.

He also wanted to emphasize the theme with a gradual whitening or blackening of the colours of the words. That would emphasize the idea of monotonic change. But as always, colours were a finicky, context-sensitive bunch. Background, foreground, and contrast would hold final sway. After experimenting for half a day, Sol settled on the logo shown below:

Figure 9: Logo: the second cut

He stared at this version long and hard and felt satisfied, but not fully. There was a nagging sense of incompleteness hanging over the logo like a pall of smoke. He wanted to go back and start from scratch again, but his deadline was fast looming. He could make small changes, but could never hope to start over.

The Interlude

He sat down with a sigh and relaxed into a particularly worn out but comfy beanbag. It had been his muse when he sought inspiration. His refuge when he sought solace. His fortress when he needed protection. His alter-ego when he wished to bounce thoughts or simply slide into hypnagogia.

After a half hour of rest, he saw what was needed. Some form of balance on either side of the centre line that dissected the logo into two: left and right. He fiddled with the keyboard on the computer and finally settled on his third, and possibly final cut, shown below:

Figure 10: Logo: the third cut

It was not perfect but it had *some* symmetry, *some* gradation in colour to invoke a theme, *some* changes in level to connote a logical progression. *Some* of everything: some but not enough. And he went to his thinking-beanbag and closed his eyes in rumination. By Jove, perfect symmetry in the plane comes with the circle. A logo on a circle with the colours leading one to the other. That would be a logo worthy of philosophers.

The penultimate and final cuts

Sol first tried to place the three words *on* the circumference of a circle to follow its even curvature. But the number of letters in each word, namely, six, four, and three, did not make for a symmetrical break, try how he might. His eyes sought a symmetry that simply was not there. But his heart was set on the circle and its symmetry; the linear arrangement had lost its charm.

With renewed gusto, Sol placed the three words on top of each other on a coloured annulus formed by two concentric circles. At last, he was vaguely satisfied. But again, something was amiss. The circular background did not match the mixture of uppercase and lowercase letters. Somehow, gravity, dignity, or seriousness was lacking. First-letter capitalization upset the symmetry. And all-uppercase or all-lowercase versions were ghastly to his gaze. So, he turned to small capitals in the serif family, and got a result that was more than half pleasing:

Figure 11: Logo: the penultimate cut

For the sheer heck of it, he simply inserted three extra words in his code, to see how the sans serif fonts would look like in small capitals. For the record, his code is shown in full below:

```
\PassOptionsToPackage{rgb,dvipsnames,svgnames}{xcolor}
\documentclass[tikz]{standalone}
\usepackage{fontspec}
%
\setmainfont[BoldFont={* Medium}]{Noto Serif}
\setsansfont[BoldFont={* Medium}]{Noto Sans}
\setmonofont{Fira Mono}
\defaultfontfeatures{MatchLowerCase}
%
\colorlet{border}{RosyBrown!50!Black}%
\colorlet{background}{CornflowerBlue}%
\colorlet{cogito}{Black!80!}%
\colorlet{ergo}{Black!65!}%
\colorlet{sum}{Black!20!}%
%
\newcommand{\Cogito}%
{\fontsize{40}{48}\selectfont\sffamily\scshape\textcolor{cogito}}%
\newcommand{\Ergo}%
{\fontsize{40}{48}\selectfont\sffamily\scshape\textcolor{ergo}}%
\newcommand{\Sum}%
{\fontsize{40}{48}\selectfont\sffamily\scshape\textcolor{sum}}%
%
\begin{document}
\begin{tikzpicture}
\begin{scope}
\draw[color=border,fill=CornflowerBlue] (0,0) circle (4cm);
\draw[color=border,fill=white] (0,0) circle (2cm);
\end{scope}
%
\draw[color=border] (0,0) circle (2cm) node {\Ergo{ergo}};
\draw (0, 2.7) node {\Cogito{cogito}};
\draw (0, -2.7) node {\Sum{sum}};
\end{tikzpicture}
\end{document}
```

And the result, with sans serif, small capitals, without first-letter capitalization, appeared thus:

Figure 12: Logo: the final cut

Finale

As he gazed upon his latest effort, Sol experienced the exultation and closure felt at the end of a long and challenging quest. Yes, he had indeed fulfilled his commission. The last two logos were chosen for presentation to his distinguished philosophers: it was time to fix an appointment with them. But one thing was certain: he was not going to change any colours. He would let *their* biases colour their logo! And with that, he heaved a huge sigh of relief.

Illustrations

The statues of Socrates and Diotima shown in this blog are exhibited outside the Undercroft of The University of Western Australia.

Apart from highlighted code, all other illustrations were generated using XeLaTeX and applicable packages, including the TikZ-PGF suite. Much code that is freely available on the Web was accessed for guidance on typesetting these illustrations.

Feedback

Please email me your comments and corrections.

A PDF version of this article is available for download here:

https://swanlotus.netlify.app/blogs/the-making-of-a-logo.pdf

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