**MAPPING INDIGENOUS THOUGHT in
the TIME BEFORE EUROPEAN HISTORY**
by John Barclay-Morton

Mapping Visual & Textural Structures

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PreAmble:

Counter Mapping

by Adam Loften &
Emmanuel Vaughan-Lee
in *Emergence Magazine*

"Jim Enote, a traditional Zuni farmer and director of the A:shiwi A:wan Museum and Heritage Center, is working with Zuni artists to create maps that bring an indigenous voice and perspective back to the land, countering Western notions of place and geography and challenging the arbitrary borders imposed on the Zuni world."
"Listening to the land is part of Jim's vision in collaborating with Zuni artists to create maps that challenge conventional ideas of mapping. In 2006, Jim brought together a group of Zuni elders, council members, and religious leaders to serve on a cultural advisory committee. Together, they began to imagine what it would mean to create "counter maps"—maps that reclaim the names of Zuni places and depict the land of the A:shiwi as they know and see it, immersing the viewer in a landscape interwoven with culture, story, and prayer."
"The Zuni maps, says Jim, contain something very important: a different way of looking and knowing. "To assume that people would look at the earth only from a vantage point that is above and looking straight down doesn't consider the humanity of living on the landscape. Saying that there's a pond, there are cattails, there are turtles in that water—that is a different view that expands the human experience of a place."
"THE ZUNI MAPS remind us that modern, conventional maps convey only one very particular way of being in place, one which often, counterintuitively, leaves us disoriented and disconnected. Conventional maps do not tell us what it means to be somewhere—the details of the landscapes we live in, the sounds of the trees and the birds, the long histories of the arroyos and the mountains, the names of the people who built our homes.
"Modern maps don't have a memory," says Jim. "For me, the whole landscape around here is home. I have patterned languages that help me to remember how I get from one place to another. I go to my field in the summer. I collect wood in the fall and winter. I may be pinion picking or going to collect tea. . . . This whole constellation of what makes up a map to me has always been far beyond a piece of paper."

A Walk-Through

In 1991, I came upon a small artifact that I quickly established (to my own philosophic satisfaction) was an example of a previously undocumented form of image writing — one originally created and used by the First Nations of North America prior to European contact.

Since that moment, I have been working to document this form of non-phonetic writing, which I have taken to calling *anametric image writing*. I am using the term anametric here to emphasize the temporal nature of the image composites found within this form of image writing. It is in the way that *different kinds* of things are shown here, through the compositional nature of the grouping patterns that bind together image elements, that this form of writing can be clearly distinguished from a system of phonetic signification: there, each singular sound of speech would be represented by a distinct sign or specific image (a correspondence akin to numerical ascription):

"The important thing here is that the decomposition of the composite reveals to us two types of multiplicity. One is represented by space . . . It is a multiplicity of exteriority, of simultaneity, of juxtaposition, of order, of quantitative differentiation, of *difference in degree*; it is a numerical multiplicity, *discontinuous and actual*. The other type of multiplicity appears in pure duration: It is an internal multiplicity of succession, of fusion, of

organization, of heterogeneity, of qualitative discrimination, or of *difference in kind*; it is a *virtual and continuous* multiplicity that cannot be reduced to numbers [Gilles Deleuze, *Bergsonism*, pg. 38]."

While the importance of the definitional role played by temporal duration in the functional nature displayed by this form of image writing is immediately apparent, the singular question that has guided my research has been a simple one: How is it that I can understand a form of writing created long before my time, by a culture I did not share?

Since I am not party to the significations of meaning held in languages spoken by those who produced this writing, the only possible answer would be: The grammatological principles which inform this writing are derived from basic patterns of neural function shared across all human populations. An important corollary of this proposition would be: To the extent that our knowledge of neural functions can inform our understanding of this written form, so too might our knowledge of this form of writing enhance our understanding of neural functions; and this, specifically with regard to ways in which neural processes relate to our experience of consciousness.

Once again, temporal duration proves to play a keynote role here, and one that is easily discernible in the stabilization of grouping patterns seen resolving from differential image elements — a processes which can be identified as grammatological in nature:

> "In reality, duration divides up and does so constantly: That is why it is a *multiplicity*. But it does not divide up without changing in kind, it changes in kind in the process of dividing up: This is why it is a nonnumerical multiplicity, where we can speak of "indivisibles" at each stage of the division. There is *other* without there being *several*; number exists only potentially. In other words, the subjective, or duration, is the *virtual*. To be more precise, it is the virtual insofar as it is actualized, in the course being actualized, it is inseparable from the movement of its actualization [Deleuze, *Bergsonism*, pg. 42]."

This stabilization of grouping patterns, as resolved from differential image elements, is in each case "the movement of it[s] actualization." Such stable states can be equated with conscious awareness,

which in turn offers the possibility of exploring the neural processes through which visual cognition functions. In short: it may be possible to discern traces of the neural functions that inform visual awareness by examining how grouping patterns of image elements are actualized as stable composites conveying differences in kind.

Over the decades my research efforts have spanned, many advances have been made in the clinical imaging techniques utilized for discerning neural functions within the brain. Because the form of writing I have been documenting is image-based rather than phonetic in nature, important initial insights into its grammatological structure can be made by studying the neurology of vision. Beyond this, the possibility of exploring neural functions as they relate to more developed aspects of consciousness also exists in relation to this research.

Seeing Different Faces

Recent discoveries by Doris Tsao are particularly illuminating with respect to the way in which we visually process human faces. This is of immediate interest here, given that facial composites form prominent aspects of the first example of anametric image writing I happened upon — as well as all subsequent examples I have found. Through research that has reshaped our understanding of the neural processes which inform conscious awareness, Tsao demonstrated that (rather than having specific neurons attuned to particular faces, as had long been suspected), facial recognition proceeds through a complex range of 50+ differential contrasts:

> "The finding proved that face cells are not coding the identities of specific individuals in the IT cortex. Instead they are performing an axis projection, a much more abstract computation.
> "An analogy can be made to color. Colors can be coded by specific names, such as periwinkle, celandine and azure. Alternatively, one can code colors by particular combinations of three simple numbers that represent the amount of red, green and blue that make up that color. In the latter scheme, a color cell performing a projection onto the red axes would fire electrical impulses, or spikes, proportional to the amount of red in any color. Such a cell would fire at the same intensity for a brown or yellow color containing the same amount of red mixed in with other colors. Face cells use the same scheme, but instead of just three axes, there are 50. And

instead of each axis coding the amount of red, green or blue, each axes codes the amount of deviation of the shade or appearance of any given face from an average face.

"It would seem then that the Jennifer Aniston cells do not exist, at least not in the IT cortex. But single neurons responding selectively to specific familiar individuals may still be at work in a part of the brain that processes the output of face cells. Memory storage regions—the hippocampus and surrounding areas—may contain cells that help a person recognize someone from past experience, akin to the famed grandmother cells.

"Facial recognition in the IT cortex thus rests on a set of about 50 numbers in total that represents the measurement of a face along a set of axes. And the discovery of this extremely simple code for face identity has major implications for our understanding of visual object representation. It is possible that all of the IT cortex might be organized along the same principles governing the face-patch system, with clusters of neurons encoding different sets of axes to represent an object. We are now conducting experiments to test this idea [Tsao, *Scientific American*, Feb. 2019, pg. 29]."

Working from within the academic heritage of European linguistic traditions, when we are dealing with phonetically-based forms of writing, we invariably use spoken languages as the model upon which we base our understanding of how writing functions communicatively. With spoken languages, we are used to working with sound sequences which indicate specific words that designate particular things and concepts. In a word, we are working with processes of signification, whereby signifiers are paired with their signifieds. And although, based upon this model of meaning, we might imagine that our recognition of specific faces could be paired with singularly specific neurons that are triggered to produce a state of conscious recognition, we now know that this is not the case. Instead, facial recognition proceeds through a complex process involving multiple differentials of perceived contrast.

That the neural processes which inform facial recognition function in a manner quite distinct from processes of signification suggests that an alternative approach for defining how image writing functions might be viable — a possibility

supported by the preponderance of facial composites evident within this form of writing. A tentative first step can be taken toward moving beyond the constraints of designated meaning imposed by a model of signification drawn from phonetic speech patterns, through instead considering the nature of grammatological functions. In a grammatological context, having the functionality of differential contrasts (such as those which inform facial recognition) displace the semiological relationship of signification (signifier/signified designations of word/object) opens the way for understanding how an image-based form of writing can function without needing recourse to the representational structures and meanings which characterize phonetic formulations for speech-based writing systems. As Jacques Derrida notes:

"It is a question… of producing a new concept of writing. This concept can be called *gram* or *différance*. The play of differences supposes, in effect, syntheses and referrals which forbid at any moment, or in any sense, that a simple element be *present* in and of itself, referring only to itself. Whether in the order of the spoken or written discourse, no element can function as a sign without referring to another element which itself is not simply present. This interweaving results in each "element" – phoneme or grapheme – being constituted on the basis of the trace within it of the other elements of the chain or system. This interweaving, this textile, is the *text* produced only in the transformation of another text. Nothing, neither among the elements nor within the system, is anywhere ever simply present or absent. There are only, everywhere, differences and traces of traces. The gram, then, is the most general concept of semiology – which thus becomes grammatology – and it covers not only the field of writing in the restricted sense, but also the field of linguistics. The advantage of this concept – provided that it be surrounded by a certain interpretive context, for no more than any other conceptual element it does not signify, or suffice, by itself – is that in principle it neutralizes the phonologistic propensity of the "sign," and *in fact counterbalances* it by liberating the entire scientific field of the "graphic substance" (history and systems of writing beyond the bounds of the West) whose interest is not minimal, but which so far has been left in the shadows of neglect."

"The gram as *différance*, then is a structure and a movement no longer conceivable on the basis of the opposition presence/absence. *Différance* is the systematic play of differences, of the traces of differences of the *spacing* by means of which elements are related to each other [Derrida, *Positions*, pgs 23-24]."

When we apply Derrida's concept of *différance* to anametric image writing, within the specific context of facial composites where Tsao's research would indicate its immediately appropriate integration, we find that the functional nature of the *gram* can be isolated and defined in terms of spacing — that is, of positional localization. Having variable image elements positionally localized as components of facial composites directly constitutes a grammatological function, in producing of faciality a composition "on the basis of the trace within it of the other elements".

A simple hypothetical example serves to illustrate this point: If a facial composite is presented where the mouth is formed by the image of a canoe, one eye is formed by the image of a deer, and, the other eye is formed by the image of an arrowhead pointed toward the deer; then, by itself this composite of a happy face conveys the idea of someone traveling by canoe to an area where they can successfully hunt deer.

Note the efficiency of this writing form: three differential elements, which are positionally localized through the array of differential contrasts that determine facial composition, communicate an idea which would require significantly more space to convey when using phonetic forms of inscription.

Note that, in the context of faciality, the process of positional localization — in a form of "mapping" that proceeds through "survey" — functions to impart a differential nature to the image elements which compositionally form any face that is recognized as such. In this, note also that the kinds of differential contrasts found by Tsao to form the functional basis for facial recognition themselves tend toward positional localization: for instance, that noses strongly tend to be brighter in their relative luminosity when contrasted with eyes, which strongly tend to be darker.

The Language of Thought

Derrida's critique of phonetic writing emerged as one aspect of post-structural philosophy's relentless drive toward a thorough and unwavering confrontation of ideological thought in all of its manifestations. Emerging from the ashes of Continental Europe following the disaster that was World War II, post-structuralism demanded answers as to why some prominent philosophers (such as Martin Heidegger) could have chosen to support the inhumanity of fascism. In doing so, Continental Schools of philosophy set in motion new approaches toward thought that sought the removal of any ideological determinations which structurally preordained the imposition of artificial constraints upon a manifest freedom to think the world as it is directly experienced.

This new approach to thought ultimately encompassed a thorough critique of "The Linguistic Paradigm", which had eventually come to dominate modern philosophy by asserting the surest way to understand the nature of thought was through a meticulous study of language. This approach unfortunately incorporated a preferential study of European languages, as typifying thoughtfulness.

The direct outcome that proceeded from appointing one linguistic family as paradigmatic for all thought, was to unreflectively grant values inherent in those collective languages an implicit judicial status for arbitrating what constitutes truth and the grounds upon which veracity is granted. This conceptual position is particularly evident throughout the history of Western metaphysics, where physical presence equates to a temporal sense of the present in establishing an ontology of physical manifestation. This is in contrast (for example) to the temporal structures found across the languages used by the First Nations of North America, which tend toward forming referential structures that instead implicate a multiplicity of energy patterns, as waveforms of a varying periodic and aperiodic nature (as opposed to a tripartite differentiation between past, present, and future).

Derrida, through an early work which analyzed Edmund Husserl's "Origin of Geometry", succinctly assessed such phonocentric and ideocentric approaches:

"Their "stagnation" would not be the mere absence of historicity but a kind of finitude in the project and recollection of sense. Therefore, and only in comparison with the infinite and pure historicity of the European *eidos*, do archaic societies seem "without history." In the *Crisis*, moreover, Husserl only recognizes an *empirical* type in those societies which do not participate in the European Idea. Nonhistoricity, then, would

only be the lower limit-mode of empirical historicity. The ambiguity of an *example* which is at once an undistinguished *sample* and a teleological *model* is still found here. In the first sense, in fact, we could say with Husserl that every community is in history, that historicity is the essential horizon of humanity, insofar as there is no humanity without sociality and culture. From this perspective, any society at all, European, archaic, or some other, can serve as an example in an eidetic recognition. But on the other hand, Europe has the privilege of being the *good example*, for it incarnates in its purity the Telos of all historicity: universality, omnitemporality, infinite traditionality, and so forth; by investigating the sense of the pure and infinite possibility of historicity, Europe has awakened history to its own proper end [Jacques Derrida, *Edmund Husserl's 'Origin of Geometry': An Introduction*; page 115]."

The post-structural critique of The Linguistic Paradigm stressed that any preferential study of a specific language as "a good example" would inevitably favor particular ways of thinking, to the exclusion of other possibilities; and that assigning a preferential status to the spoken words of a specific linguistic group (i.e. the Western European languages that dominate academia) would invariably introduced a particularly egregious form of ideological discrimination.

It is important to closely assess how such prejudicial determinations proceed, and to pull apart the nexus of affiliated thoughts that form from such a constellation of preconceptions. Primary among these determinations are those attributable to what Husserl termed the "European *eidos*", which is something that is simply assumed to be superior to any other forms thought might take. Husserl's vision for his own culture's thought forms revolved around a Neo-Platonic approach to discerning the essential structure of anything encountered within conscious awareness: "imaginary variation". Taking any example of what might be encountered within thought, Husserl proposed that multiplying this through every possible variation imaginable and then reducing these to whatever aspects remained common to all would reveal the "essential nature" of that which was under consideration.

The primary and terminal flaw in this approach was revealed by Jean-Paul Sartre in 1940 through his seminal text, *The Imaginary: A phenomenological psychology of the imagination*: that Husserl had

assumed the veracity of direct sensory perception carried over into mental imagery, which was simply another manifestation of perception. Not so, demonstrated Sartre, by meticulously documenting how "imaging consciousness" — the imagination — is an entirely different form of conscious awareness than direct visual perception.

In Husserl's approach, we can immediately see how the ascription of truth figures prominently in the conceptual maneuver which grants European thought precedence over any other forms; and, in turn, how this grounds ascriptions of validity and value in accordance with European norms. This can be directly seen in Husserl's presentation of European society and culture as being "privileged" as a "good example", on the grounds of its "purity".

The point where Sartre's critique of Husserl's phenomenology cleaves the core of that practice open is one of particular interest here: as the distinction between direct sensory perception and thought, it is also the distinction between empirical experience and transcendental knowledge. Such distinctions remain of great consequence, for they directly parallel the question of how sensory perception gives rise to conscious awareness. For Sartre, following from his critique of Husserl's phenomenology, this primary concern became what would come to be known as Existentialism. Following from Sartre, it would be direct empirical encounters within existential reality that ground validity for conscious awareness — not the cultural norms instituted by linguistic paradigms.

Husserl was ultimately concerned with making a case for viewing geometry as what Sartre would call a "non-subjective transcendental field" — that is, an interconnected collection of objective rules that exists independently from any particular person. The axioms of geometry provide Husserl with an ideal model for this view; and such fields also correspond to how language is generally understood and described, because non-subjective transcendental fields are tasked with lifting the immediacy of direct perception (as empirical engagement with the real) out of the individual's immediate experience, and making these experiences capable of being communicated intersubjectively. In this, the transcendental encompasses ways in which experience can be shared beyond any direct engagement with the real, to be communicated to others who were not directly party to the experiences being conveyed.

Following from Derrida, through Tsao, we discover the possibility that employing the neurological

processes which inform visual perception as conscious awareness, can provide what becomes the grammatological principles defining anametric image writing as a non-subjective transcendental field. Keynote in this are differential contrasts, and positional localization.

Picture Placing Writing

In forcing apart an assumed correlation between specific spoken languages and a sense of validity for the ways in which thought takes form, the deconstructive insights of post-structural philosophy opened new approaches to thought, which allow for an accurate assessment of the image-based form of writing I have been documenting. At the same time within philosophy, another approach toward conceptualizing thought was gaining acceptance: The Biological Model. First taking hold within Anglo-American Schools of philosophic thought, this approach held that the manifestation of consciousness as thought was predicated upon neural processes that could be described and explained in biological terms. This approach would prove to be a very powerful tool for understanding how conscious awareness is informed by distinct and identifiable neural processes, and it has been greatly aided by advances in clinical imaging that have allowed for the real-time assessment of those processes.

However, it is only over the past few decades that the neurological underpinnings which ground the functional nature of anametric image writing have started to emerge. Taken together, the shift in linguistic analysis toward grammatological functionality afforded by post-structural philosophy, and the access provided to the functional aspects of neurological processes referenced through The Biological Model, provide an effective alternative to The Linguistic Paradigm. It is only through such a hybrid approach that an accurate assessment of this form of image writing, which arose independently from the phonetic forms of writing attending European languages, can proceed in a fashion that does justice to anametric image writing in its own right.

In anametric image writing, facial composites play an integral part of the grammatology processes that inform the conceptual constructs being produced. We now know that facial constructs are processed by neurological processes which function by assessing a wide range of differential contrasts; and in anametric image writing, we find that the image elements which are utilized in the creation of facial composites can be very different from what we might expect to see. Drawing upon a prior example, we might find what is clearly a face

being portrayed, but with a canoe for a smiling mouth, a deer for one eye, and an arrowhead for the other eye. Obviously, this would convey that someone was happy in the context of hunting; but, why can we say this with any degree of assurance that it is so?

Consider how Charles Sanders Pierce, widely viewed as the father of American linguistics, defined semiological constructs:

> "*Of logic as a study of signs*."
> "A sign is something which stands for another thing to a mind. To it existence as such three things are requisite. On the first place, it must have characters which shall enable us to distinguish it from other objects. In the second place, it must be affected in some way by the object which it signified or at least something about it must vary as a consequence of a real causation with some variation of its object [Marty, 4 - 1873 - MS 380]."

With phonetic forms of writing, we encounter specific visual characters that represent the sounds of spoken languages. There is no necessary connection between the shape of any such character and the sound it represents: this is an entirely arbitrary matter of convention, as is the process of signification in general. To be legible, the characters that signify specific sounds in phonetic forms of writing need only be distinguishable from the background upon which they appear — as well as from each other.

The differentially variant image elements found throughout anametric image writing function in a way that is quite distinct from this; although, what can be said of these is also necessarily true of the characters that form phonetic forms of writing:

> "The majority of schematic drawings are read in a definite sense. Eye movements organize the perception, carve out the spatial environment, determine the fields of force, transform the lines into vectors [Sartre, *The Imaginary*, pg. 30]."

Taken as by nature comparable to schematic drawings, the differential image elements of anametric image writing are distinguishable through the simple process of eye movement tracing. This very basic aspect of visual neurology proceeds in a distinctly spatial manner that in effect positionally localizes the characteristics through which visual aspects are grouped together, and grasped in conscious awareness as immanent

in compositionally constituting anything distinctly identifiable as different in its own right.

At the same time, something else is happening; and, it is something that is very different than what proceeds from recognition in phonetic writing. In anametric image writing, visual schema are directly and immediately composed as conceptual formulations:

> "But it is very evident that the comprehension is realized in and by the construction. The structure of the concept to be comprehended serves as a rule for the elaboration of the schema and one becomes conscious of this rule by the very fact of applying it. So that, once the schema is constructed, there remains nothing more to comprehend [Sartre, *The Imaginary*, pg. 103]."

When working with differential image elements as visual schema, we are already working directly with conceptual structures — and we are doing so without needing any recourse to phonetic significations of meaning:

> "Comprehension is not pure reproduction of the signification. It is an act. This act aims at making present a certain object and this object is, in general, a truth of judgment or a conceptual structure [Sartre, *The Imaginary*, pg. 104]."

In the hypothetical example presented earlier, we clearly have, in agreement with Peirce, "one thing occurring in the place of another" — a canoe for a mouth, a deer or an arrowhead for an eye — but, this isn't happening as a process of signification; instead, it is occurring in the composition of what Derrida would refer to as a differential texture — something we now know that facial recognition is neurologically predisposed toward. Although we are clearly dealing with a semiological process here, it isn't one which we would be able to describe as signification: the image elements we recognize are simply assuming the positional localizations of facial components, rather than specifying those facial aspects. In short, the compositional aspect of a face's differential contrasts is being used as a grammatological principle for associating together within a single composite structure what would otherwise be seen as wildly disparate image elements.

Differential image elements being positionally localized (as something occurring in the place of something else) provide a grammatological context for what is definitionally a semiological function. Something else is also happening in this, however; because, the grammatological nature of composites rendered in this manner places the semiological functions that form here beyond a simple, representational form of signification that would link isolated signs with referentially singular identities. A compositional texture is also emerging, and it is doing so simultaneous to the establishment of those semiological aspects which are being rendered as inherent within differential image elements. In this, we must note that the most basic difference, between what we see in systems of phonetic signification and what is occurring with anametric image writing, parallels the distinction made by Henri Bergson in distinguishing the numerical multiplicities characteristic of measure from the nonnumerical multiplicities that characterize duration. Signification assigns determinate representations for things, as is found with numbers representing values for measurement; but with anametric image writing, we are seeing shifting grouping patterns forming from differential textures. These are, as Derrida describes, "never simply present or absent" but are instead grouped together, through temporal immanence, as patterns of duration:

> "Everything is actual in the numerical multiplicity; everything is not "realized," but everything there is actual. There are no relationships other than those between actuals, and no differences other than those in degree. On the other hand, a nonnumerical multiplicity by which duration or subjectivity is defined, plunges into another dimension, which is no longer spatial and is purely temporal: It moves from the virtual to its actualization, it actualizes itself by creating lines of differentiation that correspond to its differences in time. A multiplicity of this kind has, essentially, the three properties of continuity, heterogeneity, and simplicity [Deleuze, *Bergsonism*, pg. 43]."

What is really interesting here is that the process of eye movement tracing outlined by Sartre of schema leads directly to the formation of conceptual structures — and, through the differences-in-kind described by Bergson, to composite grouping patterns that are characteristic of durations. In this, we find that the positional localization afforded by faciality naturally folds from simple spatial arrangements into complex conceptual assemblages of durational grouping patterns. The nature of these grammatological processes provide relational contexts which

function every bit as effectively as the associational rules of performative competency that govern spoken languages and provide communicative cohesion for phonetic forms of writing. The schematic nature of anametric image writing places it immediately within the realm of conceptual constructs, bypassing the intermediary forms of spoken, referential languages by engaging directly the compositional nature of concept formation:

"First, every concept relates back to other concepts, not only in its history but in its becoming or its present connections. Every concept has components that may, in turn, be grasped as concepts (so that the Other Person has the face among its components, but the Face will be considered as a concept with its own components). Concepts, therefore, extend to infinity and, being created, are never created from nothing. Second, what is distinctive about the concept is that it renders components inseparable *within itself*. Components, or what defines the *consistency* of the concept, its endoconsistency, are distinct, heterogeneous, and yet not separable. The point is that each partially overlaps, has a neighborhood, or threshold of indiscernability, with one another . . . Components remain distinct, but something passes from one to the other, something that is undecidable between them. There is an area *ab* that belongs to both *a* and *b*, where *a* and *b* "become" indiscernable. These zones, thresholds, or becomings, this inseparability define the internal consistency of the concept. But the concept also has exoconsistency with other concepts, when their respective creation implies the construction of a bridge on the same plane. Zones and bridges are the joints of the concept.
"Third, each concept will therefore be considered as the point of coincidence, condensation, or accumulation of its own components, rising and falling within them. In this sense, each component is an *intensive feature*, an intensive ordinate, which must be understood not as a general or particular but as a pure and simple singularity — "a" possible world, "a" face, "some" words — that is particularized or generalized depending upon whether it is given variable values or a constant function. But, unlike the position in science, there is neither constant nor variable in the

concept, and we no more pick out a variable species for a constant genus than we do a constant species for variable individuals . . . The concept of a bird is found not in its genus or species but in the composition of its postures, colors, and songs . . . The concept is in a state of *survey* in relation to its components, endlessly traversing them according to an order without distance. It is immediately co-present to all its components or variations, at no distance from them, passing back and forth through them . . . [Deleuze and Guattari, *What Is Philosophy*, pgs. 19-20-21]".

In other words, in that the schematic nature of differential image elements directly produce conceptual structures; and, given that both the endoconsistency and the exoconsistency of conceptual structures are entirely in accordance with the kinds of grouping patterns found to form of differential textures, as defined in grammatological terms: It is a matter of the grammatological nature which defines anametric image writing that it supports narrative structures (which are, in fact, meta-narrative composites), by virtue of supporting concept formation through the durational grouping patterns of differential image elements.

Such linguistic functionality is entirely separate from the nature of phonetic signification which spoken languages employ, and which is transposed into phonetic writing to impart its intersubjectively communicative structure.

Returning briefly to Peirce, consider his engagement with the processes that Sartre defined in terms of eye movement tracing; that is, the very basic visual functions which for Sartre directly yielded conceptual determinations — the "material qualities" of visual inscription:

"*On the nature of Signs*."
"A sign is an object which stands for another to some mind. I propose to describe the characters of a sign. In the first place like any other thing it must have qualities which belong to it whether it be regarded as a sign or not thus a printed word is black, has a certain number of letters and those letters have certain shapes. Such characters of a sign I call its material quality. In the next place a sign must have some real connection with the thing it signifies so that when the object is present or is so as the sign signifies it to be the sign shall so signify it and otherwise not. [...] In the first place it is

necessary for a sign to be a sign that it should be regarded as a sign for it is only a sign to that mind which so considers and if it is not a sign to any mind it is not a sign at all. It must be known to the mind first in its material qualities but also in its pure demonstrative application. That mind must conceive it to be connected with its object so that it is possible to reason from the sign to the thing [Marty, 64 - MS 381]."

Having seen that the visual schema of anametric image writing directly produce conceptual structures without any necessary recourse to the referential significations that characterize phonetic forms of speech and writing, it is interesting to see precisely how this proceeds. Félix Guattari provides a particularly insightful analysis of the relationships that hold between such a precursive form of conceptual creation, and the representational forms that phonetic signification take:

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matter, any direct sensory engagement with existential reality begins by resolving characteristic traits (through a process of *survey*) that can be grouped together (through positional localization) as immanent to each other. This is the process of concept production that distinguished specific substances from an undifferentiated background of matter: this is the process of determining material qualities, and it can be described as the process of *substantiation*.

I note in passing that a grammatological context for the process of substantiation will yield much more than simply conceptual structures: indeed,

what would be created here is a complex texture of interrelated grouping patterns that, definitionally determined as substantiation, in effect institutes the conditions through which truth and veracity are communicatively conveyed with respect to real world, existential occurrences. Considering again the Eurocentric position held by Husserl, the counter-positional insights offered here by Guattari clearly indicate how anametric image writing can function communicatively, in establishing a horizon of historicity, without any direct or indeed necessary recourse to phonetic forms of signification.

Transforming Positional Locations

The process of substantiation, which proceeds through grouping together in immanence characteristic material qualities that distinguish distinctly substantive differences, incorporates a process encountered earlier as characteristic for grammatological functions identified in the context of facial recognition: that of positional localization. In seeking to identify neural processes that might provide a basis for the grammatological functions that inform anametric image writing, it has become evident that very basic aspects of visual awareness (such as facial recognition, as well as eye movement tracing and the directly affiliated process of *survey* that accompanies the realization of concepts) can and do provide the communicative coherence necessary for forming a non-subjective transcendental field capable of conveying information exclusively through the grouping patterns that attend differential image elements.

Considering this in greater depth, positional localization turns out to be keynote for further analysis; for we now also know something of the neurological processes through which a sense of position is localized in general: by nerve cells know as *grid cells* and *place cells*:

"The medial entorhinal cortex (MEC) is part of the brain's circuit for dynamic representation of self-location. The metric of this representation is provided by grid cells, cells with spatial firing fields that tile environments in a periodic hexagonal pattern… The discrete topography of the grid-map, and the apparent autonomy of the modules, differ from the graded topography of maps for continuous variables in several sensory systems, raising the possibility that the modularity of the grid map is a product of local self-organizing network dynamics."

"One of the few non-sensory systems with sufficiently distinct behavioural correlates to investigate structure–function relationships is the hippocampal–entorhinal space circuit. Many neurons in this circuit have known spatial firing correlates. 'Place cells' in the hippocampus fire only when animals visit certain locations. These cells are probably generated, in part, from grid cells in the MEC, one synapse upstream. Grid cells have multiple periodic firing fields, arranged for each cell in a hexagonal lattice that provides the network with a metric that place cells do not have on their own. In both the hippocampus and the MEC, different cells fire at different locations, such that, collectively, the cells form neural maps of all locations in local space. These maps are different from sensory maps in that spatial firing fields are not derived by extraction of features from a particular sensory input, but probably originate from pattern-formation processes in the circuit itself [Stensola *et al*, pg. 72]."

As noted earlier, processes of positional localization can be effectively applied when analyzing non-phonetic forms of writing.

Positional localization is functionally implicated in the neural processes which intuit facial composition from differential contrasts; and taken together, the *différance* of differential image elements and the differential contrasts that define facial composition yield a grammatological functionality from positional localization which in turn imparts a semiological nature to the differential image elements that form the facial composites found in anametric image writing.
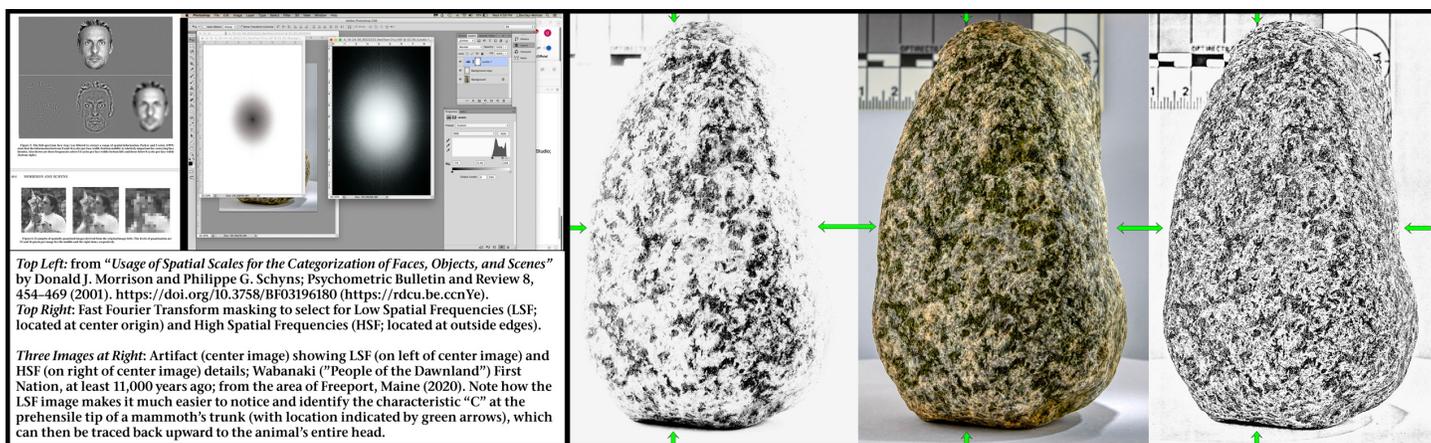
We have yet to see how this process of grammatological definition for semiological elementarity might extend beyond a context of faciality. Some indication of how this might proceed is provided by the possibility of neural processes grounded in grid cells and place cells replacing the functions of positional localization afforded by facial recognition; and initial, tentative explorations have provided some indication that this might be the case.

One technique frequently employed in clinical studies directed toward exploring the neurology of visual processing is that of the Fast Fourier Transform, which is used to convert pixel-based images into frequency-based space. Once converted into frequency space, images can be edited to display specific spatial frequencies — whether as fine details exclusively, large-scale visual contexts, or any spatial image structures in between. Converting an image edited in frequency-based space back into pixel-based space will return an image composed only of the spatial frequencies that it had been masked to accentuate.

Clinical studies use this approach, coupled with neural imaging technologies, to determine which areas of the brain process visual aspects composed of specific spatial frequencies: generalized backgrounds, for instance; or objects of a specific size; or details of visual texture; or, faces. Since I can photograph any examples I have of anametric image writing, I can convert these images into frequency-based space using a Photoshop plug-in filter for Fast Fourier Transforms provided by Chris Russ of Reindeer Graphics. Using a very simple approach outlined by Dr. John Russ in *The Image Processing Handbook*, I have obtained some very interesting results.

Starting with an example of anametric image writing from the area of New York City; and setting a baseline spatial frequency derived from the facial measurements of a Lenape Woman depicted upon that stone: I then used this baseline measurement to postulate related spatial frequencies for hypothetical grid cell modules, using multiplication

Top Left: from *"Usage of Spatial Scales for the Categorization of Faces, Objects, and Scenes"* by Donald J. Morrison and Philippe G. Schyns; Psychometric Bulletin and Review 8, 454–469 (2001). https://doi.org/10.3758/BF03196180 (https://rdcu.be.ccnYe).
Top Right: Fast Fourier Transform masking to select for Low Spatial Frequencies (LSF; located at center origin) and High Spatial Frequencies (HSF; located at outside edges).

Three Images at Right: Artifact (center image) showing LSF (on left of center image) and HSF (on right of center image) details; Wabanaki ("People of the Dawnland") First Nation, at least 11,000 years ago; from the area of Freeport, Maine (2020). Note how the LSF image makes it much easier to notice and identify the characteristic "C" at the prehensile tip of a mammoth's trunk (with location indicated by green arrows), which can then be traced back upward to the animal's entire head.

Above: image writing depiction of a Lenape Woman.
Below: spatial frequency pattern characterisitic of grid cells.
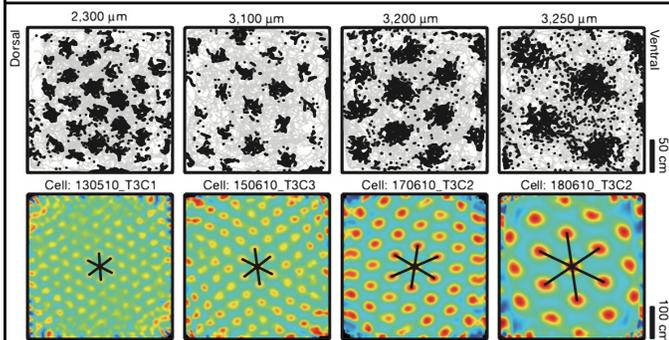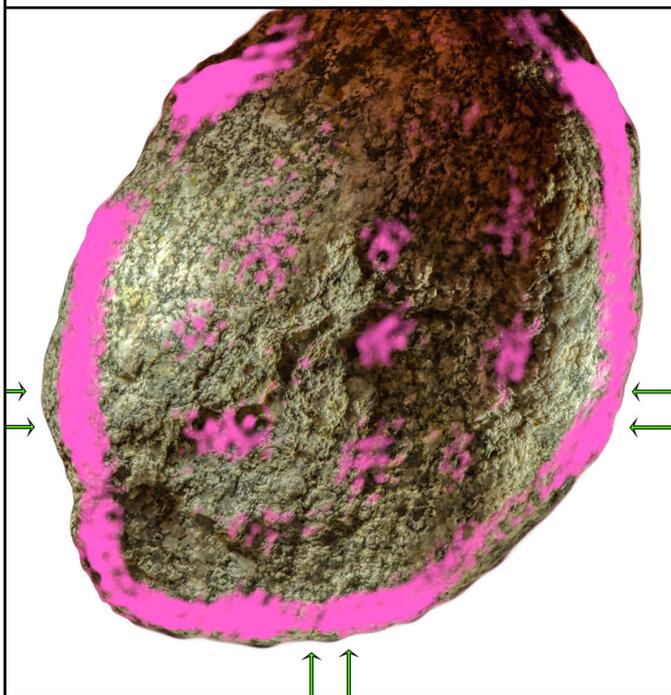
Above: grid cell patterns in neural imaging studies.
Stensola *et al*; *The Entorhinal Grid Map is Discretized*
in NATURE, 6 DECEMBER 2012 | Vol. 492

factors provided by Edvard Moser in his Nobel Laureate lecture (as given in response for being co-awarded the 2014 Nobel Prize in Physiology or Medicine, for the discovery of grid cells). Converting these several spatial frequency derivations back into pixel-based images and selectively editing them together yielded a pattern of organization which corresponds to that which active grid cells display in neural imaging studies.

Although much work remains to be done in verifying this result, and establishing a consistent methodology that can be applied comparatively to other examples, this tentative finding at least suggests that there may indeed be some affinity holding between the positional localizations afforded by facial compositions, and a more generalized process of positional localization functionally attributable to grid cell modules. If this should prove to be the case, then it might be possible to more fully explore the functional nature of the neurological processes that provide the grammatological structure for anametric image writing — and in doing so, to define the mechanisms which make this form of image writing communicative beyond the linguistic and cultural constraints in which it was produced.
In effect, the possibility that a trace of grid cell patterning remains inherent in the spatial frequencies which inform the image elements of this anametric image writing example suggests the possibility that the surface of the stone used as a mediating substrate was surveyed by the person creating images upon it in a fashion akin to a visual mapping of its surface. Such an approach to writing would be entirely consistent with a process that could be termed *substantiation*, such as Félix Guattari suggests proceeds from a material basis prior to processes of signification.

It would seem to be a "given" that there would be a very strong affinity of production holding between the manufacture of stone tools and the creation of anametric image writing, both of which utilize stone as a material substrate. This being the case, it should be expected that there would be a high degree of carry-over between these intentionalities of material production, which are both initially concerned with locating the material qualities within stone: those that are important for (in the first case) the creation of tools, and (in the second case), a comparable process of substantiation which surveys the stone surfaces used as a material substrate in the production of anametric image writing.

Engaging with indications of how substantiation occurs through a process of survey can provide

examples illustrating productive traces of concept creation in anametric image writing that are characteristic for the endoconsistencies which compositionally fuse together differential image elements.

Interestingly, I have noted that the examples of anametric image writing I have studied often contain an element of mapping, which is so integral to the formation of image composites that it supplies grammatological properties in its own right; and these aspects can be taken loosely as being indicative of the exoconsistencies that also characterize the creation of conceptual formations. But, there is no necessary definitional or structural relationship between the specific endoconsistencies and exoconsistencies of any concept: this compositional linkage is strictly a matter of empirical contingency. It is the contingent nature of concept formation that allows substantiation as a process to invoke consistency as a guiding principle for tracing the contours of the real through the course of any existential survey.

That being said, it is always also the case that conceptual composites exhibit both endoconsistencies of internal component fusion, and, exoconsistencies of the bridges and linkages which hold with other conceptual composites. It is through the nature of the contingencies which link endoconsistency and exoconsistency in concept formation that we find the semiological and grammatological principles that inform anametric image writing in its engagement with the real through survey, substantiation, and positional localization.

Neural Correlates of Spatial Localization

I would suggest that, in the context of anametric image writing, it is possible to examine how mapping and positional localization correspond to semiological functionalities — and to do so in such a way as to demonstrate how baseline neurological commonalities enable this form of image writing and thus allow it to function for those who intend to read it, regardless of their cultural background or the era in which they live.

As it turns out, the process of positional localization noted with respect to the semiological functioning of image elements found in the context of facial composites examined above is in fact integral with the kind of variant input noted of the differential contrasts that function in facial recognition — which is entirely consistent with the

way in which grid and place cells might be expected to perform when contributing to semantic (semiological) processes:

"The modular organization of grid cells may further influence how information is processed and stored downstream in the hippocampus. If hippocampal place cells are excited by convergent input from multiple grid modules, two types of effects can be envisaged. First, convergence of signals from multiple grid modules would prevent propagation of noise that is uncorrelated across modules, allowing the hippocampus to estimate location with a precision that exceeds that of the individual grid modules. Second, such convergence might facilitate the formation of new and unique representations for new environments. If converging modules respond independently to displacement or reconfiguration of the environment, the altered co-activity may activate a new subset of hippocampal neurons at each location in the changed environment. A similarly effective redistribution would not necessarily be seen if the entire grid map responded coherently. Computational simulations have shown that convergence of signals from only 2 to 4 independently aligned grid modules may be sufficient to obtain near-complete remapping in downstream place cells. Each change in relative phase and orientation among a set of grid modules might lead to a unique hippocampal activation pattern, suggesting that the number of distinct representations that can be formed is large. By combining input from a small number of independently operating grid modules, hippocampal cell populations may thus acquire the ability to generate discrete representations individualized to specific places and experiences, an ability that may lie at the heart of the contribution of the hippocampus to episodic and semantic memory formation [Stensola *et al*, pgs. 77–78]."

Traces of organization patterns that are characteristic for grid cells appear to be inherent in the distribution of spatial frequencies imparted onto the surface of the mediating substrate for at least one example of anametric image writing. The trace of this pattern was revealed by postulating the spatial frequencies for hypothetical grid cell modules as derived from a baseline measurement drawn from a distinct facial image area noted

within this example of anametric image writing. Stensola *et al* speculate that grid cell modules may be directly implicated in the formation of episodic and semantic memory; and as noted earlier, anametric image writing is distinguished by durational grouping patterns that compose grammatological contexts of meta-narrative — a phenomenon that occurs in the confluent articulation of episodic and semantic memory.

It appears possible to tease from these spatial frequencies that I assigned to hypothetical grid cell modules something of even greater interest. Consider where Stensola *et al* suggest above:

> "If converging modules respond independently to displacement or reconfiguration of the environment, the altered co-activity may activate a new subset of hippocampal neurons at each location in the changed environment."

Although the scalar variance between grid cell modules is generally considered to be directed toward survey and mapping undertaken for different distance ranges of experiential spaces, other neural processes (such as: edge-distinguishing border or boundary cells; head direction cells; speed or velocity-of-travel cells; and so on) also offer input along with grid cell modules for the cumulative formation of place cell activations.

It is possible, then, that grid cell modules function not only to integrate spatial awareness at different scales of distance ranges: grid cell modules may also, through their co-extension of related activations, serve to articulate different kinds of neural differentiations.

This additional determination of functional activity for grid cell modules would offer a direct explanation that describes something immediately seen in anametric image writing, with respect to differential image elements: that two co-incident positional localizations, such as the eyes in a facial composite, could be defined by schema of very different spatial scales — for instance, an arrow head and a deer. It is a given in the aforementioned example that this can and does make episodic and semantic sense; but why this would be so, still demands a functional explanation — and one which would seem to implicate both positional localization and relational scale. In this, grid cell modules would appear to be viable candidates, even beyond what could be expected of the differential contrasts which facial recognition compositionally supports. Such a possibility seems to be indicated by clinical

studies directed toward determining how grid cell modules actually function:

> "…cell populations with different grid properties were found to respond independently to changes in the geometry of the environment, indicating that modules of grid cells can be anchored separately to external cues or boundaries. The discrete but interspersed topography of the grid map, and the apparent autonomy of the modules, differs from the graded topography of maps for continuous variables in well-studied sensory systems, such as the orientation and direction maps of the feline, weasel and primate visual cortex."
>
> "This proposed correspondence between velocity of movement and displacement in the neural sheet can only be maintained if the local network has a common grid scale and grid orientation, that is if the network is organized into discrete space and orientation modules. The present work confirms this prediction. By showing that grid modules with different spacing and orientation can interact independently with the environment, the present study further raises the possibility that the MEC comprises multiple path-integrating grid networks, each operating at a unique grid scale, possibly as the result of a unique amplification of incoming speed signals [Stensola *et al*, pg. 77]."

Examining the results of spatial frequency analyses for Fast Fourier Transforms that generate hypothetical ranges for grid cell modules does appear to give some support to the idea that grid cell modules can function in a way which articulates other neural processes into composite assemblages. Note in the example that follows (on the next page) how integrating together hypothetical grid cell modules of progressively smaller spatial frequencies yields something quite different than more compact versions of the grid cell patterns seen in example *2a*. In the second example, *2b*, it appears that the distribution of spatial frequencies has begun to deviate away from the standard matrix of a hexagonal grid cell pattern, and toward linear sequences more characteristic for border or boundary cells. With the third example, *2c*, something even more striking can be seen: here, the alternating pattern of light and dark areas that occur in linear sequences is most suggestive of something very identifiably distinctive. Here, it is possible to discern the productive methodology employed in the manufacture of edged stone tools, where the
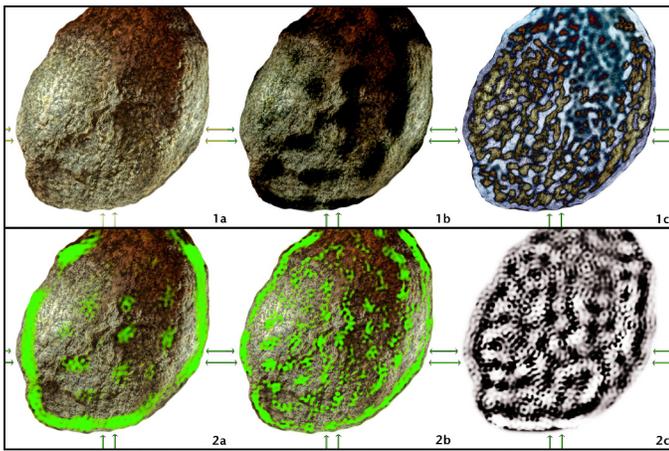
TOP ROW: *1a)* Stone under consideration. *1b)* areas selected by excluding low spatial frequency grid module. *1c)* Continguous areas of spatial freqiuency selected, with inverse areas distinguised as difference.
BOTTOM ROW: *2a)* Spatial frequency of selected image area (Lenape woman's face) divided by the spatial frequency of the hypothetical next-largest grid cell module, leaving only areas of the larger spatial frequency which do not overlap with the periphery of the baseline spatial frequency originally selected. *2b)* Hypothetical next-smallest grid module's spatial frequency divided by the baseline spatial frequency, leaving only areas of the baseline which do not overlap with the periphery of the grid module expected to provide detailing of the baseline image areas. *2c)* Coverage of three hypothesized grid modules combined as their spatial frequency outputs.

systematic flaking of a stone's edge creates the sharpened working surface that defines a tool's utility.

In this, we can see the trace of material production which typifies the process of substantiation, as the raw matter of a stone is assessed for the specific qualities that determine how it can be modified into a tool: the friability of the stone, its cleavage planes, its weight and balance, and so on.

Something else can be seen here though: the sequences of apparent edging also roughly outline image areas of facial grouping patterns. Through this, we can see the co-incident articulation for both forms of substantiation noted earlier: the material production of tools, and, the conceptual production of anametric image writing. It appears that the productive methodology which typifies the manufacture of stone tools has been mapped directly into the creation of composite image patterns.

These observations made with regard to the functional nature of grid and place cells are in fact not very far removed from what we know about the way that facial recognition functions, bringing us very close (within the context of anametric image writing) to understanding how the shared neurology of visual processing can establish the grammatological structures necessary for the comprehension of such a form of non-phonetic writing — thereby establishing a solid neurological foundation for understanding how highly conceptual information can be conveyed through this form of non-phonetic writing:

"A final point of interest is the fact that neurons in the face patches are just a couple of synapses away from the medial temporal lobe (MTL; the hippocampus and surrounding cortex), where, in humans, neurons were found to encode concepts, responding in a very selective and abstract way to specific persons or places (Quian Quiroga et al., 2005). More recently, it was also shown that these neurons respond to related concepts, thus encoding meaningful associations in a high-dimensional cognitive space (De Falco et al., 2016). The encoding of such associations has been proposed to be the basis of declarative memory functions (Quian Quiroga, 2012), and compared to the coding showed by Chang and Tsao (2017), one can pose a fascinating question: how does the brain go from a perception-driven representation of features in the face patches to a memory-driven representation of concepts and their associations in the MTL? One possibility is that there is a fundamental difference between species or, alternatively, that such difference is given by the fact that, for humans, the faces of people we know (to which MTL neurons tend to respond) convey meaning with associated memories and emotions, compared to the "meaningless" faces that were used for these experiments with monkeys, with the former type of stimuli giving a representation (like the exemplar-based model) closer to the one found in the human MTL. Another more thrilling possibility is that the exquisite structure of the hippocampal formation—and particularly, the recurrent connectivity in area CA3—gives rise to a major change in the metric space and that such change provides in turn the substrate of two different, though intrinsically related, functions: perception and memory [Quiroga, pg. 976]."

That we might begin to better understand how our functional neurology allows us to create a sense of the world around us and then communicate this between ourselves, is a tantalizing prospect offered in the promise that a thorough study of anametric image writing holds — and this, beyond the obvious merit of accessing an incredible depth of historical knowledge unexpectedly made

available where none was suspected to exist.

Between Faces Seen and Unseen

Ironically, the most common rationalization I have encountered by those discounting my research into (and indeed, the very existence of) anametric image writing actually speaks to a core component grounding the value such a study holds; for while some would dismiss my work as simply a manifestation of pareidolia (the illusory perception of non-existent faces), it was through the study of prosopagnosia (also called face blindness, an impairment in the recognition of faces) that the realization of the role played by differential contrasts in facial recognition was reached. As it turns out, the perception of facial structures is an established and integral function of visual processing neurology:

> "Now that we understand face patches, we can begin to train animals to imagine faces and explore how neural activity is shaped by the purely internal act of imagination. Lots of new questions arise. Does the imagination reactivate the code for the imagined face in the face patches? Does it bring back even earlier representations of contours and shading that provide inputs to the face patch system? We now have the tools to probe these questions and better understand how the brain sees objects, imagined or real.
> "Because almost all the brain's core behaviors—consciousness, visual memory, decision-making, language—require object interactions, a deep understanding of object perception will help us gain insight into the entire brain, not just the visual cortex. We are only starting to solve the enigma of the face [Tsao, *Scientific American,* Feb. 2019, pg. 29]."

As insightful as the analysis of facial composites has proven to be for the study of anametric image writing, petty arguments prefaced upon assertions of "Well I don't see a face there" are seemingly swept aside when other neural processes, such as those which attend grid and place cells, are factored into an analysis of how this form of image writing might be functioning.

Comparing recent advances in research, undertaken with respect to the neural processes supporting facial recognition and spatial orientation, we find that: Contrast differentials are composited into patterns of recognition through grouping; and, that multiple inputs are processed through neural patterns of different scale. If we consider that grid cell modules might be functioning semi-independently of each other, by mapping very different aspects of surrounding environments and integrating these together (rather than simply being constrained to relativizing different scalar ranges of spatial measurement), then this could facilitate a compositional functionality which would output results that are potentially fractal in nature: If any grid cell module could potentially integrate ancillary neural processes with processes ancillary to any other grid cell module, then a composite variability would result that vastly exceeds anything which could possibly be produced strictly from simple scalar ranges of module variance, as dedicated exclusively to mapping distances.

One factor that both of these considerations (differentials of facial composition, and variant scalar modulations as integral in nature) have in common is that of positional localization — which also appears to be the operant factor defining a core semiological function whereby "one thing appears in the place of another." In particular, it can be noted that such positionally localized substitution takes place irregardless of scalar relationships: image outlines of very large objects can take the place of much smaller image elements in a composite structure (such as a face), and objects of very different actual size can appear as if similar in size. This strongly suggests that, in anametric image writing, the differential contrasts of positionality found in facial recognition are being augmented by a process of localization which is characterized by discretely variable scalar relation; and this in turn seems to implicate somehow the functional nature of grid cell modules.

Finally, it seems that the aforementioned processes will output into other neurological functions in such a way as to carry forward into the production of memory-based semantic and conceptual formations, which are in turn integral to consciousness as we experience it directly.

It is thus my contention that there is adequate evidence to suspect that anametric image writing can indeed support the creation and communication of conceptual information, regardless of any relationship holding with phonetic patterns of speech. Indeed, a case might be made that anametric image writing could have been a developmental factor in the evolution of the many different spoken languages of the First Nations in North America, as we do indeed know instances of these where "incoming speed signals" differentiate the way in which concepts are formed:

"In English we divide most of our words into two classes, which have different grammatical and logical properties. Class 1 we call nouns, e.g., 'house, man'; class 2, verbs, e.g., 'hit, run.' Many words of one class can act secondarily as of the other class, e.g., 'a hit, a run,' or 'to man (the boat),' but, on the primary level, the division between the classes is absolute. Our language thus gives us a bipolar division of nature. But nature herself is not thus polarized. If it be said that 'strike, turn, run,' are verbs because they denote temporary or short-lasting events, i.e., actions, why then is 'fist' a noun? It also is a temporary event. Why are 'lightning, spark, wave, eddy, pulsation, flame, storm, phase, cycle, spasm, noise, emotion' nouns? They are temporary events."

"In the Hopi language, 'lightning, wave, flame, meteor, puff of smoke, pulsation' are verbs — events of necessarily brief durations cannot be anything but verbs. 'Cloud' and storm our at about the lower limit of duration for nouns. Hopi, you see, actually has a classification of events (or linguistic isolates) by duration type, something strange to our modes of thought. On the other hand, in Nootka, a language of Vancouver Island, all words seem to us to be verbs, but really there are no classes 1 and 2; we have, as it were, a monistic view of nature that gives us only one class of word for all kinds of events [Whorf, pg. 215]."

Durations and dynamics of motion play a major role across many different instances of First Nations languages, both spoken and written; and they do so in a way not seen in the temporally tripartite verbal forms found (through a division into past / present / and future) as integral to the standard grammatological structure of European languages.

A Map of Ages

The first example of anametric image writing I found caught my eye by the circular pattern of marks on the top of that stone, spotted as I walked down a gravel logging while hiking in Bute Inlet, British Columbia, Canada in 1991.

It was several days later, after I had returned to Vancouver and upon closer inspection, that I noticed the very distinctive face upon what I now take to be the front of this stone — the first of

many image composites I would note.

In 1993, while conducting further field work on an island not very far from Bute Inlet, I found two other stones that each had, along with many other image patterns, an image composite which seemed to reference the primary face noted on the first example I had found — suggesting that this face, with its characteristic "Three Feather Headdress", depicted some historical figure who was renowned a very long time ago. Semiologically, this is an example of "iteration" — the recurrence of a symbol that indicates its use as a sign for something or someone. Interestingly, though, the way in which this depiction of "The Three Feather Chief" occurs shows something that "differs from itself without being other than itself" — a situation more akin to the experience of consciousness itself than it is to processes of phonetic signification.
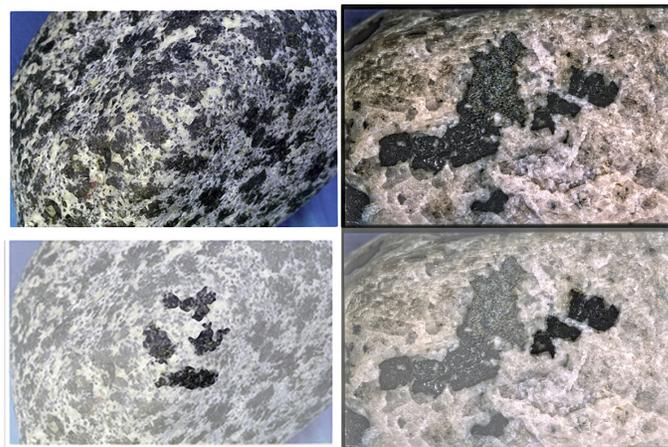
Continuing my field work, over the winter of 1997-98 I came upon many other examples of anametric image writing while living on some of the Southern Gulf Islands between mainland British Columbia and Vancouver Island. One of these stones showed a very beautifully etched horse, particularly evident by firelight. The stone itself was sculpted as the strangely shaped head (possibly, a giant sloth?) which is also shown beside the head of a horse on one of the stones (which I call the Map Skull Stone) that I had collected in 1993.
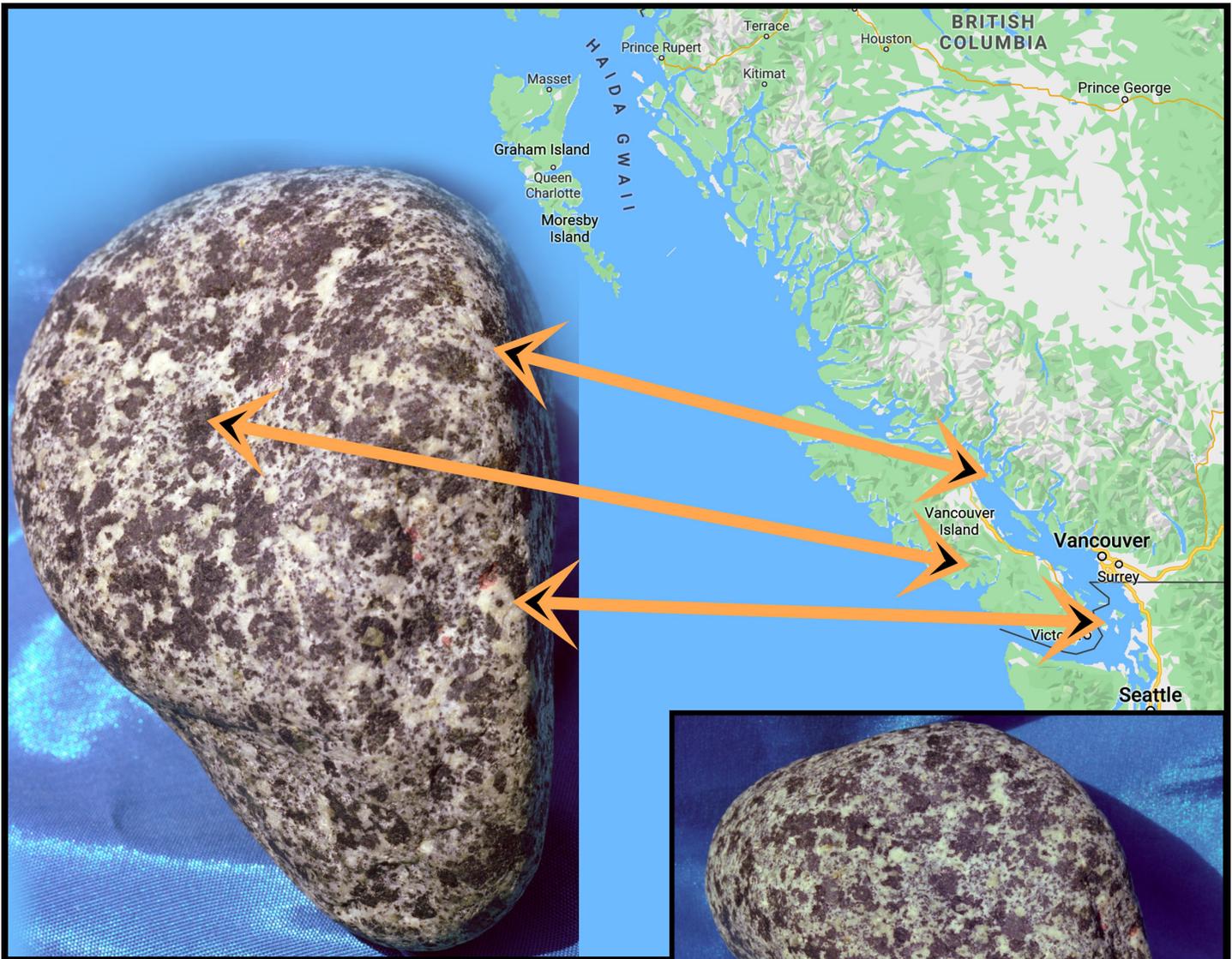
Another find of great importance from that winter turned out to be a stone astrolabe. This functions by setting it toward the sun at noon (aligning the leading edge's shadow with a target mark by using a sighting notch) and noting the images that are then shown as the sun slowly crosses its concave surface. As the height of the sun at midday varies through the year, cyclical events (such as the seasonal availability of food sources) could be selectively highlighted at appropriated times.
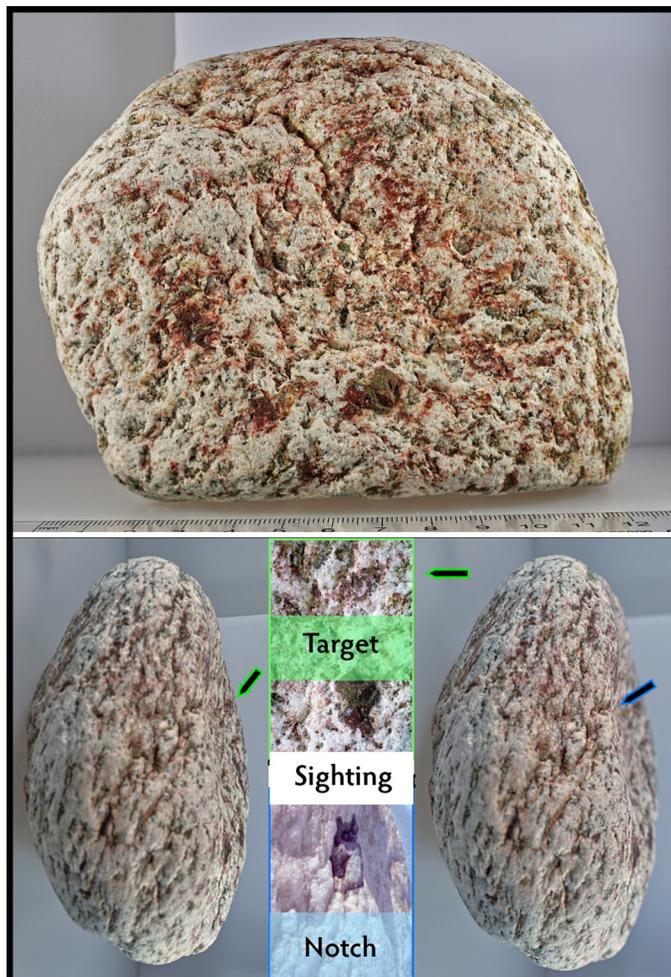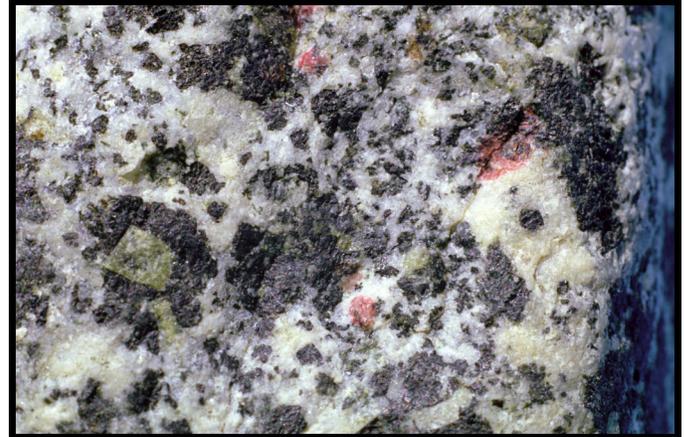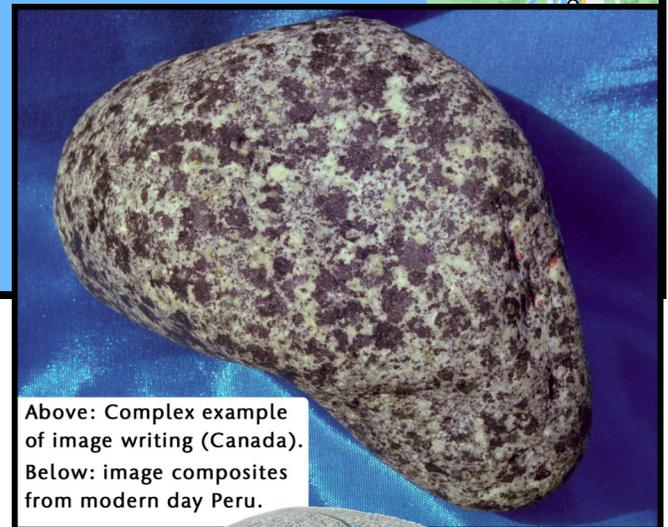

This stone also has angled lines etched upon its concave surface; and if these lines are assumed to represent the height of the sun at solstices and equinoxes, then something very interesting can be seen: the range of variance in the angular displacement of these lines would then indicate that this stone had been used in three vey different locations: farthest south, at the mouth of the Columbia River; farthest north, at the mouth of the Skeena River (or on the islands of Haida Gwaii); and in between, somewhere in the region of the Barkley Sound on the west coast of Vancouver Island (a location where the Alberni Inlet stretches far inland, through the mountains of Vancouver Island almost to the island's eastern shore).

If we take a map of British Columbia, it is possible to: 1) correlate the northern position at which the Map Skull Stone (that depicts the Three Feather Chief, as well as the, um, "Sloth" and Horse) was found; 2) correlate the southern position where the Firelight Horse Stone was found; then 3) infer from the map of British Columbia where the Alberni Inlet would be positioned, relative to the other two locations already correlated (when we locate that position on the Map Skull Stone, it correlates to the Map Skull's dominant eye).
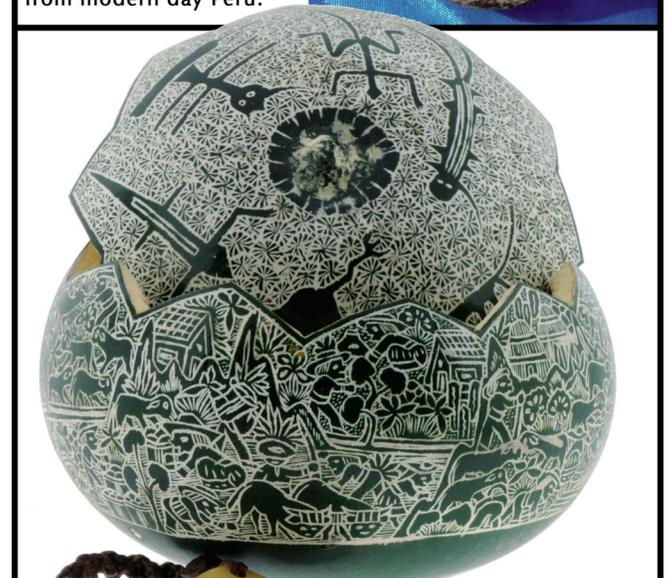
Above: Complex example of image writing (Canada).
Below: image composites from modern day Peru.

This would imply that: The front edge of the Skull Map Stone corresponds to the Salish Sea (Georgia Straight), between Vancouver Island and the mainland; the flattened eye-socket area on the left of (when facing) the Map Skull Stone corresponds to Vancouver Island; and the main part of the Map Stone Skull correlates to the mainland and interior of British Columbia.

It would seem, then, that the First Nations of North America were both writing about, and mapping their traditional territories a very, very long time before Europeans arrived. If the First Nations were indeed creating maps of the first areas in which they arrived when they crossed over into North America, it would seem likely that they would have then carried whatever techniques they employed for this with them when they moved further out into continental North America — and beyond.

An example I found (*above, right*) in Ottawa, Ontario, Canada (over 2,000 miles from coastal British Columbia), although showing variance in the patterns of image composition it presents from that seen on examples from the Northwest Coast, does share one very basic characteristic with the Skull Map Stone from British Columbia (*above, left*): that of circular composition in the image patternings it presents. As early as 1994, I was postulating that a system of mapping might have been in use by the First Nations that utilized a mapping grid of interconnected circles, as extrapolated from a model devised of encounters with an Arctic phenomenon known as "Patterned Ground"; and that the First Nations might have used this as a template for mapping their territories, using the commonalities of due south (as determined from sun height at midday) and latitude established by sun height at midday on an equinox, and, angular displacement of shared landmarks upon the horizon relative to due south at midday — as determined from "sighting circles" (often now called "medicine wheels" — see Appendix A).

Below, left: Patterned ground would provide a paradigmatic external example for establishing the exoconsistency of a conceptual mapping system.
Below, right: Grid cell modules, with their characteristic hexagonal arrangement pattern utilized for mapping space, would provide a paradigmatic internal organization establishing the endoconsistency for a conceptual mapping system.
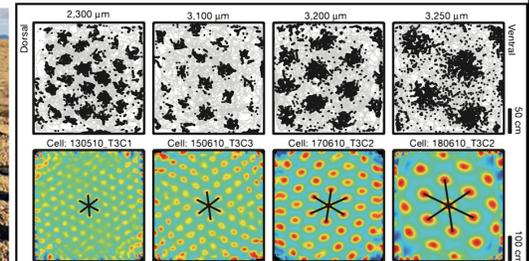
Patterned Ground Images sourced from, http://www.geo41.com/extreme-environments/

Above: grid cell patterns in neural imaging studies.
Stensola et al; The Entorhinal Grid Map is Discretized
in NATURE, 6 DECEMBER 2012 | Vol. 492

The physics and the geometry which would enable this are never in dispute; and indeed, at least one traditional story collected from a Coastal First Nation not long after Europeans began to colonize British Columbia demonstrates knowledge concerning the degree of angular displacement associated with great distances (see Appendix B).

While this assessment can be dismissed as speculative, consider for a moment the primary question that has been guiding my research — that of the neural processes held in common which can allow a person from a modern cultural background to understand concepts created and incised upon stone by people long ago, from within a completely different cultural context. Consider, then, research conducted over the last decade or so that has finally revealed the role played by *grid cells* and *place cells* in processing spatial location:

> "In the presence of external excitatory drive, neural activity in an inhibitory network self-organized into a stable hexagonal pattern. Competitive inhibitory interactions drove activity to maximally spaced positions. As in the earlier excitatory models, a path integration mechanism could be used to move the activity bumps across the neuronal lattice in accordance with the animal's movement. The emergence of grid patterns in purely inhibitory networks is also shown in a previous study with Mexican-hat connectivity where inhibition decreases progressively as grid phases get more similar."

> "The entorhinal representation of space is complemented by a map of place cells in the hippocampus. A striking difference between grid cells and place cells is that place cells, unlike grid cells, often remap completely between environments and even between experiences in the same environment. Whereas ensembles of grid cells exhibit spatially coherent firing patterns across tasks, the active subset of place fields may be almost completely replaced, and among cells that are still active, the combination of firing locations is usually different. Thus the entorhinal-hippocampal circuit has two maps of space – one expressing the metrics of the environment independently of its specific configuration of landmarks (grid cells), and one consisting of semi-orthogonal representations unique to individual environments (place cells); that is, a map of space in general and a large number of maps for particular spaces [Moser, pg. 475]."

Consider for a moment the structural similarities between: instances of patterned ground; the circular patterns of image elements found upon complex examples of anametric image writing; and the depictions of neural activity that transpires when grid cell assemblages are activated:
I do not think it at all unlikely that anametric image writing could be created in the experiential space holding between an external example such as patterned ground (as an expression of conceptual exoconsistency), and an internal neurological tendency to process spatial relationships through grid patterns (as the realization of conceptual endoconsistency). It isn't difficult to see how such a relationship would lend itself to the creation of anametric image writing, as grounded in functional neural tendencies for processing environmental stimuli.
Indeed, the relationship between grid cells and place cells would appear to parallel that holding between the mapping system that underlies anametric image writing, and the processes of positional localization that support its semiological functionalities.

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Ancillary Texts

Grid Cells, Place Cells and Memory
Nobel Lecture, 7 December 2014
by May-Britt Moser
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Spatial Cells in the Hippocampal Formation
Nobel Lecture, 7 December 2014
by John O'Keefe
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okeefe-lecture.pdf

Grid Cells and the Entorhinal Map of Space
Nobel Lecture, 7 December 2014
by Edvard I. Moser
https://www.nobelprize.org/uploads/2018/06/
edvard-moser-lecture.pdf
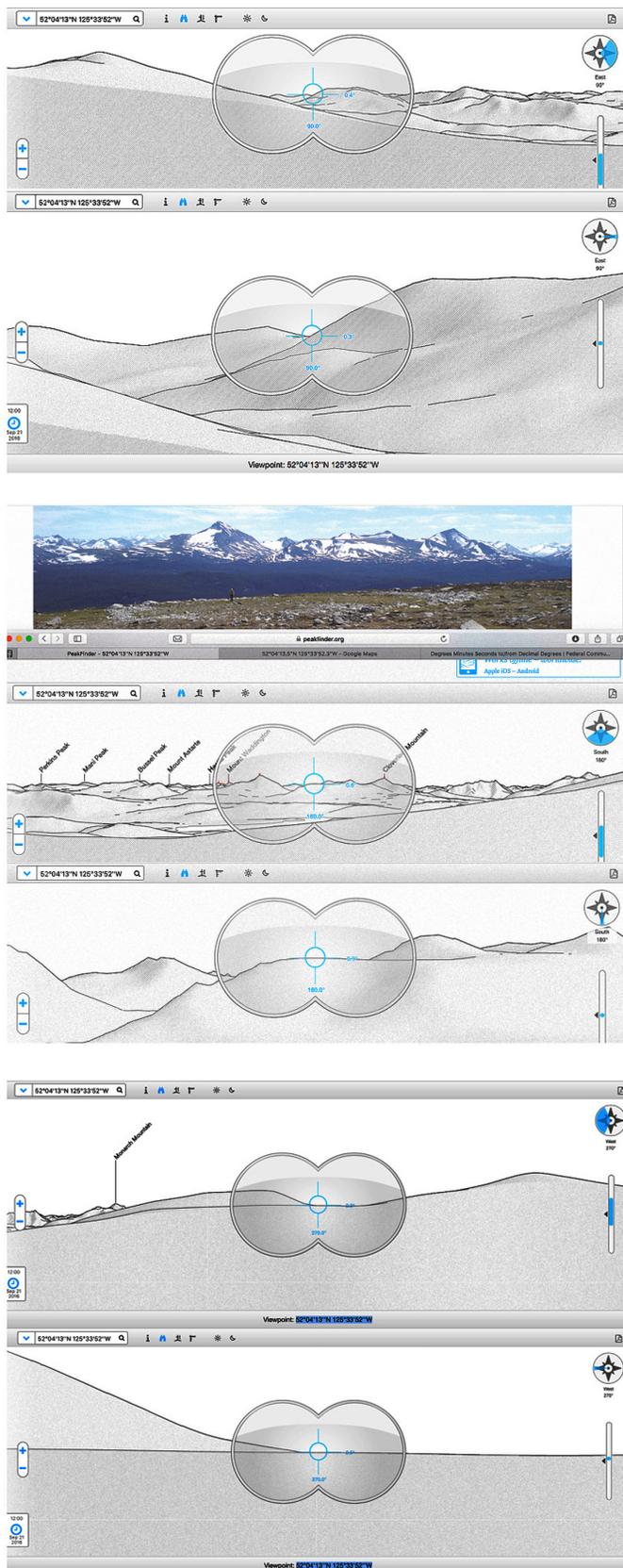
APPENDIX A:
A Stone Sighting Circle in Coastal British Columbia visible on Google Maps.
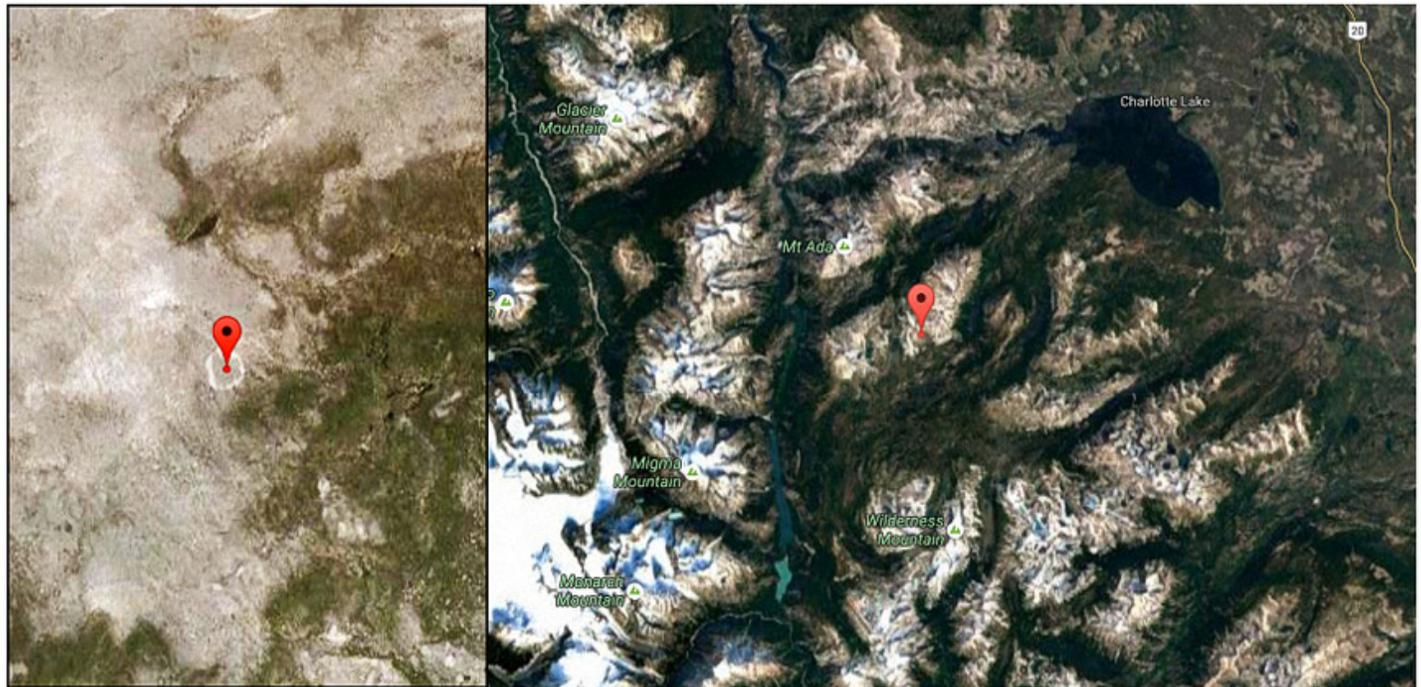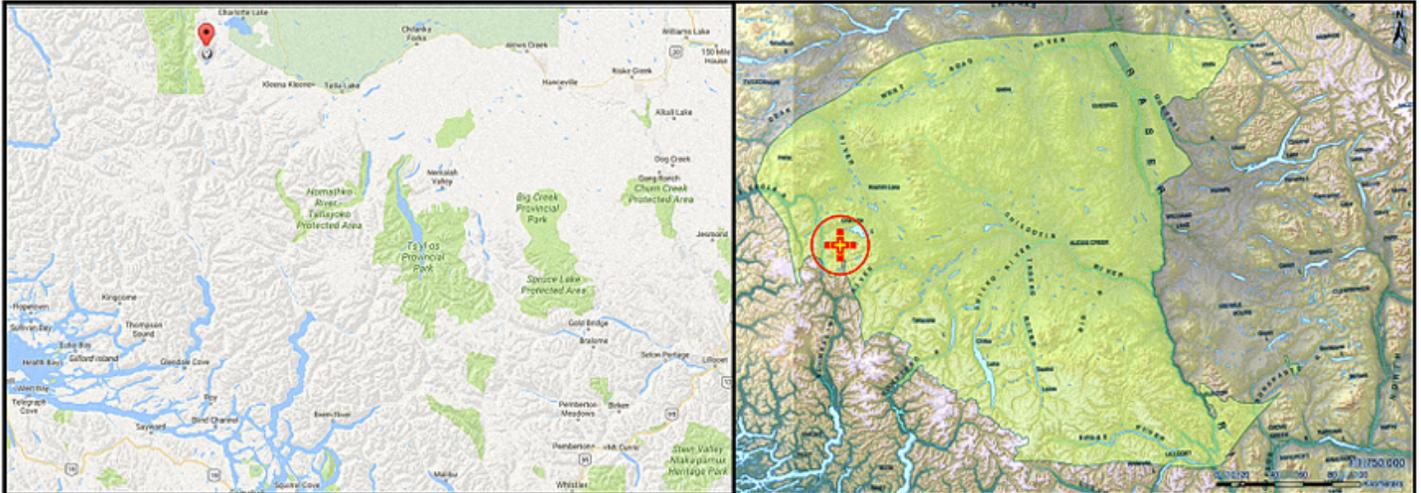
Previous Page:
Location of a stone Medicine Wheel, as seen on Google Maps.

Below:
Line-of-sight horizon for due east; due south; and due west.

Turning our attention to the east from this location, we immediately find a very distinct and significant alignment. It is readily apparent that, on either equinox, the sun rises exactly at a very distinct notch in the visual horizon. This is a major astronomical alignment: the equinoxes signal the end of winter and the end of summer. The point on the horizon where the sun rises on an equinox is also always due east, everywhere; in cultures around the world, this point has special — often spiritual — significance.

If we then look due west from the stone circle, we find that on the equinoxes the sun sets precisely at the bottom of a very distinct slope on the visual horizon. This gives us two major astronomical alignments for the position of this stone circle — due east and due west on the equinoxes — and possibly a third, depending on how the light falls at midday on the elevations of the facing slope due south of this location. At this point, it becomes apparent that this "stone circle" is most probably a Medicine Wheel which was indeed used to survey the surrounding territory, for the purpose of mapping the terrain.

The position of this Medicine Wheel is clearly intentional; and the chances of any place having three cardinal alignments, with each localized at an easily spotted position on the visual horizon, is small enough that we can certainly see why the placement of this Medicine Wheel was important enough to warrant whatever effort was required in placing the stones it is composed from at such a remote and inhospitable location.

One very handy tool available online that I often use is *The Photographer's Ephemeris*. With this, one can pick any point in the world and find line-of-sight references for sunrise, sunset, moonrise, and moonset — for any day of the year. Entering the coordinates for this Medicine Wheel, and setting the date at the Midwinter Solstice, we are given the exact coordinates for the rising and setting sun — which we can then use in Peak Finder, to see if there might be any significant alignments on the visible horizon at the Midwinter Solstice for this Medicine Wheel. There are; and, they are even more pronounced that those noted for the equinoxes. Evidently, members of the First Nations placed this Medicine Wheel where they did because it had multiple significant alignments here — including one for the Midwinter Solstice, which would have required them to attend this location during the shortest days of the year.

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APPENDIX B:

The following story was collected by Franz Boas during a series of trips undertaken to the Northwest Coast, generally with Victoria on Vancouver Island as his base of operations. These trips were conducted in 1886, 1888, 1889, and 1890. My comments are inserted as indented paragraphs.

Legends of the Lukungun: The Wives of the Stars
"There was once a chief who had two daughters. During the summer the people moved to a camp where they fished for salmon. One day the girls went into the forest. At night they lay down among the trees and looked at the stars. The elder sister said, "I wish the big star up there (Jupiter) would be my husband." And the younger one said, "I wish the red star there (Mars) would be my husband." Then they fell asleep. When they awoke, they found themselves in a strange land. The stars had taken them into the sky. Now they saw that the stars were men."

[The period of time when Franz Boas conducted his fieldwork on the Northwest Coast were tumultuous for the First Nations, to say the least. Although there had been regular contact with Europeans from the 1700s onward, it wasn't until the beginning of the Cariboo Gold Rush, from 1860 through 1865, that a European presence on the Northwest Coast became pervasive. The end of the American Civil War in 1865 brought a large influx of American fortune seekers, and in part prompted the consolidation of British North America into the nation of Canada in 1867. British Columbia did not join Canada until 1871 — on the promise of a trans-continental railway. This railway was constructed between 1881 and 1885; so by the time of Boas first trip, regular trade and traffic with eastern Canada was an established fact — but the city of Victoria had first been colonized in 1843, so all of these changes had occurred within a period of about 40 years.
Along with the first European settlers had come the early Christian

missionaries — a curious collection of individuals that worshipped a man and his son, who lived in the sky. I don't think the missionaries identified them as Jupiter and Mars; but apart from Venus, which is visible only at dawn and dusk (because it is between the Earth and the Sun) — and of course excluding the Moon — these are the two brightest objects in the night sky.]

"The shiny star's eyes were sick. And what they had wished for came to pass. The stars became their husbands. The following day their husbands told them to go out and collect onions. But they forbade them to dig up the bulbs as is done on earth; instead, they were only allowed to cut off the stalks. To start with, the women obeyed, but one day the eldest sister said, "I simply must eat an onion again." She dug one up and to their amazement they were looking down upon the earth through the hole."

[It is difficult to say why the sky people had sick eyes, or what the effect of this sickness might be — apparently, we might assume, they could not see certain things that members of the First Nations held to be readily apparent. We do know that the early missionaries did their best to suppress any First Nations cultural practices that they could: indeed, it seems that examples of anametric image writing were misidentified as gambling dice (because they were small, round, white objects with black dots) — and their possession was forbidden by missionaries, as "tools of the devil."
Oddly, though, the oral storytelling of the First Nations was still encouraged — but in a certain fashion. Very early along in the history of European contact with the First Nations, Jesuit missionaries had taken to collecting Indigenous stories and "translating" them — with the addition of elements taken from the Bible, such as great floods and such. The idea was to convince their superiors in Europe — particularly in Rome — that the First Nations were not a people forsaken by

God, and were deserving of help from Christian missionaries. It wasn't long, though, before the "adapted" stories were being translated back into First Nations languages — to serve as an introduction to the Bible, and to insert Biblical themes into First Nations culture.

All of which must have seemed very strange to members of the First Nations: after all, there would always have been a direct connection between anametric image writing and oral storytelling. One would expect that spoken stories would grow from any reading of anametric image writing; much as, say, an onion sprouts new growth — even as it builds up layer upon layer in its bulb. Layers, like those found from the Second Material Epoch of anametric image writing onward; that is, the era when the Stone Astrolabe was constructed — when the survey and event mapping of traditional territories was an accomplished fact.]

"When they arrived home, they didn't say anything about this. They still went to the forest as before to gather onion stalks. But now they made a long rope there, without anyone knowing about it. When they thought that it was long enough, they made a big hole in the ground and the oldest daughter crawled down. She said to her sister, "You wait here. When I have arrived down there safely, I'll shake the rope; then follow me down. Otherwise assume that I've fallen into the sea." The younger sister then lowered the rope. At last the woman landed on Mount Nga'k-un (some miles above the upper part of Victoria Harbor). There, she walked back and forth over a long distance and pulled the rope to and fro. Thus she was able at last to shake it a little bit and her sister up in the sky felt some very weak movements."

[It is an interesting comment, and a telling part of this story: that with a very long rope, one must move across very large distances to make even the slightest change at the far end. This is exactly the kind of insight that would have long been established as integral to the practices of survey and mapping that underlay the creation of event maps within anametric image writing — an immediate familiarity with the relationship between angular displacement and distance relative to shared reference points ("Sacred Mountains") on a visual horizon.]

She tied the rope to a tree up there, clasped it with her hands and legs and climbed down. The elder sister sat down below and looked up. Finally she saw a small moving dot. It grew bigger and bigger and then she recognized her sister. Her legs had become quite crooked from climbing so long. She had scarcely arrived at the bottom, when the rope fell down. The people in the sky had missed the women and when they discovered the rope, they cut it.

[Whatever is being described here — and as Deleuze and Guattari note, concepts are not made out of nothing, they do not appear magically from nowhere — the "apparition" ('that which appears, insofar as it appears') of the second sister serves as a particularly apt description of positional localization, as it occurs in the creation of anametric image writing: a small black mark is noted; and its edges are enlarged, modified by removing progressively more of the surrounding white matrix of rock, until the area of black stone grain grows into the recognizable schematic outline of whichever image in consciousness motivated this productive activity.]

"Then the women went to their home. Their mother had quite forgotten them because they had been away for so long. Her hair had become gray and her eyes dim from weeping so much. They hide close to a pond. Soon, their youngest sister arrived to fetch water. Her hair was cropped because she still mourned for her lost sisters. So they stroked her hair and immediately it became long again. The girl ran back and said, "My sisters are sitting out there by the pond." The old people said, "Don't be silly," and forbade her to say this. She went out once more and, after she had seen her sisters again, she ran back and

repeated that her sisters were by the pond. When she said it for the third time, her mother beat her. So she went out again. Each time she came to the pond, her sisters stroked her hair and it became longer and longer. Then she ran back the fourth time, pointed to her long hair and said that her sisters had made it so long. So the old people thought that she might be telling the truth, after all. They went to the pond and found the women. The girls stroked their mother's hair and at once it became long and black again."

[Anyone familiar with the history of the Residential School System in Canada will find all too much that is far too familiar in this part of the story: children having been taken away from their parents; endless mourning at the loss; but also, a break between younger generations, and the old ways.
Members of the First Nations, both men and women, traditionally wear their hair long; and missionaries have always tended to frown upon this, and promote short hair. Often, cropping the hair of children closely was the first act of those overseeing the Residential Schools over their new charges — because it was a more European look for the children.
And it is interesting, too, that this element of violence has inserted itself into First Nations culture; because traditionally, children are allowed to do pretty much what they want to be doing, as long as they stay within the traditional range of the village where they live. Also of interest is the fact that the sisters are staying at a pool near the village: I certainly don't know many of the cultural connotations of this, but I do know from other stories that areas inland were considered removed from danger, since most interactions with others occurred along the sea coast. Certainly, most Europeans would have been encountered at tidewater in this period — it was a rare European who set out inland from the sea's edge; so I think it safe to say that areas inland were considered at that time to be more truly aligned with traditional culture.]

"A younger man who obeys the laws scrupulously, bathes frequently and has never touched a woman, is able to see the rope on Mount Nga'k-un. It is invisible for other people."
Franz Boas, "Indian Myths and Legends from the North Pacific Coast of America"; page 171. Translated from the 1895 edition by Dietrich Bertz.
Copyright 2002 by the B.C Indian Language Project and Dietrich Bertz.

A few additional aspects of this story stand out. Notice that all of the main characters are women — yet the final "summary" sentence refers to "a younger man"? That seems a bit odd, doesn't it?
How does "the moral of this story" become one wherein young men are admonished to bath frequently and not touch women — so that they can see the rope that connects up to the sky people? That is, the very rope that was used to ESCAPE from the sky people!
I mean, really: What's up with THAT?
Well, my reading of this story is that it is very much the product of a transitional period, wherein European culture is being imposed upon the First Nations — with both sides, to some extent, having their say. Note that in 1847, four years after the city of Victoria on Vancouver Island was first settled by Europeans: "Egerton Ryerson produces a study of native education at the request of the assistant superintendent general of Indian affairs. His findings become the model for future Indian residential schools. Ryerson recommends that domestic education and religious instruction is the best model for the Indian population. The recommended focus is on agricultural training and government funding will be awarded through inspections and reports."
This was Official Government Policy, from the time of the first European colonists on the Northwest Coast onward: a policy embraced and upheld by the Christian Churches and their missionaries — for a profit.