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# Pattern Agnosia and the Image not made by Human Hand

We regard a stone in a landscape, perhaps a piece of marble that has broken off in the quarries of Carrara. Consisting of certain minerals, it has appeared in a landscape and emerged from processes that we believe to understand through scientific method in the respective fields. Should our stone appear in an odd place or bear other anomalies, the mind of a human beholder may search for a pattern that shows whether the artifact in question is something more than the product of natural processes. Working backwards in a forensic manner we may wonder, perhaps, whether it had in fact been placed intentionally.

In his piece on abstraction and imagination in Late Antiquity,[1] John Onians finds that in the period between the first to the sixth centuries A.D., “the use of colored marble slabs [was] a characteristic feature of architecture.” Examples of such elaborately decorated spaces can be found at the church of St. Vitale in Ravenna, at St Mark's in Venice or, notably, at the Hagia Sophia  in today’s Istanbul. There are multiple explanations for the prevalence of this practice during this time in history with one being that many quarries were simply open and that marble was a particularly desirable because visually unique material. Geochemically

speaking, the ‘veins’ that visually distinguishes each piece of marble from another emerge from “various mineral impurities […] which were originally present as grains or layers in the limestone […] mobilized and recrystallized by the intense pressure and heat of the metamorphism.”[2] By virtue of the often dramatic veining of each slab, marble doubtlessly already has a certain iconic quality which, in addition to its relative preciousness as a material, was deemed suitable to adorn sacral spaces (as well as many private homes).

## THE ACHEIROPOIETIC IMAGE

Yet, some claimed to see actual representation in the patterns: “medieval and later visitors were convinced that they had seen human figures in the marble panels […] making it certain that [this] sensibility once existed.” Perhaps to amplify iconicity, two slabs were often cut and placed in a juxtaposed fashion—a practice called ‘bookmatching,’ as the resulting element can resemble the pages of an open book, which not least brings to mind the Rorschach test with its evocative ink-blots that are similarly mirrored along the vertical axis.

Bookmatched marble can indeed be found in the Hagia Sophia, although here the dominant use of marble is on the floor, which is said to have “a shimmer that when combined with undulating veining immediately evoked a frozen sea.”[3] In the view of Fabio Barry, this use of marble amounts to a “simulacrum of the church [which] fixed the image of creation in a material metaphor that literally enacted Job's [biblical] words that ‘the waters are hid as with a stone, and the face of the deep is frozen’ […] recalling the ambience of God's throne room beyond human time and out of this world.”[4] Many such uses of marble thus seem to attempt to enter us into semiotic relationship with the divine. John Onians points out that for a visitor, such as the potentially fictitious protagonist of the medieval text ‘Narratio de S.

Sophia,' it effectively takes "texts out of the realm of mere rhetorical inflation into that of real contemporary experience,"[5] potentially even forming part of rituals in which the different marble floor elements came to represent the "Four Rivers that flow out of Paradise,"[6] on which those excommunicated for their sins were supposed to stand. For the faithful, the mineral patterns in the marble might have indeed constituted an 'acheiropoetic' image—an "image not made by human hand."[7]

Regardless of one's beliefs, a shift in perception must at some point have had happened in order to recognize stone as a medium, one that generated "a body of spectators ready to recognize representations in such abstract patterns." While the Romans had still been mocking "shapes [that] are without meaning and [...] without any divine intervention," between the first and the fourth centuries A.D., the audience went "from seeing virtually nothing life-like" to "seeing something that explicitly represents a part of nature"[8]—and by extension came to see God acting through the acheiropoetic image.

APOPHENIA

Considering this active role of the beholder, Belgian biochemist and semiotician Francis Édeline (the son of artist Guillaume Édeline and one of the founders of the interdisciplinary 'Groupe μ') reminds us of the role of the subject in this iconification of patterns when he states that "to perceive is already to behave semiotically."[9] Bookmatched marble may particularly lend itself to a "synthesis of external and psychic elements,"[10] an effect that today is both clinically and commonly referred to as 'apophenia.' Coined around 1958 by neurologist and psychiatrist Klaus Conrad, the term (from Greek 'apo' [away from] + 'phaenein' [to show]) was originally intended to describe the false sense of revelation from

delusion that often comes as a symptom of schizophrenia—a sense of correlation from thin air. The external elements that Sartre refers to would typically have a level of ambivalence, or rather multivalence about them. Perhaps, patterns arranged “to suggest an infinite world of hangings, waves, skies, flames and plants, or even animal and human shapes.” Those external elements, however, indeed only become images through their psychic counterparts—a “beholder [ready] for their realization.”[11]

Gamboni suggests that, in its cultural dimension, the use of chance patterns could have in fact been been regarded as somewhat miraculous, maybe situated on a scale from what he calls ”generic intentionality” that triggers the imagination versus the “specific intentionality” associated with an identifiable author. Late Antique texts such as Alberti’s ‘De Pictura’ suspected that “nature itself takes pleasure in painting,” which, bearing in mind the role of the *marmorarios*—the skilled and highly sought specialist workers able to select and match the pieces into images—creates a double simulacrum of sorts. Daniel Arasse describes this paradox as “the painter who imitates nature as it imitates painting,” thus entering, in a sense, into an ambiguous assembly of co-authorship—not only with the natural material as such but with a geological process. “Effects that time are producing,”[12] operating on a scale that is almost totally incommensurable with the perspective of a single human or even that of humanity as a whole.

Together, they produce “an unreal ensemble of new things, of objects I have never seen and will never see, but which are nonetheless unreal objects, objects that have no existence in the painting, nor anywhere in the world.”[13] Interestingly, this would seem to be a notion of

authorship which a Late Antique audience might have been prepared to embrace, perhaps much more readily so than we are today.

## PROCESS OR CATASTROPHE

Within the notion of the miraculous, another cognitive effect is nested. As much as we tend towards apophenia in our perception and seem to yearn for causalities and signs of the supernatural in our environment, we find it hard to comprehend slower or less linear processes. Much of reality happens in plain sight, yet remains outside of our experiential register as it may be too slow, too multitudinous, too distributed, and so on. The Japanese language refers to this as 'kuuki yomenai' (literally: 'air read-not'), to not see the ambient process that gives shape to the world. In English, the clinical term for the inability to process information is 'agnosia,' an antonym to the Greek 'gnosis' (knowledge, in the sense of personal knowledge as opposed to intellectual knowledge, 'eídein') and signifies an absence of subjective comprehension of the world,  to which the particular aspect that can not be grasped is typically prepended. We shall thus propose '*pattern agnosia*' for our inability to see emergent phenomena, and assume that this condition may be congenital in our species rather than acquired.

A poignant example of pattern agnosia which relates to the miraculous, is the notion of 'catastrophism' that appeared around the early nineteenth century. After being popularised by French anatomist and paleontologist Georges Cuvier, a controversy between catastrophists and uniformitarians unfolded within the field of geology in regard to the often pronounced changes between different strata in the geological record. While Cuvier was careful to avoid religious speculation, British catastrophists such as William Buckland and

Robert Jameson attempted to explicitly unite the biblical account of a universal flood with available geological evidence and “argued for an interventionist interpretation of [the geological record], taking discontinuities [...] to be indicators of the occurrence of miracles—violations of laws of nature.”[14]

Another British researcher who at the time took particular interest in the matter was the mathematician, philosopher, inventor and mechanical engineer Charles Babbage. In his account of Babbage’s contribution to the “emergence of automated reason,” complexity researcher Seth Bullock describes his intent to demonstrate to an audience at this private residence in London’s Marylebone that such discontinuities can indeed emerge from an undisturbed, uniform system. In this case, the system was an anthropogenic one: Babbage’s so-called ‘difference engine’—an automatic mechanical calculator widely regarded to be one of the first modern computers. Babbage would program the mechanism to perform operations according to one mathematical function up to a certain point where it would switch to another one, producing radically different results. Apart from turning the hand-crank (the origin of the notion of ‘cycles’ in computing,) “the general law, or program, that the machine was obeying would not have changed. The discontinuity would have been the result of the naturally unfolding mechanical and computational process. No external tinkering analogous to the intervention of a providential deity would have taken place”[15]

This demonstrated to those present that “nonlinearities in the interactions between a system’s components give rise to unexpected (and possibly irreducible, that is, quasi-miraculous) global phenomena,”[16] such as those evident in the geological record. Crucially, it did so “not [by shedding] light directly on geological discontinuity per se,” but

rather by numerically creating a pattern that is analogous, which makes it the first published example of a simulation model in the contemporary sense. It "[forces] an audience to reflect on their own reasoning processes [and] seeks to re-arrange their theoretical commitments"[17]

## ANY TIGER IS A TIGER

From this historical account, a question emerges: If numerical modelling such as Babbage's demonstration is able to produce patterns that through simulation enter into a relationship of similitude with a 'natural' object or phenomenon, then what *are* such patterns in terms of ontology?

A fairly strange yet pertinent exploration is offered by philosopher David Wallace as he considers the implications the so-called 'many-worlds interpretation' of quantum physics, that was formulated by physicist Hugh Everett in 1957. Wallace points out that, while '"tigers are unquestionably real in any reasonable sense of the word [...] they are certainly not part of the basic ontology of any physical theory,"[18] that is that there is no such (irreducible) thing as a 'tiger' that by itself emerges from the axioms of quantum physics. He instead proposes that a tiger constitutes something akin to an ontology of a higher order, suggesting that "a tiger is any pattern which behaves as a tiger" and that all such patterns "are to be regarded as real."[19]

The consequences of this claim are far-reaching, as Wallace himself does not fail to realize. It suggests that things, especially those we consider to be 'natural,' may emerge from patterns which "can be imprecise [...] may involve dynamics or be temporally extended [depending] on

the behaviour over some timescale of the constituents of a pattern."[20] Ultimately, this view places "behavioural patterns"[21] of a system, such as an organism (i.e. the *tigerness* of the tiger) above its basic materiality, with a process now occupying the heart of its being.

Another circumstance that follows is that if a pattern of a higher order is the determining factor of an object's "transtemporal identity," then the specific process which gives rise to it may be interchangeable. Other configurations of matter could theoretically produce macroscopic patterns that would *usefully*, that is in terms of its predictability, satisfy the original postulate that "a tiger is any pattern which behaves as a tiger."[22] A world in which a simulacrum can achieve similitude in the dimension of its behavioral pattern, rendering it the same *thing* and where similitudinous patterns may be achieved through different routes, or many times over.

## NATURAL PATTERNS AND MACHINIC APOPHENIA

Darwinian evolution of the natural world is one of the prime examples we have for the similitude of patterns which have given rise to emergent effects in organisms such as visual camouflage or perhaps even cognition. British mathematician Alan Turing, for instance, in his 1952 article on "The Chemical Basis of Morphogenesis" pointed out that certain patterns the coats of animals (now often referred to as 'Turing patterns') such as the stripes of a zebra, in fact emerge from "reaction–diffusion" phenomena. Processes which essentially are computational in nature and as such can be usefully simulated by a machine. It was also Turing who, in a more famous essay called "Computing Machinery and Intelligence" from 1950, pondered the question "can machines think?" Instead of an answer, he suggests a different question: "Are there imaginable digital computers which would do well in the

imitation game?"[23] Asserting that the "special property of digital computers [is] that they are universal machines," he dismisses the question, lengthily hinting at the fact that maybe thinking, itself at its most fundamental level, may be a computational process. In this case, one such (still hypothetical) universal machine could very well produce a pattern that would stand in similitude to what we call 'intelligence,' perhaps arriving at it by taking a radically different route which still leads to higher-order commensurability with our own pattern of intelligence—systems that communicate.

A contemporary weak signal of this future can perhaps be found in so called 'convolutional neural networks,' one of the technologies that are typically grouped under the term 'artificial intelligence' that historically emerged from computational neuroscientists Warren McCulloch's and Walter Pitt's theoretical considerations of an 'artificial neuron' in the late 1940s. Neural networks are typically 'trained' on existing datasets, for instance in order to be able to recognize faces among images. In the process of capturing information as probabilistic weights between a series of layers, in a sense they come to embody the visual pattern that *is* a face. A trained system can then be asked to determine the probability of a new image to be a face. It can also be asked to iteratively generate the likeness of what it considers a face from virtually any other image, or even from random noise. As the process progresses, faces emerge and over time increasingly gain shape, often producing a surreal visual result.[24] The explanation for this effect given is that, although a neural network must be very different from our brain, it exhibits—apophenia.

This is where we return to the acheiropoetic image found in marble. It seems as if in a discursive history around what we see and that what we fail to see, we have, perhaps

somewhat accidentally and in an act of self-simulation, not only begun to produce entities that exhibit the same fallacies as ourselves; we have also operationalized an ontology that originates from a processes that are congenitally alien to us—those that are too vast, too distributed or too transtemporal now stand in front of us. Anthropogenic in nature, yet suggesting a truly post-anthropocentric reality, where sentience in the classical sense may exist beyond our species.

The impacts on our view on creativity are likely to be vast and it will certainly be fascinating for future art-historians to analyze how this dissolution of agency subjectivity eventually unfolded. In a first step, perhaps, our notion of authorship will depart from a singular notion of artistic agency and re-approach the ambiguous assembly of co-authorship that a Late Antique audience might have assumed as a given.

Or in Alan Turing's words, when having an inner dialogue on with Babbage's colleague Ada Lovelace concerning extra-human creativity: "Machines take me by surprise with great frequency."[25]

# Notes

1. Onians, J. The Origins of Image Making, Current Anthropology, Vol. 27, No. 3, P. 7
2. https://en.wikipedia.org/wiki/Marble (Accessed Dec 2017)
3. Barry, F., Walking on Water: Cosmic Floors in Antiquity and the Middle Ages, The Art Bulletin, Vol. 89, No. 4, P. 627
4. Ibid, Walking on Water, p.637
5. Onians, P. 9
6. Narratio de S. Sophia, P. 26
7. Procopius, Buildings of Justinian, I. 59-61, in Onians
8. Onians, P. 12
9. Gamboni, D., Potential Images: Ambiguity and Indeterminacy in Modern Art, Reaktion Books, P. 15
10. Jean-Paul Sartre in Gamboni, P. 15
11. Gamboni, P. 18
12. Javier Fresneda in conversation at UC San Diego, October 2016
13. Gamboni, P. 15
14. Bullock, S., in The Mechanical Mind in History, The MIT Press, 2008, P. 22
15. Ibid., P. 23
16. Ibid., P. 26
17. Ibid., P. 25
18. Wallace, D., Everett and Structure, Studies in the Hist. and Philosophy of Modern Physics 34, 2003, P. 6
19. Ibid., P. 7
20. Ibid., P. 9
21. Ibid., P. 15
22. Wallace refers to this as Dennet's Criterion: "A macro-object is a pattern, and the ex- istence of a pattern as a real thing depends on the usefulness — in particular, the explanatory power and predictive reliability — of theories which admit that pattern in their ontology."
23. An experimental setup, now often referred to as the 'Turing Test' which aims to determine whether a machine that can successfully deceive a human into believing that it too is human, thus passing as usefully (in the sense used previously) intelligent.
24. For examples see: Mordvintsev, A.; Olah, C.; Tyka, M, Inceptionism: Going Deeper into Neural Networks, Google Research, 2015, https://research.googleblog.com/2015/06/inceptionism-going-deeper-into-neural.html (accessed Dec 2016)
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