Notebook

Looking to Draw

Mariah Lookman, 2013

Contents

Looking to Draw is about confronting the image of the body as it is molecularized under the optically aided eye of the biotechnologist.

Split between mind and body, appearance and material realities, ideas for this work began to form when I started to peer down microscopes and look up at monitor screens in the hope to make sense of measurable configurations of the human body.

I thought I understood pictures, but these were different. Chemical composition graphs, and indecipherable sets of numbers, combination of symbols and letters, were equally impenetrable.
The dynamism brought about by the known unknown, the mixing of personal observation with hard sciences, was at first unsettling.
It led to the realisation of the body simultaneously singular, simultaneously multiple, and amazingly out of control.
And, in this way
I imagined I became instantly cellular.

To adjust to the scale shift, and to make sense of the scattering caused by an understanding of biological makeup at the molecular scale, I started to make drawings as a means to register conscious thought on a previously un-thought scale.
Medical knowledge of the body transformed perception.
Visualised as cells and molecules, living organisms became metamorphosed, transmuted into bits of information.
It made me see matter differently.

The living body I realised could be many things.

To explore the notion of presence at the cellular, to probe into the function of images, the violence permeated through the abilities of images to show, represent, to mark, to measure and to aggregate knowledge of the human body, I started to make drawings.
The activity of making that followed is the awakening of perceptual parameters in the most expansive way.

To sum up simply, it is the process of unmasking, of thinking with a pencil.

Pencil

Compared to the amazing bits of computational hardware available to the scientists, I chose to pick up the pencil.
Pencils are easy, pencils are economical.
A contrast to scientific imaging, pencil drawings do not have to be defined by technological parameters that are strictly explicable, and mathematically valid. And still they can have in them the potential to become everything that can withstand scrutiny by logic.
It is a fact, in many instances, they form the first steps to cognize things to become.

A pencil can function as tool for measurement.
To do: stretch the arm out, hold pencil between the fist and the thumb, half close the eyes, and transform the pencil into a scale to measure and map all that is within focal length.

As an invention, a pencil is instrumental in the activity of all design. It is the most perfect tool for the practice of hand eye coordination.

With the pencil, it is possible to draw everything that can be seen, combined with everything that can be imagined.
With a pencil it is possible to register, to mark and leave a trace, as though a direct record of living time.

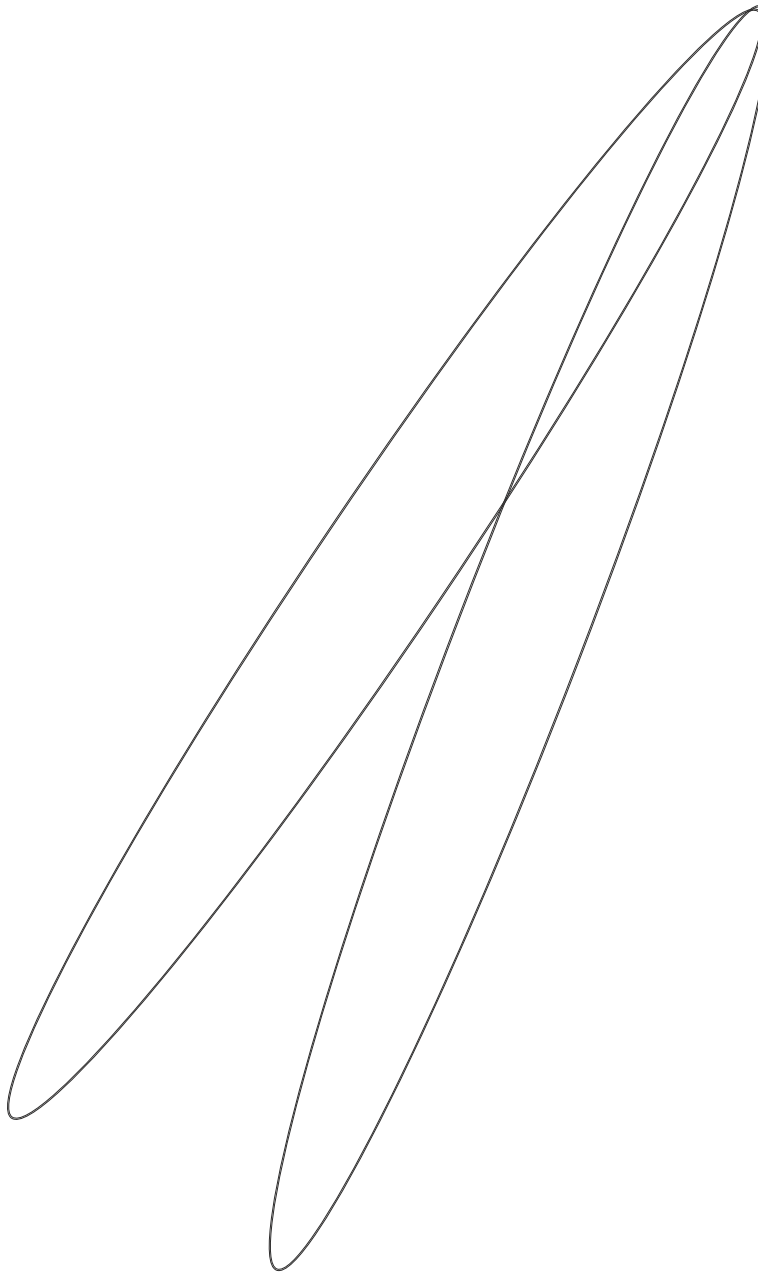
Drawing is dynamical as a process.

It is a form of making that allows for reconstitution, till things settle, just to be.

Still, active and generative.

A trail of ants climbing a molehill.

The dynamism in the opposition of the real with the imagined, the possible in the impossibly complex, remain a preoccupation.



In the words of Yves Bonnefoy,

“In speech poetry; and beneath the pencil, the drawing.”

Yves Bonnefoy, “Overture: The Narrow Path toward the Whole”, *YFS 84, Boundaries*: *Writing* & *Drawing*, ed. M. Reid, Yale University, 1994, p.14.

To see with a pencil

Cell biology, I knew had to be different.
I started to question, if biology could be physics, could physics become biology?
Was it really possible to make life from scratch?

With a pencil it is possible to draw monsters, and non-monsters alike.
Anything really, with a pencil, things have been made for a long time.
Without the thumb and the forefinger, many things become impossible.

But everybody knows this.

Quoting seventeenth-century German religious poet Angelus Silesius, "The soul has two eyes: one looking into time, the other one looking way ahead into eternity", Vilem Flusser writes that it is only since the third millennium that to represent the "possibility of looking through time into eternity" has become relevant.
As Flusser elaborates.
In Mesopotamia people stood on top of hills to study the flow of Euphrates.
They recorded this observation on clay tablets.
"At the time, these people were thought of as prophets, but we would call them designers instead."
The people of Mesopotamia believed that "this way of seeing involved foreseeing the future."
Greek philosophers proposed another way of seeing the future. For instance Plato believed that this way of seeing, "sees eternity" not "future."
As Flusser explains, the ability to perceive eternal phenomena, Plato's Forms is the ability to theorize. That is, the people of Mesopotamia "were perceiving and noting theoretical forms behind the Euphrates" and were "first to employ geometrical theory."
Therefore, the forms the people of Mesopotamia "discovered-e.g. triangles-are 'true forms'(in Greek, 'truth' and 'discovery' are the same word-i.e. *aletheia*)."
And as Flusser claims, and I concur, the differences in the way the "'second eye of the soul' is judged is critical."

Vilem Flusser, *The Shape of Things* : *A Philosophy of Design*, Reaktion, 1999, pp.39-40.

Lens

A lens is able to enhance the ability to see what we will be able to touch in the future.
If we can say a mirror, it has two faces.
Curved mirrors can pierce through time.

Shape

In order to see with a pencil, everything has to have a shape.
Without a shape, everything is everything.

Without a shape it is impossible to see.

If it is possible to make out a shape, it is possible to recognise and remember.

Reading George Kubler's *The Shape of Time* alongside Vilem Flusser's *The Shape of Things,* stencils become the means to deliberate over the formal arrangement of shapes.
They have scale, they have duration.

To see beyond space and time.

Stencil

There is something curiously disciplinary about using stencils. The shapes are given. It is a simple device. With this device, it is possible to make a variety of shapes.
Embedded within the logic of the stencil are forms that have been and can be repeated ad infinitum. Like the Platonic solids, they can be used to visualise immutable forms.
Contemporary of printing, the stencil can control the thinking hand.
As a repetitive process, it instils standardization.
And brings with it clarity, in every copy to minimize error?

The copying of cells in the body is by division.
Repetition at the cellular scale is through meiosis, as in the making of one out of two, in most human cases. The greater the diversity, the less the chance of error. Multiplication of cells, mitosis, is regeneration. And mitosis out of sync is unwanted proliferation.
To measure growth, visualization becomes essential.
And every cell, like a stencil, is a symbol, a blue-print, and therefore conceptualized as building blocks of life.

As in the construction of architectural plans, drawing is a mode of seeing what new forms are possible out of known geometrical forms. Clumped together as cells, it is possible to work out what something will be, but not become.

Molecules, they are moonlighting.

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Presence of numbers

Wassily Kandinsky says, the objective form/presence in a good drawing or painting is not in the "obvious geometrical configurations", but "hidden ones, emerging unnoticed from the canvas and meant for the soul rather than the eye."

In the unmooring of outward connections,
"*The final abstract expression of every art is number*.
It goes without saying that this objective element is in absolute need of rational factors (object knowledge of the craft) as a necessary cooperating force; and these objective factors will enable the work of today to say forever "I am" instead of "I was.""

Wassily Kandinsky, "Statements and Documents, Artists on Art and Reality, on Their Work, and on Values", *Daedalus*, Vol. 89, No.1, The Visual Arts Today, Winter, 1960, MIT Press, pp.80-81.

Circle

Continuous construction

Ptolemy
Abu Sahl
al-Biruni
Ibn al-Haytham
Nasir al-Din al-Tusi
Omar Khayyam
Kamal al-din al Farisi
Copernicus
Tycho Brahe
Galileo
Kepler

A journey, within a journey, within a journey.
Circles, as can stories be repeated again, and again and again.
Chronologically
Unrestricted.

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Line

> The constitutive element of a body is a surface and the constitutive element of a surface is a line. When a line is joined to another line, then in addition to length, breadth is produced in it and it becomes a surface. When a line is joined to a surface, then in addition to length and breadth, depth is produced in it and it becomes a body. All of these fall under the category of quantity because of the possibility of their measurement. As for the constitutive element of the line, it is a point, for when a point is joined to another point it becomes a line.

Source quoted from Dimitri Gutas, "Geometry and the Rebirth of Philosophy in Arabic with al-Kindi" in *Islamic Medical and Scientific Tradition*, ed. Peter E. Pormann, Routledge, 2011, p. 6. See note 17 p. 15. (Gutas quotes A. DHANANI, *Physical Theory of Kalam*: *Atoms, Space, and Void in Basrian Mu'Tazili Cosmology*, Brill Academic Publications, 1994.)

Alain Badiou on classical maxim par excellence: “The true is sometimes not likely.”

Classical definition of philosophy: “The unlikely truth.”

Perception

Alain Badiou in the essay by the title “Art and Philosophy” writes, “The heart of Platonic polemic about mimesis designates art not so much as imitation of things, but as the imitation of the effects of truth.”
To the question:
“What is the pedagogical function of art?”
Answer:

> Art is pedagogical for the simple reason that it produces truths and because “education” (save in its oppressive or perverted expressions) has never meant anything but this: to arrange forms of knowledge in such a way that some truth may come to pierce a hole in them.

Alain Badiou, *The Handbook of Inaesthetics*, trans. Alberto Toscano, Stanford University Press, 2005, pp.4-9.

Artistic genius

Summed up in the eulogy of artist Ahmed Lahori:

> "Wonder of the Age", who, "used his chisel to remove rust from the face of Imagination."

Source quoted from Gulru Necipoglu, *The Topkapi Scroll : Geometry and Ornament in Islamic Architecture : Topkapi Palace Museum Library MS H. 1956*, The Getty Center for the History of Art and the Humanities, 1995, p. 205.

“Every disease is a musical problem. Every cure, a musical solution.”
Wrote Novalis (d.1802), but then he was romantic poet.

Infinite Spread, 2009

To determine
What it is to be becoming
What it is to think
Drawing is a process
For thinking
As a means to regain a space for the subjective self

Set of drawings, titled **Infinite Spread**
Begin with a focus on infinite space
In continuity,
Infinite consciousness
Upon return
About moments of
Balance
For the individual body
As a credible thing
Signature
A mark
On the space of visual human intelligence

Of the circle of life
Death, a necessary creation.

Bring the hands together
See negative spaces

In a closed form, drink water
And question 'what is it to know anything at all?'
Of orbiting, and circling,
Of the universe,
Inspired by the processes of visualising technologies, such as PET.
The idea of discovery as radioactive agents emit light,
Like a torch in darkness,
Of birth and rebirth
Homoeostasis is unlike stasis.

Portrait of the Inside, 2009

Broken
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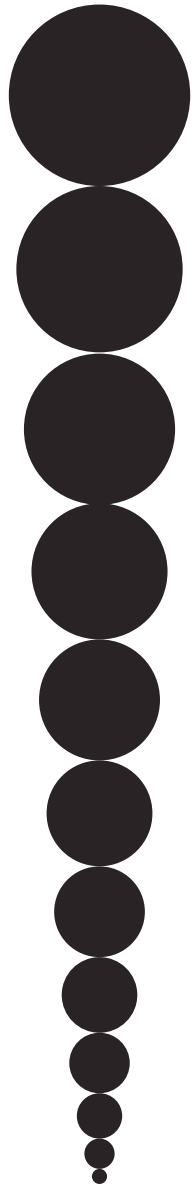
Broken
Cells they are falling apart.
Broken
breaking

Ibn Hindu

Physician, philosopher and poet, Abu al-Faraj Ali ibn-al-Husyan ibn Hindu (d.1019) was an outspoken proponent of the validity of medicine. When a detractor came to ask him for a cure for headache, the following was presented as remedy: the man suffering "should place under his head a certain book which denies innate nature, so that God can cure him."

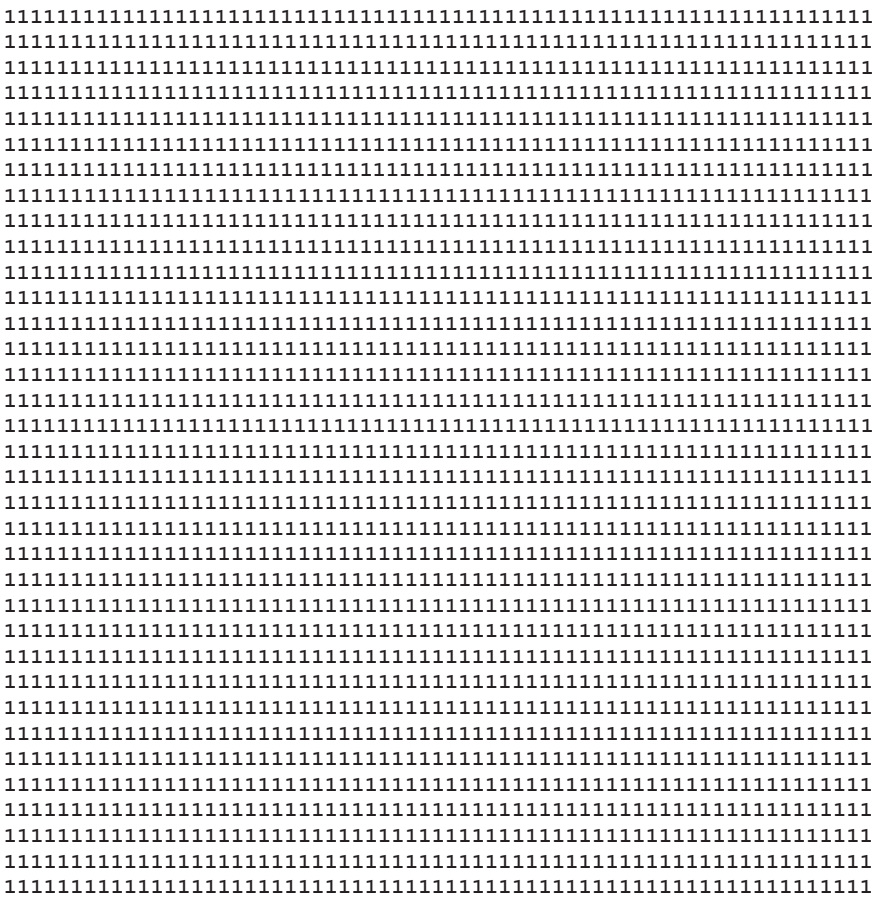
Source quoted from Abu al-Faraj Ali ibn al-Husayn ibn Hindu, *Key to Medicine and a Guide for Student*, trans. Aida Tibi, Garnet Publishing, 2011, p. xv.



Molecular Warfare, 2009

Notebook on counting, Blue, 2009

Visualising numbers
Can all animals count?
Or no animals can really count, we only see more or less?
This blue notebook is a fixation with thinking about numbers.
For example, Graham's number is the largest notational number formulated thus far. What is to be grasped, if each digit were to occupy 1 Planck unit, the Universe is too small to write down this number?
And the mind is big enough to think of it.
For a hundred billion neurons with a hundred trillion connections, it is possible.



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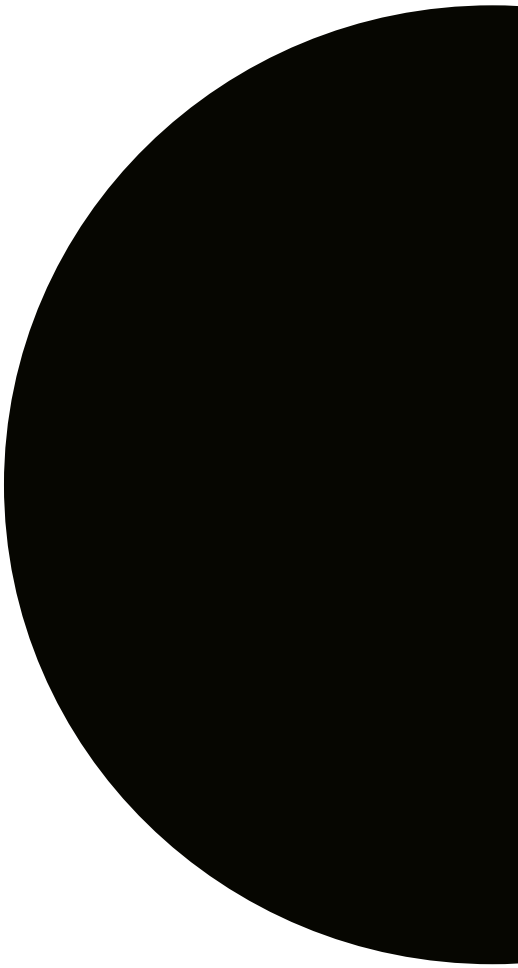
"Horizon Interview", BBC Two, 23, November 1981.
Einstein interview with Alfred Werner, *Liberal Judaism*, April-May 1949.
Lord M. Rees, "Limits of Science", Romanes Lecture, University of Oxford, November 2011.

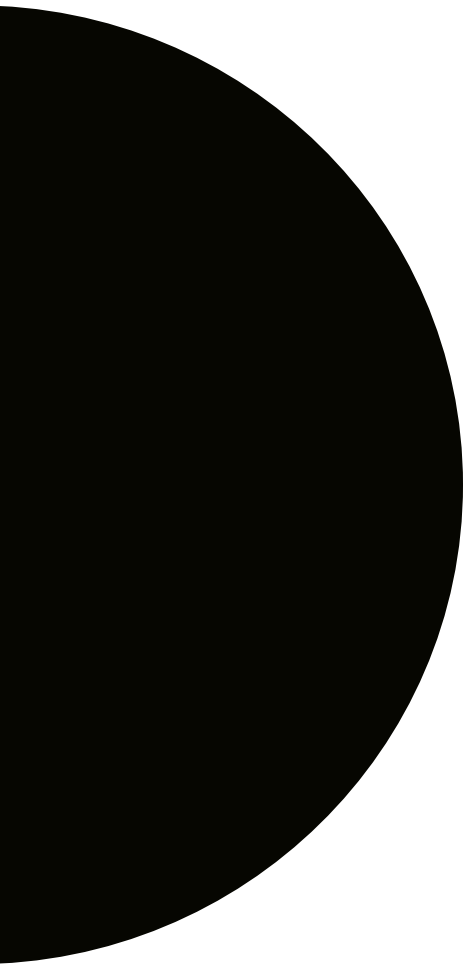
There is Plenty of Room at the Bottom, 2010

The drawings titled, **There is Plenty of Room at the Bottom** get their name from Richard Feynman's classic talk at the annual meeting of the American Physical Society, California Institute of Technology, 29, December 1959. The focus of Feynman's presentation was "to talk about the problem of manipulating and controlling things on a small scale." More than 50 years later, my drawings are homage to some of the ideas presented in 1959. Unquestionably many of Feynman's propositions are a reality today. Including the miniaturization of processors, advances in electron microscopy, biologists using more mathematics and the idea that changes to very small and simple elements scaled up can make a world of difference.

These drawings are also a way to reflect upon the complexity in nature twofold. Drawing as a way to imagine the behaviour of things at a small scale inspired by Feynman diagrams, and to reflect upon the nature of human ingenuity.
Feynman was equally involved in the Manhattan Project.
In a 1981 BBC interview, whilst he acknowledged that he was part of the celebrations at Los Alamos playing drums and getting drunk that were a sharp contrast to what was happening in Hiroshima post the atomic bombing. However, as Feynman says in the interview, what he did immorally was not to remember the reason he was involved. That is, as he says in the interview and I quote, "when Germany was defeated not the single thought came to my mind at all, that meant now I had to reconsider why I am continuing to do this."
"I simply did not think, OK!"
Before that, in a 1949 interview, when Albert Einstein was asked to comment on future wars, he replied, "I do not know how the Third World War will be fought, but I can tell you what they will use in the Fourth-rocks."
Thus being the power of ideology.

The power of ideas is to see similarity in contrast.
To think the unthought.
In thinking about the very small and very large and to think about why the molecular can intuit the cosmic, one answer could be as astronomers tell it.
The history of atoms links the human race to stars as "we are ashes of long-dead stars- 'nuclear waste' from the fusion power that makes stars shine. Each of us contains carbon, oxygen and iron atoms forged from pristine hydrogen in thousands of ancient stars from all over the Milky Way."





"Myth is fixing for inspection, a concept."

Sarah Broadie, *Nature and Divinity in Plato's Timaeus,* Cambridge University Press, 2012, pp. 92-97.

A note on the idea of a Cosmic Soul

To describe how Demiurge fashioned the cosmic soul in Plato's *Timaeus* Sarah Broadie writes,

> Stage 1 he started with indivisible and divisible Being, indivisible and divisible Sameness, and indivisible and divisible Difference, and in each case he mixed the indivisible and divisible kinds together.
> Then
> Stage 2 he mixed together the three mixtures from the previous stage.
> Then
> Stage 3 he marked out all the resulting material into two interlocking series of intervals mathematically determined.
> Then
> Stage 4 he took this entire compound stuff, split it into two along its length, arranged the two strips in a cross, bent each into a circle, and joined the ends and the circles to each other.
> Then
> Stage 5 he gave each circle its motion, which in the case of the inner one, the circle of the Different, he split into seven distinct revolutions.
> Finally, he fashioned the spherical body of the cosmos within this system of psychic movements, and united them centre to centre, the corporal structure with the incorporeal one.

Except, as Broadie explains, Demiurge set aside some materials from the cosmic soul, out which rational souls of mortals were created. And although the body contains all corporeal materials, "reason in man is not a part or manifestation of the great cosmic soul that informs the cosmos" for Plato held the view that "souls were individualised."

Therefore, each rational soul in mortals is not only individualised, but also "invested with individual responsibility for their future actions as mortals, while at the same time shown as completely without responsibility for becoming mortalised in the first place."

Brian Rotman, *Signifying Nothing* : *The Semiotics of Zero*, St Martin's Press, 1987.
Ananda K. Coomaraswamy, *Time and Eternity*, Artibus Asiae, 1947, pp. 2-3.

Notebook on eternity, Red, 2010

The first writing mark must have been more like a vertical stroke, which today we would recognise as 1.
Lots of these strokes make up many numbers.

More than 800 years ago, as the Arab traders introduced the symbol zero to Western Europe from India this time, for historians and mathematicians as Brian Rotman believe the Babylonians of the Hellenistic period and pre-Colombian Mayans had a similar concept. It is amazing that zero added to a single number makes many more numbers and on its own it is nothing.

It is conceivable that without the zero, the writing of numbers might have been less economical.

Ananda K. Coomaraswamy writes at the start of his book *Time and Eternity*,

> From what may be called the fundamentalist or literalist point of view, time in the first sense is thought of as having had a beginning and as proceeding towards an end, and so contrasted with eternity as everlasting duration without beginning or end.

However, as Coomaraswamy explains,

> The metaphysical doctrine simply contrasts time as a continuum with eternity that is not in time and so cannot properly be called *everlasting*, but coincides with the real present or now of which temporal experience is impossible.

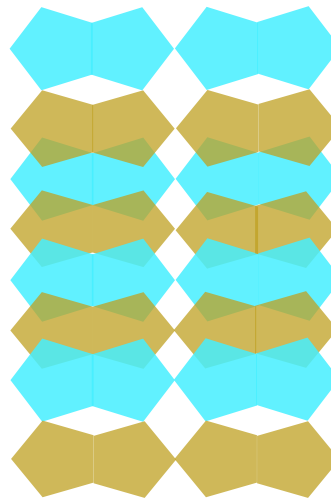
In order to think of eternity or continuous adding up of now as a measure of time in another way, the Coomaraswamy proposition is:
"The confusion can be eliminated if we realise that none of these nows has any duration and that, as measures, all alike are zeros, of which a "sum" is unthinkable."
In this way it is possible to arrive at the categorical difference between now,
and forever.

A note on measurement

Abu Abdallah Muhammad ibn Musa al-Khwarezmi (d.850) wrote manuals on practical arithmetic.
Citing al-Khwarezmi Gulru Necipoglu writes,

> Practical mensuration is only concerned with simplified formulas becomes apparent in the three different pi values al-Khwarezmi provided for calculating the circle, one used in "practical life, though it is not exact,"
> And the other two used by geometers and astronomers.

Source quoted from Gulru Necipoglu, *The Topkapi Scroll: Geometry and Ornament in Islamic Architecture : Topkapi Palace Museum Library MS H. 1956*, The Getty Center for the History of Art and the Humanities, 1995, p. 156.

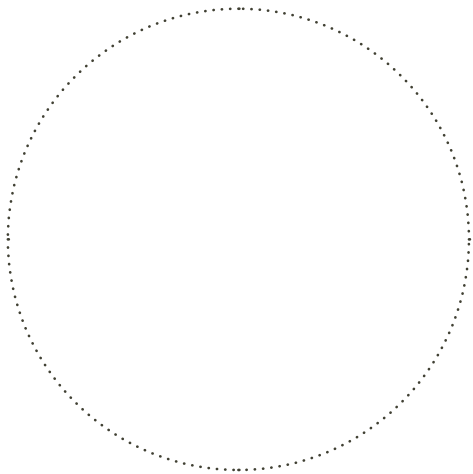


Hans Belting, *Florence & Baghdad*, Harvard University Press, 2011.
Oleg Grabar, *The Mediation of Ornament*, Princeton University Press, 1992, p. 147.
Peter J. Lu, Paul Steinhardt, "Quasi-Crystalline Tilings in Medieval Islamic Architecture", *Science*, 23, February 2007.
Gulru Necipoglu, *The Topkapi Scroll*: *Geometry and Ornament in Islamic Architecture* : *Topkapi Palace Museum Library MS H. 1956*, The Getty Center for the History of Art and the Humanities, 1995.

Science and ornament

1197 The Gunbad-i Kabud tomb in Maragha, Iran was built.
1453 Darb-i Imam Shrine in Isfahan, Iran was built.
1973 Physicist and mathematician Roger Penrose discovers a tiling scheme to cover a surface by using a set of two symmetrical tiles laid out in an asymmetrical, non-repeating manner with five-fold symmetry now also known as Penrose tiling patterns.
1984 Dan Shechtman discovers quasi-crystalline structures in metal alloys where the placement of the atoms show a break with conventional rules of geometry.
1986 Filiz Cagman curates an exhibition of the Topkapi Scroll containing 114 ink drawings with geometric designs that are a hallmark of Islamic architecture.
1989 Oleg Grabar as part of the A. W. Mellon Lectures in the Fine Arts discusses the complexity of the dome of the Great Mosque in Isfahan. In the later publication as *The Mediation of Ornament* he writes in "Chapter III, The Intermediary of Geometry", "The only plausible explanation was suggested to me nearly a generation ago by Eric Schroeder. It is to connect the dome with the work and personality of Omar Khayyam who, at the very time, lived in Isfahan and was developing theories on the irrational numbers (the whole dome is composed on the irrational proportions of the Golden Mean) and on conic sections (the ribs of the dome can be imagined as planes cutting a sphere.) What the connection may have been is still moot and will probably remain hidden, but it is at least possible to relate in time and place and originality in thought and originality in form."
1994 Emil Makovicky finds similarities between Penrose tiling and girih tiling patterns on a tomb in Maragha.
1995 Gulru Necipoglu expands on the exhibition of the Topkapi Scroll in her book *The Topkapi Scroll-Geometry and Ornament in Islamic Architecture*.
2007 Peter J. Lu and Paul Steinhardt state that contrary to conventional view, the patterns in medieval Islamic architecture were conceived by a "conceptual breakthrough in 1200 C.E.... in which girih patterns were reconceived as tessellations of a special set of equilateral polygons ("girih tiles") decorated with lines. These tiles enabled the creation of increasingly complex periodic girih patterns, and by the 15th century, the tessellation approach was combined with self-similar transformations to construct nearly perfect quasi-crystalline Penrose patterns, five centuries before their discovery in the West."
2008 Hans Belting discusses geometry as a symbolic form in Arab culture as pictorial perspective was for the Renaissance artists.

Stencils, return



A Polygraph is also a type of lie detector.

Polygraph Drawings, 2011

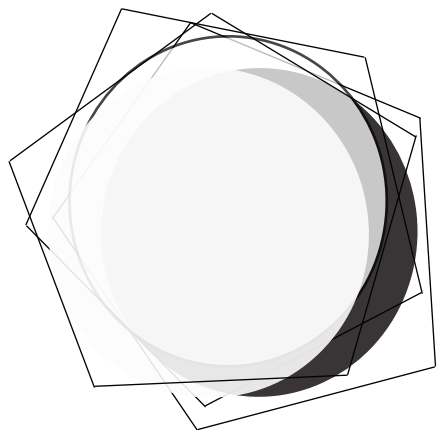
Polygraph Drawings, 21 is a part of the study of drawing instruments at the Museum of History of Science, University of Oxford.

These drawings were produced on site, and inspired by the Museum's rich collection of early drafting and drawing tools dating back to the late sixteenth century Italian silver drawing sets to nineteenth century copper drawing and designing tools.

Motivated by the wish to place myself in the position of the artisans and scientists of the past by actually using the drawing tools, this drawing exercise, although differs from more conventional modes of study of museum artefacts such as measuring and making photographs and other archival methods that include detailed study of provenance. In the handling of the tools, I discovered first hand the ingenuity and precision of the hand-crafted tools that were made by the finest goldsmiths. The process of drawing furthered my understanding of geometry and pattern and the relationship of the eye with the hand in the making of everything we hold to be certain.

In this way, by learning to use the instruments, I was able to connect with the artisans and scientists of the past in the present.

The resulting drawings are like a trace left on paper, joined by touch and the hand.



A note on the difficulty of translation

Averroes' Search

> "The night before, two doubtful words had halted him at the very portals of the Poetics. These words were "tragedy" and "comedy"."

Jorge Luis Borges lived around seven hundred and eighty-eight years after Ibn Rushd, also known as Averroes.
Ibn Rushd did not speak any Greek or Syriac and worked from translations of the writings of Aristotle.
Borges, in the Andrew Hurley English translation, mentions al-Ghazali's *Tahafut al-Falasifah,* which he translates as *Destruction of Philosophers* and Ibn Rushd's response to the text *Tahafut al-Tahafut* as *Destruction of the Destruction*.

Yet, even though *falasifah* is philosophers.
The agreed translation of the word *tahafut* in this context is incoherence.

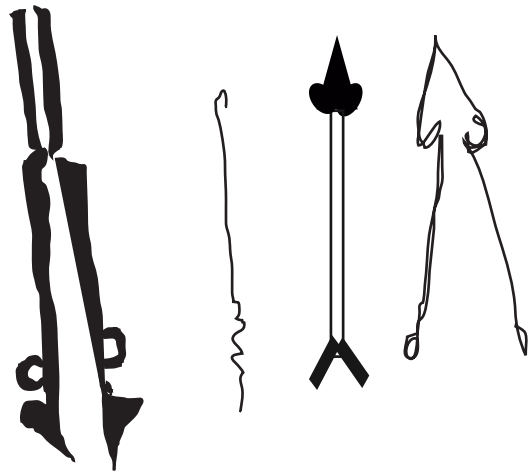
Jorge Luis Borges, *The Aleph (1949)*,"Averroes' Search" (1947), trans. Andrew Hurley, Penguin, 2000, pp. 69-70.

Reference: Abu al-Qasim al-Zahrawi also known by his Latin name Albucasis (d. 1013) invented many surgical tools in use today as noted in manuscripts titled, *Kitab al-Tasrif On Surgery*.
See M. S. Spink and G. L. Lewis, *Albucasis On Surgery and Instruments : A Definitive Edition of the Arabic text with English Translation and Commentary*, The Wellcome Institute of the History of Medicine, 1973.

Full Colour 1, 2 & 3 , 2011

Surgical tools are different.
They are unlike mapping, surveying, and measuring instruments.

This mark making is more like scaring.

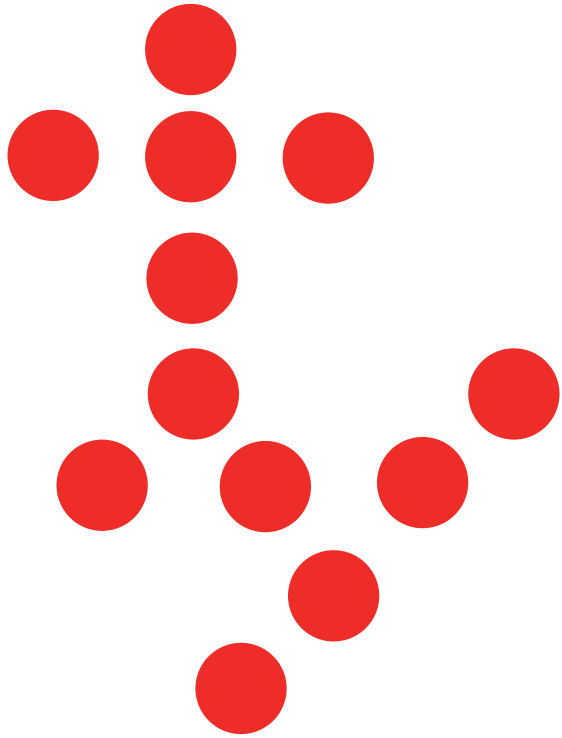


Leaving the pristine aside.
White on white, the drawings **Full Colour 1, 2 & 3** are intended to involve viewer participation as the textured surface draw the optic to haptic.
And in this way touch upon yet an other difficulty for representation.
Pain.

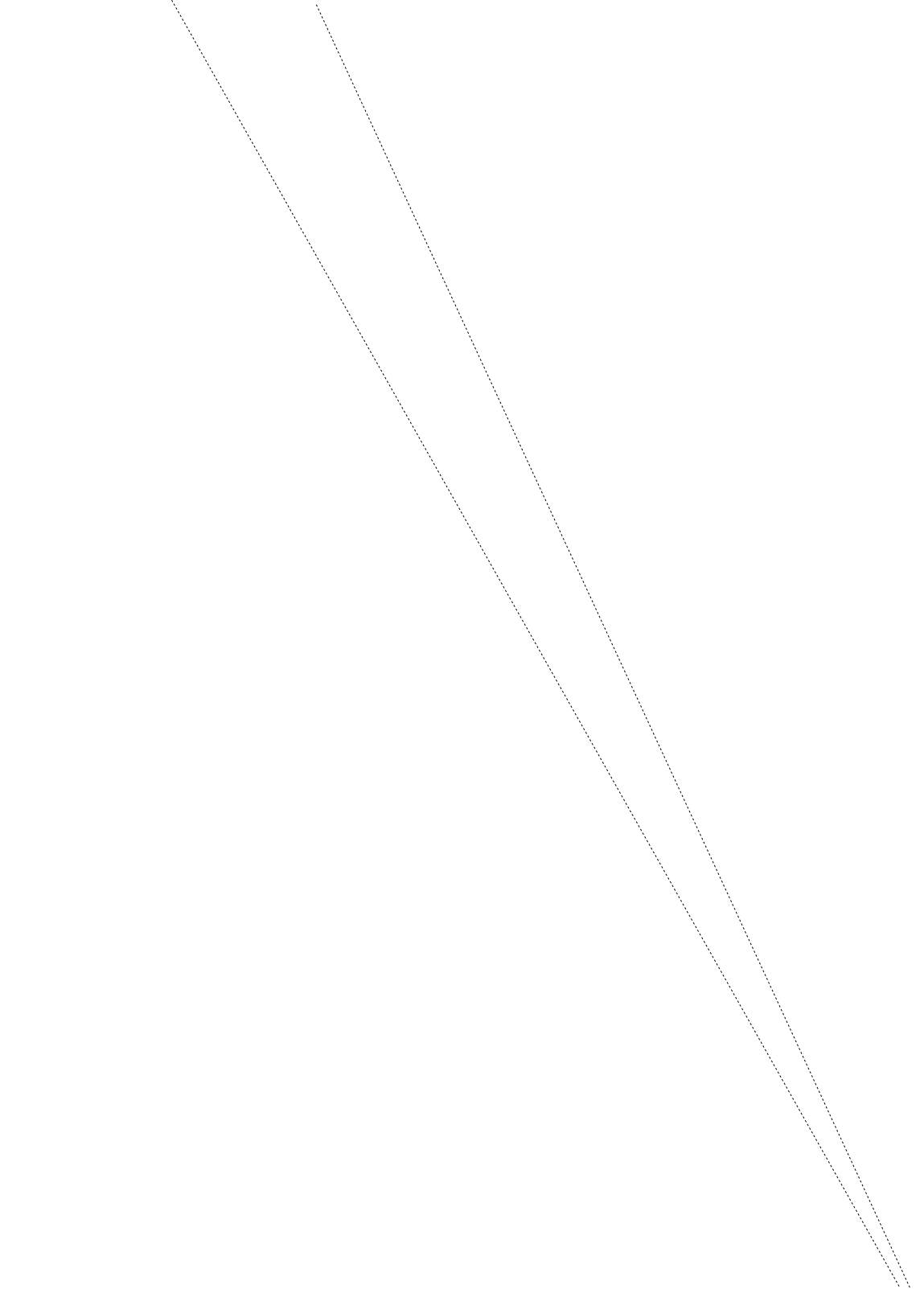
Full Colour, 11, 2011

Full Colour, 11 together with the other drawings in the **Full Colour** series, is a set of discs painted with pigments and varnished to create mirror like surfaces.
The density of the paint is expected to cause momentary blindness to the rest of the drawings in the group.

Juxtaposed with **Senses 33**, **Full Colour, 11** is a way to reflect upon the wonderful character of unaided perception.
The eye can tell apart the metal gold from other metals that might be tinted to produce similar hues.
Faux gold also looks yellow on film.
However, paint and ketchup look like blood.



Flies the Night Sky, 2012



Flies the Night Sky is a play upon ideas of harmony and discord.

Folded as little stealth bombers, **Flies** were first installed in Room 39 at the Ashmolean Museum. Home to a variety of string instruments; viola, cittern, guitar, and violin, the most famous instrument in the display gallery is the Stradivari violin, Messiah.
Preserved from the ravages of war, in a telling correspondence, which passed between Vuillaume (master violin maker d. 1875) and Madame Alard (his daughter) at the time of the Franco-German war, on the 30th of August, 1870, he wrote:

> In my last I spoke to you of Alard's Violin, of my 'Messie,' and of certain valuables which I have here. I do not know what to do with them, for, if one survives, one will be able to recover the valuables when the hubbub is over, as some sous can be buried; but violins cannot be buried.

Every configuration of **Flies** is allied with memories of war.

The 2013 reconfiguration is a way to think about the abilities of remote controlled weapons that can mindlessly wreck havoc.
As a counterpoint to grand narratives of war, **Flies** is about the spectacle of violence in the present time.
In the process of making these paper sculptures, I realised how absurd it is to consider safety when it is coupled with surveillance, given the watchableness of war and violence.

In parting, the folded bits of paper are about silence.
They are as well about ideas of stillness.

They are about a quiet, like the one before a concert. A drone is a drone is a drone.

In anticipation,

Flies allude to kinds of quiet that might be about the unspeakable, or others that are not only palpably muted, but also portend a sense of overall unease and disquiet.

Dol Bel, Full Fake & Rain, 2012

Dol Bel, Full Fake & Rain form digital animation and sound collage multi-screen video installation that explores the links between the apparatus of mapping, counting, military, and medicine.

Ripped from open-source file sharing sites and x-ray crystallographic data-sets of human source protein, this multi-media installation is a juxtaposition of systems that share structural foundations of the most advanced twenty-first century investigative procedures.
The sameness begins with the treatment of matter under the lens, be it human, or other organic or the purely inert. Matter is matter, is what matters.

Uniformity of technique and method of investigation is key to science. As are the mathematical rules of imaging that underpin the work of scientists developing drugs for the treatment of cancer or studying epigenetics or making experiments to test the strength of titanium for instance.
It is incredible that no matter what, structural and material understanding can be best tested in extreme conditions. By subjecting the samples to extreme conditions, scientists can determine structural stability/instability in a particular specimen, and use the very same x-ray beams to 'see' what happens to matter as it disintegrates or say comes apart starting at the atomic scale.
In order to be able to image the atomic structure of a biological specimen, it first has to be crystallized and frozen at 100 kelvin. Similarly, material durability of a metal is tested by subjecting the sample to extreme temperatures at hundred times its weight and mass and then visualising its atomic structure for analysis as it succumbs to pressure.
The groups of scientists working at synchrotron facilities include those working to develop targeted treatments in partnership with pharmaceutical companies with the objective to design smart drugs capable of targeting sites of malignancy by creating localized extreme conditions that would structurally make cancerous tumours come apart at the molecular scale.
Tank and body armour material is also tested in this way.

It is not a coincidence therefore that the locations of the giant x-ray facilities, such as a synchrotron, are located not far from and work directly with organisations such as Science and Technology Facilities Councils and Atomic Energy Research centres.

It is this kind of information that immediately captured my attention. And made me look into the physical connectedness of all matter from the perspective of extreme materialism, that is, all matters are a matter of matter.

Living in a century scarred by the on-going, and seemingly endless premonitions of new wars-disguised in the name of civilisation, science and ultimate ideals of freedom, it begs questioning, what are the choices that must be made when the march of technological progress is at the same time matched with a raise in equally extreme ideology?

Is it the human teleological make-up to auto destruct?

Taking inspiration from Humberto Maturana's concept of autopoiesis, by which he means self-creation, including consciousness upon which rests the ultimate responsibility of the choices that are made; this body of work addresses the perceptual basis of what human is, and can become as advances in technology offer ever new possibilities.
Taking Maturana's conceptual idea "origin looking at itself" from the Origin Symposium, Ars Electronica 2011, projected in sync **Dol Bel, Full Fake & Rain** is an orchestration of communication and exchange of messages between the seer, a signal receiver, and communicator. Written in Morse code, this multi-screen installation is an invitation to the viewer to enter into a space to consider the realisation of the self as a much militarized and technologized citizen-subject.

Written in Morse

Dol Bel and **Rain** are composed in Morse Code.
Named after its inventor Samuel Morse, the artist.
Morse sent out the first telegraph wire between Washington and Baltimore in 1844.
The first official test message was:

"What hath God wrought."

Dol Bel, 2012

Dol Bel
Bel Bel
Bel
Origin looking at itself
Language is an abstraction
Language is a noun
The power of the verb is hidden in the noun
Language made concrete
In doing
Reality
Choice
Emotion Rational
Rational Choice?
Reason as justification
B22
277 K
100 K removed from touch
Symmetry
Geometry
Data
Reflection
Information content
Measurement
Measured reflections
Information content
Automatic
Controlling software
Completeness of Data
Standard Uncertainties
Dimensionless numbers
Time
An imaginary dimension of unknown physical magnitude
Standard derivations

Sophisticated algorithms

C 299 792 458 m/s
Domain of observation

Below 1 A wavelength

H 1 Dalton 1.007 84

C 6 Dalton 12.00 96
N 7 Dalton 14.006 43
O 8 Dalton 15.999 77
S 16 Dalton 32.06
Zn 30 Dalton 65.38 (2)

H 1 10%
N 7 3%
38 C 6 18%
O 8 65%
S 16 0.25%
Zn 30 0.0037%

Mn 25 0.05%
K 19 0.25%
Na 11 0.15%
C1 17 0.15%
M 12 0.05%
P 15 1.1%
Ca 20 1.4%
Fe 26 0.006%

Cr 24
Se 34
Mo 42
I 53
Cu 29
Hg 80
F 9
Si 14
Co 27
Ni 28
B 5
Li 3
V 23
As 33
Constant
Mu 0.002 kg/mol

Mole
602,000,000,000,000,000,000,000
Six point zero two, times ten to the power 23

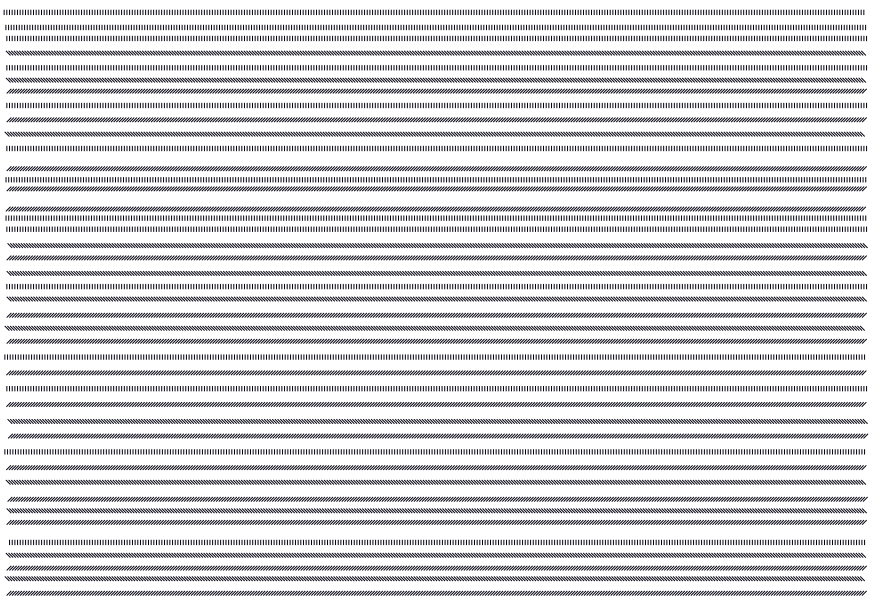
Anticipation Over

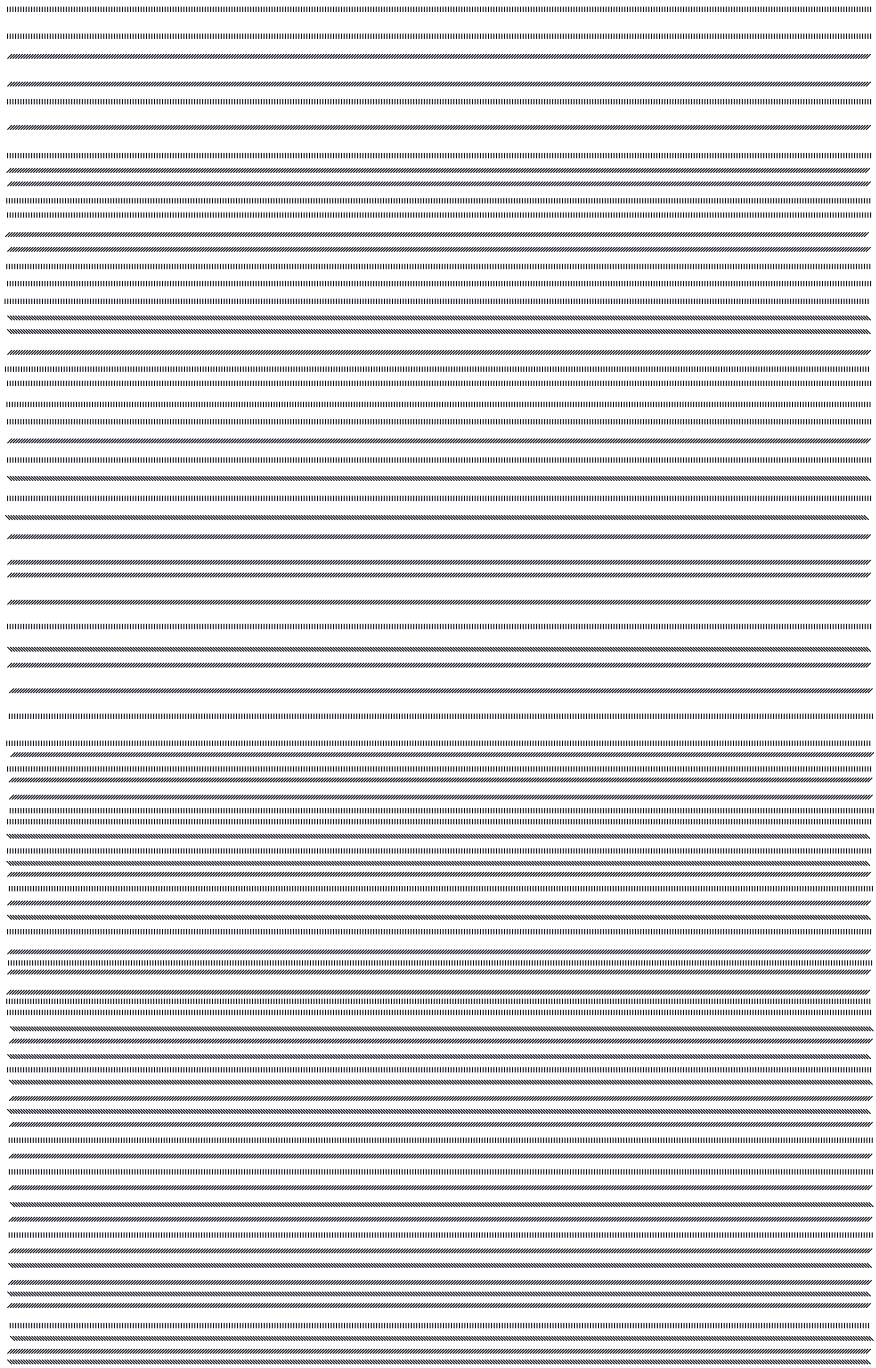
Assembly
Exon Codon AU GC

Morgan Fermi
Probit neutral
Butt
Obsolete
Ell? Elephant?
Fathom
Palm
Dol 10.5
Dol dol bel bel bel
Palm
Dioptre 60

Coherent return to origin

Summary: Homo sapiens identification
Taxonomy Human
SOURCE: Homo sapiens (human)
ORGANISM: Homo sapiens Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Primates; Haplorrhini; Catarrhini; Hominidae; Homo.





See: scarlet picture turquoise orange sun mirror cerulean clay data green graph indigo wax madder blood painting emerald image violet film mercury chalk azurite carmine drawing cadmium orpiment cotton cobalt documentation grey water trace sodium bicarbonate sketch lead titanium calcium index silver moon photo nitrate benzotriazole whiting chalk celluloid ammonium hydroxide borax sulphur purple copper light footage chrome parchment illustration vellum malachite lapis lazuli vermilion slide shellac diagram coal sapphire ink lime zinc nickel fluorescence jade amber illumination egg gold paper ochre lak linseed wood emboss agate gum poppy woad resin magnesium potassium sindoor aluminium print benzene report saffron crimson hematite cochineal map henna gamboge arsenic turmeric ultramarine model x-ray

See and Thirteen Others, 2013

See and Thirteen Others is a set of word based text blocks constructed to comment on the numbness to images that show the extreme conditions of depravity.
The blocks are about the place where both words and pictures fail to convey what the eyes can see.
The word amalgams are a way to expose the differences in what is seen and yet remains unseen, and glossed over without deliberation.

See and Thirteen Others looks at the failure of representation to address issues of violence in particular. Together with **Flies the Night Sky**, this work also references the link of military innovation in weapons technology and the long-term impact on the surviving non-combatant population.
Many of who are certain to face complex health issues.
The most well documented records from the last century are based on the effects of nuclear radiation after the atomic bombing of Hiroshima and Nagasaki.

This event coincided with the Human Genome Project.

The effect of war in the twenty-first century is mostly classified information.
However, effects of unmanned surveillance apparatus and bombing devices can be seen in the raise of pathological behaviour.

The suicide bomber is, but one example.

This century also marks the launch of the Human Brain Project.

Two: high mountain peak climb decline steep rubble totem skin incline oxygen thin stone treeless shot thunder drone buzz ruddy petrified heaven cloud windy timeless frozen white grey war target rough sketch free hideout justice history summit glacier river drop liberty mud clear water lake star snow glare sun season quite quiet lonely religion red poppy heady hawk distance map coordinate feud plane report dope plane dip valley noise remember change satellite robot civilise hide darken inaccessible ordinary plot lock radar beep sapphire time green inflamed ancient estimate faith watch black blue azure pitch fuelled condition home isolated tribal stony nothing futile sick code recruit resilient horny thorny cut-off exposed tough angry humiliated corrupt poor weatherworn location avalanche blanket

Four: TAM VCTP Patagon ASLAV M113 Armoured Personal Carrier Bushmaster IMV Saurer 4k FA SPz Ulan Pandur I Pandur II SK-105 Kurassier BDX Cobra Sibmas FN 4RM-62F AB 2T Stalker EE-3 Jararaca EE-9 Cascavel EE-11 Urutu VBTP-MR Guarani VBTP Charrua EE-T4 Ogum FNM Cutia EE-T1 Osorio Ramses II M1A1 Abrams Fahd 280-30 Tiger Kader-120 Bison APC Cougar Grizzly Husky Coyote Stryker Pirana Sisi Nasu Leopard Mowag Piranha Marder Puma Biber Wiesel Skorpion ATF Dingo Arjun MBT Bhim SPA Tosan Zulfiqar Lion of Babylon Pirahana Caterpillar Wolf Golan Merkava Rascal Centauro Leopard Bushmater Fennek Mohafiz Al-Zarrar Matador Maverick Rooikat Eland Hippo Mamba Saladin Ferret Stingray Crocodile Gazelle LOV-1 ATF Dingo Nag Marder Luchs Sabra Boxer M-1978 170 mm SP Black Eagle Tank Vijayanta Grizzly Yak K1 ARV PT-76

Seven: treason betray pummel punch kick cut lacerate belt tie choke split break shoot blow knife blade hurt confine muddy disbelief shatter inject electrocute overdoze tease defame malign vilify disfigure lock bite acid blind iron slander scar damage incarcerate mutilate wound burn mark gag fold water-board poison contaminate drown radiate nuke bomb gas starve mar dismember deprive brainwash lie destroy self cowboy punish hunger depress soldier greed double-cross mercenary excommunicate stifle abandon wreck exile hunt bounty ransom spy agent loot bulldoze tank bandit maul deal trap disrespect castrate military detain censor suffocate cell brutal fine haunt drug torture police penalize tax terrorize humiliate jail hang electrocute click drag break knees break fingers break nail strike off head

Salt, 2013

Hayy ibn Yaqzan Alive son of Awake was written by philosopher and Almohad court physician Ibn Tufayl (d.1185). Translated from Arabic into English for the first time in 1674 by Edward Pococke, this novel tells the story of the life of a young boy Hayy who finds himself on an equatorial island imagined to be in the Arabian Sea.
Raised by gazelles, this young boy's life quickly changed at the age of seven upon the death of the doe Hayy took to be his mother.
Left with the corpse of the doe, Hayy spent days searching for the deceased. When his search came to no avail, Hayy became convinced that the doe, his mother, was to be found lost somewhere inside the body. In contemplating this thought, Hayy set to dissect the corpse. Except,
Once he had opened up the body, amazed by the discovery of its interior anatomy, from this moment on, he forgot his grief and began to teach himself about all that surrounded him on the island. In doing just so *Hayy ibn Yaqzan* is the story of philosophical awakening.
In Latin therefore this novel is also known by the title *Philosophus Autodidactus*.

Salt is inspired by the story of Hayy, especially as the name Hayy translated into English is alive that etymologically is the root of the words existence, sense, honour, and living, which is the time from a person's birth to death.

Senses 33, 2013

The upper most bound of distinct senses in humans is 33.
These include;
Sound
Touch
Sight
Smell
Hunger
Being full
Sense of time or chronoception
Nocieption (pain)
Proprioception
Itch
Vestibular Sense
Magnetoreception
Chemoreceptor Trigger Zone
Light-headedness
Thermoception
Synaesthesia
Tactility
Premonition
Taste
Order
And even aesthetic.

Leon Battista Alberti, *On Painting*, trans. Cecil Grayson, Penguin, 1972, p.85.
Boris Groys, "Art in the Age of Biopolitics: From Artwork to Art Documentation", *Documenta 11*, Hatje Cantz, 2002, pp. 108-114.

Moon Gold

> There are some who make excessive use of gold, because they think it lends a certain majesty to painting. I would not praise them at all.
> …Besides the fact that there is greater admiration and praise for the artist in the use of colours, it is also true that, when done in gold on flat panel, many surfaces that should have been presented as light and gleaming, appear dark to the viewer, while others should be darker, probably look brighter.

Boris Groys writes, "One feature of modern technology is that we are no longer able by visual means alone to make a firm distinction between the natural or organic and the artificial or technologically produced."
That is, the distinction between artificial and natural based upon visual assessment is blurring.
And this continues to concern.

At the same time, perfection is in the comprehension of the impossibility of perfect representation.
In this way we get to the categorical difference between seeing and knowing.

Looking to Draw

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