

Why form becomes matter

By David Spivak

Ah... so becoming.
Inspiring radiance of form:
How did you materialize here?

Consisting in resonance,
Sound in reason—
You're so well noted!

Form fits to continue.
Frustrations excising on reflection,
You arrange as conditions sustain.

Original joy of creation,
Conceived in caring contact,
Elegance effortlessly matters.

Line-by-line annotation

(With assistance from chatGPT and insights from B Scot Rousse)

0. Why form becomes matter

Each word in the title holds one of Aristotle's four causes:

- **Why** — the final cause: both *how come?* and *for what reason?* What drew this into being, and what does it serve?
- **Form** — the formal cause: the shape or structure that enables something to be what it is.
- **Becomes** — the efficient cause: the process or transformation.
- **Matter** — the material cause: the substance in which form appears.

But we'll see that the title hints at its own answer. **Form becomes matter because it is so becoming.** "Becomes" here carries a double meaning—transformation and aesthetic fit, as when we say something "is becoming on you." It fits, it suits, and because it does so, it arrives. The poem's title offers this subtle direction, to be unpacked.

Every key word in the title—and throughout the poem—has been chosen with attention to its etymology. The meanings in these lines arise not just from metaphor, but from the deep histories of the words themselves. You can count on them.

1. Ah... so becoming.

Two different lovers speak in unison. The **material lover** exhales in admiration—“*Ah, so becoming!*”—delighting in the beauty of something. At the same time, the philosopher (**wisdom lover**) rocks back in thought: “*Ah. So. Becoming. Yes yes. Let’s consider.*” The breath in this line is both enjoyment and wonder. It opens the poem with awe, insight, and the shared recognition of something that has arrived on the scene.

2. Inspiring radiance of form:

The speakers now address **form** directly. *Inspiring* picks up the breath from line 1—to *inspire* is to inhale, to be stirred. Form shines like the sun outside of Plato’s cave. The sun radiates the form of the Good, and hence the normatively good versions of everything that is. The radiance of form is active—it doesn’t just appear, it somehow reaches out. This is the moment when form invites matter to take notice.

3. How did you materialize here?

This is a question of wonder. How exactly does form “reach out”? The philosopher marvels: *how did this ideal structure arrive in the world?* The material lover adds, almost teasingly: “*How did someone like you come to a place like this?*” The line registers the surprise of presence—the way form, so often abstract, appears in matter, unannounced and undeniable. The first stanza has recalled the question addressed in the title, now asking *how* form materializes, asked in the mood of delighted fascination.

4. Consisting in resonance,

Resonance is how form consists within matter. The word *consist* means “to stand together.” In mathematics—considered the epitome of formal language and behavior—consistency is crucial: it’s a theory’s very survival. But consistency is also sensuous. The material lover knows the consistency of perfect food, the way it holds, the way it feels right. Form lives in what resounds

in the world: whatever satisfies its constraints reveals its possibilities. It consists in resonance, whether experienced in mind or mouth, over time.

In the resonance between form and matter, we encounter something akin to Plato's *Gigantomachia*—the "Battle of Gods and Giants"—from *The Sophist*. Here, the forces of form (ideal, rational, divine) and matter (real, tangible, material) are in constant negotiation. Line 4 proposes resonance as the medium through which these forces interact in a way that may often feel like conflict, but which can also be seen as a cosmic balance, a consonance, an ongoing dialogue.

5. Sound in reason—

This line fuses form's resonance with rationality, where fit and coherence lock into accord. 'Sound' is used both in the vibrational (sustained waves) and structural (correct, consistent) senses here.

In mathematics, soundness is consistency: a sound theory doesn't flip-flop; two plus two stays four. Reason—from ratio, proportioning parts—ties to the 'why' of line 0. "What's the reason form becomes? Because this is exactly what's reasonable, it's the sense in which ratios can be accordingly-proportioned." But let's check that.

Reason is proportioned fit—what stands when noise cancels. Humans and AI run on physics, so reason's root is nature at play. In humans, sensory chaos—photons, vibrations—resolves as neurons resonate and proportion inputs into order. In AI, layers of data are weighted and adjusted to proportion outputs to inputs—tuning circuits for coherence. It's the same work as a snowflake's hexagons forming—water bonds locking at 120 degrees, physics enforcing fit. Or harmony: chords sound good because strings vibrate in ratios—2:1, 3:2—sympathetic waves reinforcing each other, material guitar strings will change their vibration to lock into a chord. The hairs in our inner ear and the proteins in our retina work by vibrating at the frequency of what's around them. Our senses are sound: vibrational and structural.

So form becomes matter because matter is reasonable: it is available and amenable to ratios. Its parts align or separate to let incoherence dissipate, and what's left is sound—ratios fit exactly to their conditions. This line is the first stab at a proof of why form becomes matter.

6. You're so well noted!

Still speaking to form, the speakers express delight. The material lover grins: “Yes, I’m looking at you!” The philosopher nods: “Precisely expressed.” To be noted is to be marked, recorded, remembered—across music, mathematics, contemplation, and life. When matter takes on form, it becomes “intelligible”—susceptible to being noted—arriving in a realm of rational reflection. Notation is what allows a form to be shared, repeated, refined.

I recall a moment from graduate school, when Serge Lang exhorted me:

“The notation must be functorial with respect to the ideas!”

His statement still rings as one of the most profound I’ve ever heard. He wasn’t stating an aesthetic preference, but a demand for clarity and coherence. To express the form, the notation on the page must align with it. Constraint here is not limitation; it is fidelity that lets form show up. Lang’s articulation also echoes the aspiration of Frege’s *Begriffsschrift* and Hilbert’s *proof theory*, both seeking notation so faithful to form that reasoning itself could be written, verified, and preserved without distortion.

Fidelity also makes appreciation possible. To notate something well is to attend to it with care and precision—to let its structure be seen, preserved, and understood over time. Notation is an appreciation of form: a way of making value visible, of saying “*this is worth returning to. I wrote this so you could resonate with it too!*” The joy in this line comes from that recognition: that when form is well fitted, it can be appreciated.

However, one should be careful to consider that notation does not exhaust the form. To notate requires care—to hold something still long enough to see it clearly—but form exceeds what can be marked or rendered. Notation indicates and domesticates; it cannot capture form’s fullness. Its value lies in the reverence with which we indicate what remains beyond its edges.

7. Form fits to continue.

We use **Terrence Deacon’s** example of the flute [*Incomplete Nature*, Fig. 8.1]. A multitude of frequencies enter, but only some persist within the pipe. Those that match the shape of the instrument reflect back and reinforce themselves—they stand. The others cancel themselves out.

Form, like the standing wave, continues where it fits. This is the physics of resonance—and also the logic of life. In biology, as Darwin observed, forms that don’t fit their environment fade. What survives is what resonates—genetically, behaviorally, structurally. The behavior it sustains through interaction with the world is accepted and reinforced. Evolution, too, is a filter for fitting.

On the other hand, the material is hospitable to the fitting form. Only through sustained interaction does it become clear what forms a material can receive, and how they may be

realized. Wittgenstein might say that ideas which can't be expressed in language must remain unexpressed. So how does form continue to arise? It fits the material conditions.

8. Frustrations excised on reflection,

This line is about the act of refinement. Here, frustration does double duty: in the act of reflection, it both excises itself and excises what it cannot bring into alignment.

The mathematician reaches for the eraser, rubbing into oblivion the misaligned symbol, taking pride in careful precision. To excise is to listen more closely to form, to remove the “wrong”: the elements that disrupt coherence and fracture alignment. Just as better notation makes form more visible, excising what misaligns reveals and clarifies what does fit. Both are acts of care and discipline: refining expression until it resonates without contradiction.

But reflection is not always clean or painless. Sometimes excising means violence. The word comes from *ex-* (“out”) and *caedere* (“to cut”), and its root points to the battlefield as much as to the study. In war, nations clash in mutual frustration—and what does not yield may be cut to pieces. This is the tooth and claw of nature, red and unapologetic. In such conflict, *frustra*—Latin for “in vain”—is the result of failed fit: it lashes out and does damage to everything in its path—obstacle, instigator, and itself. The peace that follows is not without loss. This line tempers the poem’s optimism: contradiction may resolve through ratio and reason, but the process is never just abstract. The eraser takes real material. The demand for coherence costs.

Reflection here has a double meaning. It means both looking back—the reflection of a person trying to reckon with their frustration—and bouncing back—an echo, a recoil, a wave sent into conflict with itself. The monk, in stillness, catches the contradiction as it arises and stops it in its tracks. The parent who speaks too sharply may cut their tone short—or they may not. If they don’t, the mistake reverberates: a second later, or a day, or years on, they may feel what was weakened, what was cut away from the relationship. The loss can be subtle or devastating. Things can be rebuilt, perhaps—but the frustration has done its work.

Sometimes the correction comes so smoothly it feels like grace—you catch the flaw just in time, and the adjustment slides into place. Other times, you realize it too late, and the damage has already shaped what follows. Not every misfit can be removed without a scar. Still, form holds where it can, and that’s what remains.

9. You arrange as conditions sustain.

Form does not impose; it emerges where the medium permits. Matter holds what it can and nothing more. But a compelling form can arrange the matter.

The womb collects what flows through it—nutrients, warmth, time—and the form of the fetus arranges what will become a body. As I eat my tuna fish sandwich, my spirit moves into it, conspires with it: soon the material in that sandwich will be material in my living form. The sandwich arranges according to the form of me.

Identity is not static—it's resonance sustained across changing substance. Like a standing wave adjusting to its chamber, or a proof that holds across axiomatic shifts. This is how form endures: by continually taking shape in what receives it.

10. Original joy of creation,

This refers to the joy of the wave that stands, the high-five that lands, the lover received. From raw physics to human creativity, things arise not by strenuous effort, but in affirmation—in the fit that strengthens itself because it lands right. In Genesis, the creator sees what they have brought into being and declares it good. The “joy” in this line is that primordial gladness—the generosity felt in a labor of love.

Yet not all arising feels like affirmation. Schopenhauer offers a bracing counterpoint: “Willing and striving constitute [the essence of life], fully comparable to an unquenchable thirst. But the basis of all willing is need, lack, and thus pain, which is its primordial destiny by virtue of its essence.” Life, he writes, swings “like a pendulum between pain and boredom,” and even creation begins in lack. He isn't wrong: most striving fails. Much is frustrated—in the old sense of frustra—in vain. There is so much effort undone, so many forms that conditions don't sustain. But this poem is about the ones that do. When something fits—when it holds—there is a joy that wasn't willed into being and that doesn't cancel out pain at all. It simply arrives, changing the mood—the very possibilities we notice—when something real and vital comes into being.

The joy is original, not only in that it is of an ancient kind, but also in that it attends the originating of things. It is the inner gladness that comes in self-affirming formation—the clarity, the goodness, the felt rightness of fit. We love to see someone who is happy to be alive.

11. Conceived in caring contact,

Form arises through contact with something that holds and gives, with attention that cultivates. This is care—not sentiment, but responsiveness, attention, patience, trust. There is a mysterious kind of contact through which form can take hold. This is the kind of contact practiced by mathematicians, architects, and gardeners alike—where form emerges through sustained, responsive attention.

The line holds both eros—the sensual meeting that conceives—and agape—the generous letting-be that allows. Beneath both moves a subtle attraction, a tending toward coherence. This is not craving, but aspiration: the quiet motion of matter and form drawing forth their correspondence, guided by what fits. What enters the world does so through naturally-cultivated contact—contact whose nature is listening, adjusting, abiding.

12. Elegance effortlessly matters.

This line completes the poem's argument—why form becomes matter. Elegance here is not decoration or style, but a kind of fit so refined that it compels, animates, and draws matter toward it. It isn't effortful, and it doesn't require struggle to justify itself. It matters because it fits—because it coheres, and in cohering, it calls.

Elegance can be understood as an ecological harmony: a balance in which form and matter find each other naturally, like elements of an ecosystem falling into place. It is not imposed; it is emergent. Form and matter, when they cohere, are inclined to come together, to con-sist. This is the culmination of what line 5 began: the soundness of ratio, accordingly proportioned, appearing now as effortless fit. Elegance is reason made visible.

This final line also closes the arc opened in the first. Line 1—"Ah... so becoming"—is not just a response to elegance; it is already part of form becoming matter. The gasp of the material lover and the reflection of the philosopher are materializations—in their living bodies—of the form arising in them. They tell us that it is because the form is so becoming, so captivating, that it draws forth their effort. Though the form itself is immaterial, it fascinates them into attending it, and their bodies respond.

Elegance effortlessly calls forth effort. The form doesn't coerce or demand—it compels. The poet Mary Oliver once described running in from the field to capture a line of poetry before it left her. That running was not symbolic; it was embodied and active. The form she conceived moved her, in both senses of the word: she was moved by the form. This is elegance that matters: fitting what is, it calls forth the effort by which new form comes into being.