Coda. Everyone is worried that computers and AI will finally learn to do everything that's useful, and thereby make work and employment hard to find, and professions irrelevant and unnecessary. But then, what's left for you and me? I guess our destiny is to be redundant. Once this happens – maybe it already has to a few of us – we'll have to find useless things to fill our idle time. One place to look is art and design. (My list in A4 extends a little farther, to include "the humanities, the arts, physical fitness, and other subjects that don't divide things into units." Maybe I should add more – it's easy to put in literature and criticism explicitly, then fashion design, and capricious and ephemeral goals.) Wilde takes this very seriously. "All art is quite useless"–

> The only beautiful things ... are the things that do not concern us. As long as a thing is useful or necessary to us, or affects us in any [definite] way, either for pain or for pleasure, or appeals strongly to our sympathies, or is a vital part of the environment in which we live, it is outside the proper sphere of art. (*Intentions*)

Computers and AI use prior data to learn useful things or about them. (Nowadays, this would be the preferred way to define a visual analogy, solely in terms of a given "training set," without regard to von Neumann's axiomatic/verbal approach to description – a triangle is three lines, etc.) Art and design are indifferent to this; there's no prior data that computers and AI can use, and so, nothing to learn. What comes first in art is art – pictures, clouds, and tree-trunks, whenever perception is new. The trick is to see things as in themselves they really are not – things are useless when use doesn't matter and isn't a concern. (Architecture shows how this works. Delight is key as it interacts with firmness and commodity—the latter two are necessary yet for the time being, they go largely if not totally unnoticed, or noticed in a strange way.) Visual calculating in shape grammars encourages uselessness and makes it possible. In shape grammars, data is retrospective and not required to go on – in fact, it leaves no permanent trace or lasting memory. I can do what I see even if it's not what I've drawn. With embedding, things are always ambiguous and open-ended; their meaning depends entirely on how I divide them – now. Every shape is a beautiful form or a Rorschach test. Shapes aren't units or visual analogies I can store in computers or keep in my head, to recite by rote when needed. Shape grammars change useless things with useless rules. (All rules are useless, first as identities in the schema $x \rightarrow x$ or as symbols, and then because embedding makes it hard, often impossible, to tell what rules do before additional rules are tried – what happened in the past depends on what happens now.) The embed-fuse cycle pulses again and again with new perception, to make insight and imagination possible. Wilde is keen on Socialism to release this creative energy and

vitality, and to sustain it fully; today, he would embrace AI eagerly, as the logical extension of this – and Socialism with all of its administrative schemes and plans must end with AI for maximum efficiency, matchless expertise, and perfect utility. AI will do useful things, to provide free time for visual calculating in shape grammars, for art and design, for useless things not tied to data and learning, for what isn't AI – that's why the Rorschach test absorbs von Neumann. Is this truly worth fostering, or is it simply a trivial fraction in an advancing technology, an infinitesimal that will finally fade to zero? Many are resigned to the latter if not committed wholeheartedly – that sooner or later, computers and AI will reduce everyday experience to prior data and learning, to make it ever so easy to settle for the convenience and utility that this allows, for visual analogies and other descriptions to take the place of original experience that's intuitive above all. (Maybe this will be the golden age of education.) An old friend of mine is positive that AI is the open sesame to a utopian future, even as he questions Socialism and the reasons for its administrative choices and decisions. This is most likely a passing concern, as AI replaces Socialism more and more, to restore confidence and trust, and to ensure all doubts and fears disappear in coherence and opacity. AI grasps the eternal and unchangeable exactly as Plato's philosophers do, and keeps oddly silent when pressed for details of how this works and why – there are no reasons to probe. AI is simply a black box, bulging with data and statistics – "that cowardly concession to the tedious repetitions of domestic and public life." It's about numbers and measurement, and the facts and nothing but the facts – in a quest for intelligence averse to insight and imagination, and strictly banausic as a result. Reasons are for free time only, useless things for gossip and philosophy alike – it makes little if any difference. Of course, Plato presents a stark dichotomy. The unchangeable and uncertain needn't be related, in the way Socialism and AI support the creative and vital in the flux of new perception. This is an unlikely relationship at best – maybe it will work, and maybe it won't. Any relationship may put the unchangeable and uncertain at odds – even irreconcilably. Whatever the outcome, there's Plato's uncharted region of the many and variable to traverse freely, self-reliant with neither map nor guide in hand – wandering aimlessly in an endless and ever-changing maze, at constant risk of something strange or new. In these inconstant precincts and their borderless environs, the untethered (unstructured and memoryless) eye is quick to find more to see that stirs the critical spirit and excites pure delight –

> The universe increasingly has a common technology and in time may constitute one vast computer, but that will not quite be a culture. (Harold Bloom, *Shakespeare: The Invention of*

the Human)

My approach to computers and symbolic calculating has been entirely agonistic throughout my seven questions and answers. Insight and imagination subsume and exceed visual analogies (descriptions) in visual calculating, in order to bring in art and design. Computer descriptions in words, in numbers, in data and statistics, etc. limit what they describe, so that experience is final, and things (objects) are fixed and dead. Computers and AI "will not quite be a culture," as long as there's a beautiful form and the critical spirit is free to fuse and re-divide – then no description is complete or immune to re-vision. Ambiguity and new perception are rife with contradiction, discontinuity, uncertainty, and change; they put things in motion and keep them vital; they swamp AI and its store of constant data. This much is sure – in shape grammars, there's always more to see. Schemas and the rules they define hold many surprises in fickle plans and clever tricks for shapes and their retrospective relationships in graphs, hierarchies, mappings, topologies, and untold other descriptions – fleeting and forever in flux. Shape grammars work in strange and extravagant ways. They are as in themselves they really are not; they're useful (indispensable) precisely because they're useless. Shape grammars are beautiful things.

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