

A Prospect of the Sublime in Data Visualizations

(Slides and notes from presentation in Boulder 2005)

Lisa Jevbratt 2004/2005

Looking out and up



The Polar Sea, Caspar David Friedrich 1823-1824

In Caspar David Friedrich's "The Polar Sea" we look out on an endless inhospitable ocean of snow, ice, and a shipwreck - a trace of an attempt to do the impossible, to go "there", to reach for and understand the unbearable void in the distance.



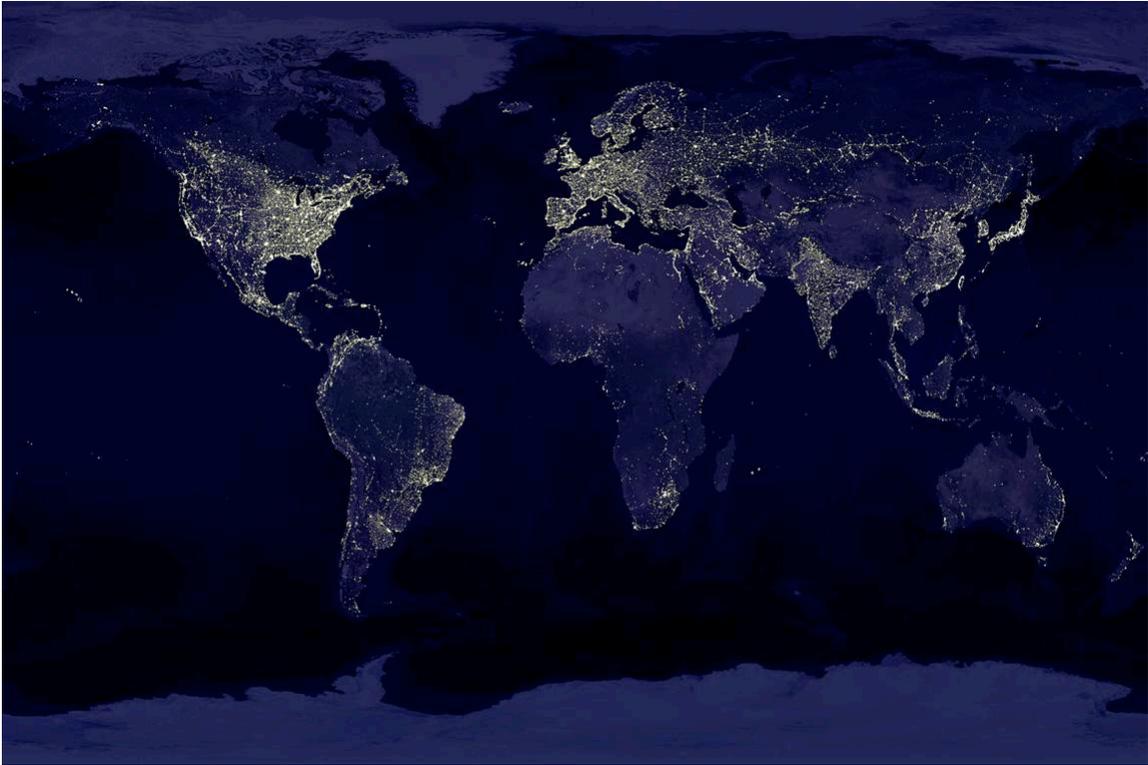
Starry Sky¹

We look up at the starry sky and we sense a fear of not comprehending and being engulfed, a fear of the unknown, and simultaneously we experience a longing for that inaccessible, impenetrable darkness.

These are the classical visuals of the sublime. Images of a sense of grandeur we can't reach, which we can't penetrate or grasp. It is in the very far distant, it is hidden in layers of mist, or made inaccessible by a climate not suited for us, and it instills a sensation of deep fear. Yet we urge for it, we are fascinated and attracted by it.

Looking down and in

It is 2005 and we look down.



We consume satellite and aerial photography in all its forms: we have the poster of “lights emitted from the earth” on our walls (maybe pondering what those lights says to by-passers – gods, aliens and others),



Banda Aceh Shore, Indonesia, before the tsunami December 2004

on the web we can access detailed satellite and aerial photographs looking down on our houses or whatever we want to surveil from above. In the tsunami victim fundraiser on TV a couple of weeks ago, each section of the show was introduced with an before



Banda Aceh Shore, Indonesia, after the tsunami December 2004

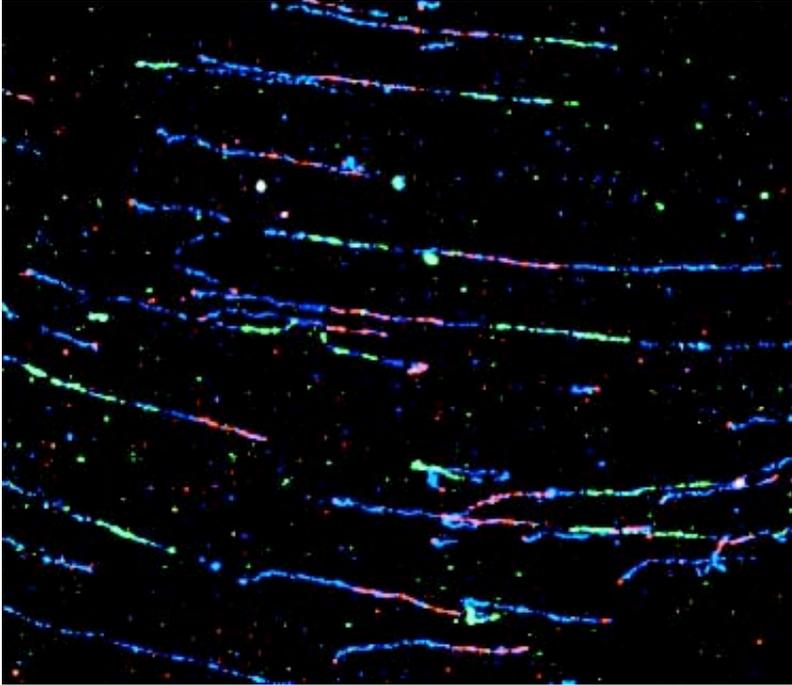
and after image of land severely savaged by the waves.



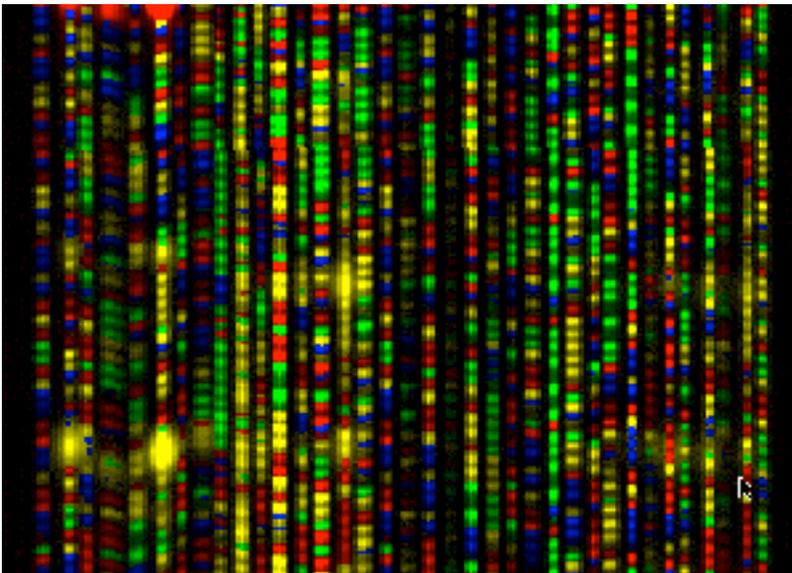
The Rocky Mountains, Colorado. Picture sixty-three taken with my new camera. 2004. Jevbratt.

And we are capturing mountains far below with our first digital camera.

We look down and we look in.

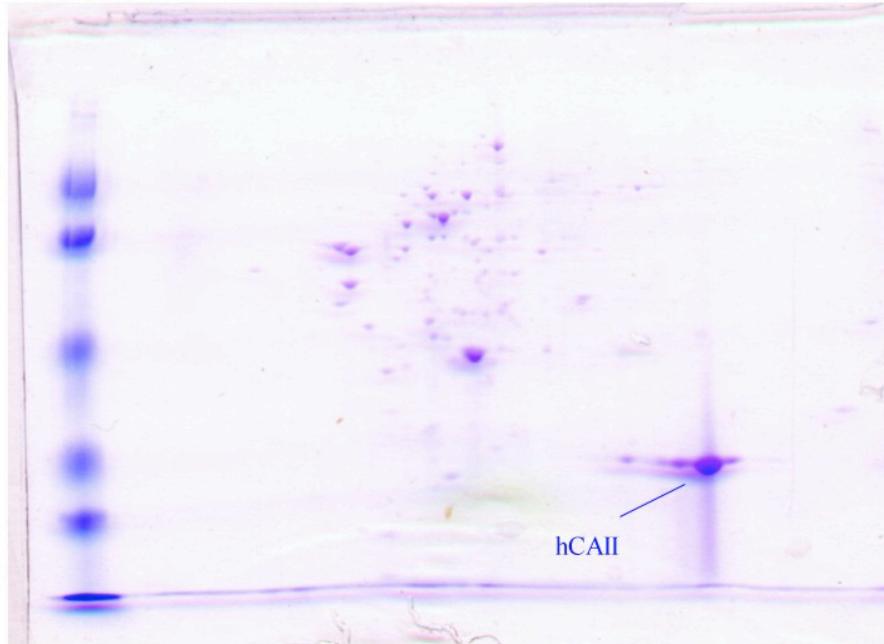


Peripheral evidence: Gel



Peripheral evidence: Micro Array

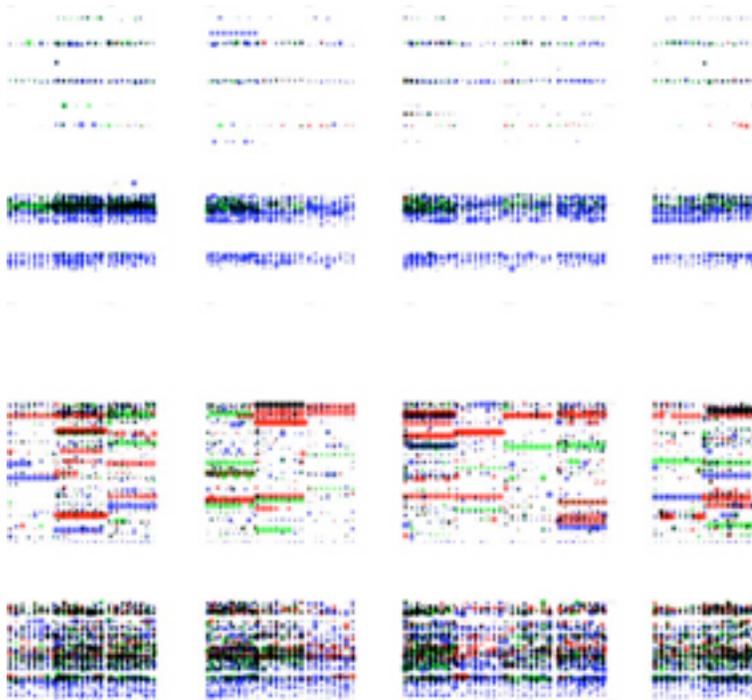
The genome is mapped and we are trying to figure out how it looks and how to look at it. New technologies for looking in, towards, and inside, cells, RNA and nano structures are rapidly developing,



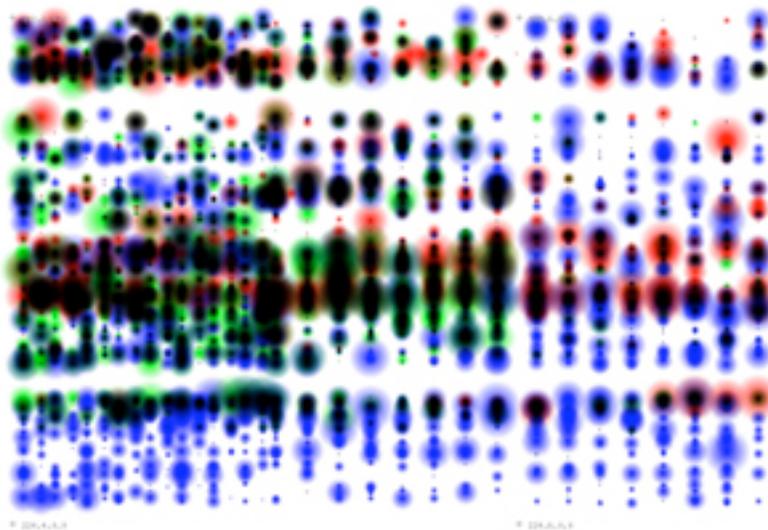
Peripheral evidence: two dimensional polyacrylamide gel.

and the methods of making peripheral evidence of them and their processes are constantly refined.

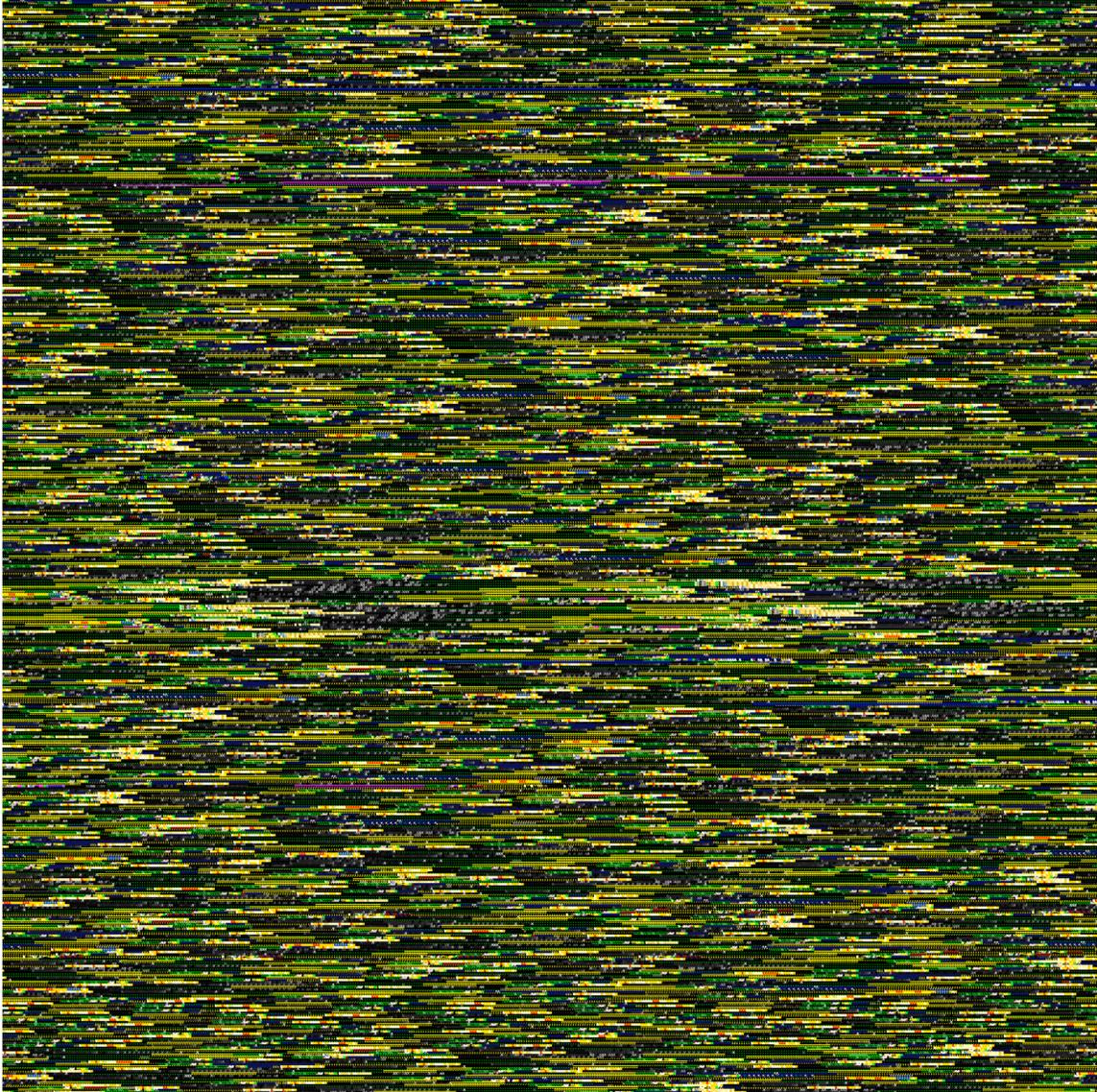
We look at data from the networks we are creating, data about the environments these networks constitute and about ourselves, our browsing, communication and consumer activities.



Migration. An update of the *1:1(2) Migration* interface made in 2005. Each pixel location on the picture represents 255 IP addresses. The pixel in the top left corner represents the 255 addresses that start on 0.0.0 and the one in the lower right corner the ones that start on 255.255.255. Each blob represents a number of IP addresses that have a Web site. The red blobs represent the Web sites found in 1999 and the green represent the Web sites found in 2001/2002 and the blue blobs the sites found in 2005. The size of a blob is determined by how many sites it represents. Since each pixel/blob location represents 255 addresses, each blob represents between 1 and 255 addresses. The amount of sites is mapped to the blob on a logarithmic scale. The black-brown color is an indication of clusters of sites that existed both in 1999 and in 2001/2002. (Jevbratt, 2005) (<http://jevbratt.com>)



Migration, detail, 2005.



Visualization from Infome Imager Lite. Jevbratt 2005 (www.infome.net)

The datasets we are looking at now, data generated from looking in and down at us, the earth and our technologies, are of no less dimension, vastness and grandeur than the “datasets” that were the subject of the classical sublime: impressions of the nature out there, the universe up there; and the sensations of the sublime generated and described by the romantic artist, philosophers and writers are of great interest to us when trying to make sense of our datasets today whether it is through computation, analysis or, as in my case, visualization.

Attraction/Repulsion

However, while the datasets of today are as substantial, complex and ungraspable as the ones dealt with in the original romantic sublime, there is a difference in direction, and also in the forces activated and the methods in which to engage the sublime.

In the original sublime the force operating in us is attraction. The object of desire is over there, far away and we want to reach it. We want to go there, we are scared and intimidated but our longing and effort is 'towards'.

When our force (engine, energy, luck) fails the ship stops, it does not get closer. The forces of nature push us away - we urge to approach.

One could say that the original sublime was the extreme tension, and the pain that tension causes, of not knowing and wanting to know.

Now, looking in and down the force operating in us is reversed, its repulsion.

If the engine in a plane stops, it approaches the ground; the natural force is gravity and we need to stay up and away. We are pulled down and respond by retracting. The forces of nature pull us down and in, and we urge to repel.

The sublime now is the extreme tension, and the pain that tension causes, between (hypothetical) familiarity - the earth is our home, the cells and DNA are in our bodies, the networks are our creation - and a methodological distancing.

Let me explain this a little further using this slide.

True) <- (We = (False -> We)

The original sublime operated in an epistemological and ontological condition in which there was a separation between us and whatever it is was we wanted to know something about, just as it was a split between culture and nature. And, we were certain there was something to know out there, outside ourselves and to be able to gain knowledge about it we needed to approach it. Today, we have a somewhat inverted epistemological and ontological condition and thus the sublime that operates within it is an inverted sublime. We know now, learning from fields as varied as post-structuralism and quantum physics, that we are always part of the system we are looking at. The way we look at something changes the thing we are looking at. We also know that, by looking at something we will potentially know less about it. I recently heard an astronomer mention in a talk that we know approximately what 3 percent of the universe is, what it consist of. Just a few years ago that number was 5 percent. The logical response to this inverted epistemological/ontological condition is that we now need to retract. Not approach.

In the original sublime we wanted to go "there" because we wanted to know.

In the inverted sublime we don't want to go there because we don't want to not know.

So why are we trying to find methods that are allowing the sublime to operate today?
And what could those methods be?

Esthetic decision-making

In the article “Systems Esthetics”² from 1968, its author, Jack Burnham, wrote about the new complex process or systems oriented society, culture and economics he saw emerging: a new era in which a new form of systems analysis would be the most relevant method for making understandings in any discourse. Burnham argues that because we can’t grasp all the details of our highly complex systems (economical, cultural, technical, etc), we cannot make “rational” decisions within them or understand them by analyzing the parts or even the system. The way to make decisions within them and to understand them is by making more intuitive, “esthetic decisions”, a concept he borrows from the economist J. K. Galbraith.

This idea has an intriguing parallel in the philosopher Emmanuel Kant’s reasoning about the mobilizing effect the sublime has on our organizing abilities. Kant claims that in experiencing the sublime, by facing large amounts of information, huge distances and ungraspable quantities, our senses and our organizing abilities are mobilized. Contrary to what might be believed, we feel empowered, able to make decisions, and capable to act. This is of great interest to the field of data visualization. Many strategies for aiding people in the task of turning any large set of data into knowledge assumes that they should be presented less information and fewer options in order to be able to make sense out of the data.

However, humans are capable of sorting through enormous amounts of visual information and make sensible and complex decisions in a split second, (the ability of driving a car is one example). Supported by Kant’s idea I propose that under the right circumstances, drawing on sensations of the sublime, people can, when faced with huge quantities of data, be mobilized to make intuitive understandings of the data. Many information visualizations, artistic or scientific, are a result of the mistake of compressing the information too much and decreasing the amount of information through calculations that embody assumptions that are never explained. The most common mistake in data visualizations is not too much information but too little, their “images” of the data landscape are not high resolution enough for an esthetic decision to be made.

Meaning is opportunistic

Why is low-resolution highly compressed data representation less meaningful? If it is counteractive to a sublime, why is that? How does that sense of awe and 'aha' that the fear and force of the sublime helps us experience transpire?

Meaning behaves like a parasite. It is *opportunistic*, taking “immediate advantage, often unethically, of any circumstance of possible benefit”, and if meaning is opportunistic, and

opportunism implies an unethical stance then it could follow that meaning does not thrive in an ethical environment. This reasoning is more interesting if one understands the term “ethic” as an opposition to “faith”. Ethic is a stance in which one in any moment is aware of ones goals and choices. One has a plan and a way in which to carry it out. Faith is a stance in which we let go, were we are submerged and surrendered, when we are trustingly accepting a “truth”, an emotion or a calling.

Following this thinking, culture is extremely meaningless because so many choices have been made, and nature is extremely meaningful since no choices have been made. It seems like we strive to cut the extremes, the very meaningful and the extremely meaningless. To make culture more meaningful we create unstable conditions for decision-making: i.e. to reduce the number of ready-made choices, we create unpredictable and arbitrary events and expressions within it. As a parenthesis it is interesting to see that younger people are more prone to produce these. Quite likely a young mind has more difficulty dealing with the burden of meaninglessness, and thus tries to minimize it by generating arbitrary signs (such as the expressions, fashion and sounds of various subcultures). To make nature less meaningful we organize and categorize it, and our experiences of it. (Of course nature is only void of choices if one does not believe in a creating god. In fact the very idea of a creationist god could be seen as another attempt to decrease the meaningfulness of nature). However, another, contradictory reaction to nature might be that our ability to perceive meaning is numbed by the loudness of it. Just as our retina gets saturated after looking at one color and creates a ghost image of the opposite color when we look away briefly, nature can (falsely) appear as if completely void of meaning.

What this reasoning implies, is that as soon as we are trying to make what we experience ethical, i.e. succumb to a plan and direction, by making deliberate choices, the experience and its data decreases in meaning. If we semantically categorize and search for meaning, it is as if we try to look at the dust on our corneas, we can't see it unless we stop looking at it. Everything becomes meaningless when we attempt to “capture” the meaning. In the task of visualizing huge datasets this means that we need to avoid making assumptions about the meaning of the data in order to allow meaning to find an opportunity to occur.

Identity in the non-intended

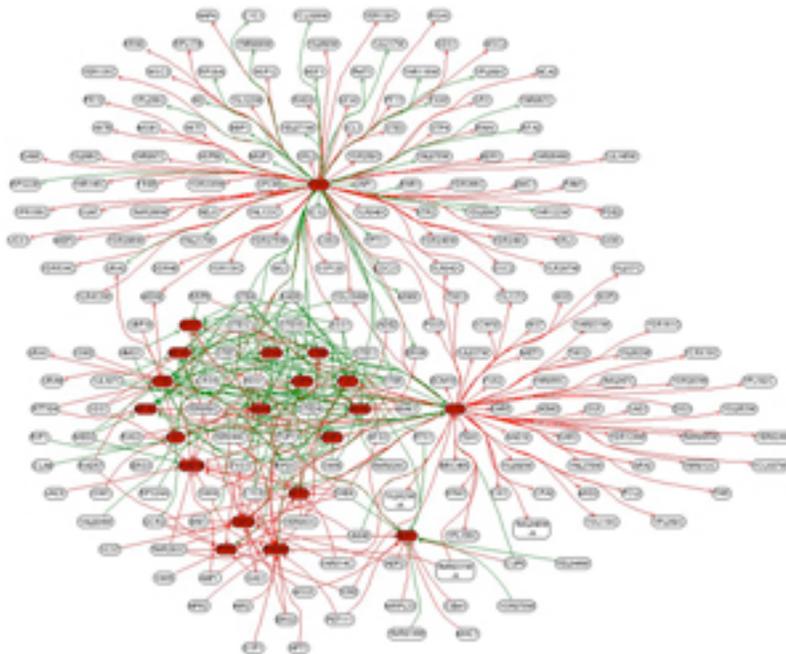
I want to mention three interesting examples of how identity can be found not in the deliberate attempts but through the seemingly less intentional parts of a system.

Some years ago a student of mine made an interesting discovery in a project he made³. It was Web software that returned the result of a search for something on three different search-engines in the reversed order. I.e. the most relevant (however the search-engines define that) was last on the list and the least relevant of the relevant sites was shown first on the list. The result was striking. The least relevant sites, the ones usually so many clicks away we don't bother to look at them, varied greatly between the different search engines. The most relevant results, the ones usually displayed on top, were all the same.



Morelli

A related finding was made some centuries earlier by Giovanni Morelli (1816-1891). He sought to find a method of determining authorship of paintings and came upon the fact that authorship is more detectable in the parts of a painting done with less intention; the parts which are not significant for the author or the genre in which the painting is made, such as earlobes and fingernails. His method is now called “The Morelli Method”. In art historian Edgar Wind’s words it is interesting that “Personality is found where personal effort is the weakest”.⁴



Gene Network

Another strikingly similar finding in biology, was made by Albert-Laszlo Barabasi who in his book *Linked: The New Science of Networks*⁵ explains his research on network structures and linkage systems of various fields from computer networks to biology. He finds that “For the vast majority of organisms the ten most-connected molecules are the same.” (p. 186) These highly connected molecules, hubs in Barabasi’s terminology, are equivalent to the most relevant pages in a web search or the traditionally most “important” features in a painting. These are the items, nodes, with the most intent. And just as the least relevant web pages are the most dissimilar, and the least important features such as earlobes say more about the painter, the difference between different organisms and the production of their identity lies in the least connected, least used or significant molecules. He concludes: “[T]hough the hubs are identical, when it comes to the less connected molecules, all organisms have their own distinct varieties.” (p. 187)

Via Negativa

These are all evidences that reality does not show itself to us in an expected manner, through intention and expression, but it reveals itself to us indirectly in small fragmentary pieces. The method of searching out those bits and pieces without preconceived notions on what to find has been an important method in various mystic traditions, and the term *Via Negativa*, possibly coined by Dionysius the Areopagite, a late 5th century mystic, is used to describe it. Via Negativa is a method of distancing, of negation, in which we claim or pretend to not have any preconceived notions of the systems that we are looking at. The method has a lot of similarity with artist methodologies (such as Joseph Beuys) and now also with some contemporary scientific methods.⁶

Summing Up

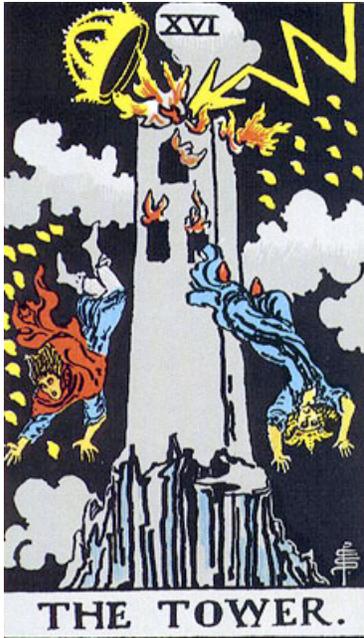
Dimension:	Original Sublime:	Inverted Sublime:
Looking	Up, Out	Down, In
Our Traveling Direction	Towards	Away
Force acting In us	Attraction	Repulsion
Force acting On us	Push	Pull
Law of Nature	Friction	Gravity
Part to Whole Relationship	Separation	Symbiosis
Belief System	Ethics	Faith (leap)
Nature of Meaning	Deliberate, Created	Opportunistic, Non-intended
Spiritual Method	Via Positiva ⁷	Via Negativa ⁸
Hyperlogic/Protest	Stopping	Falling

Falling

If staying up and away is our (or others, things or beings) effort in the inverted sublime, then the fall, the ultimate inability to do so, is a trope of interest. There are many significant falls ranging from literary, such as the fall of



Alice, the girl in Wonderland, to



metaphorical, such as the violent tower card in the tarot deck



, and physical and political, such as the fall of the Twin Towers.



Juno falling and snacking. Still from *Spy Kids 2: The Island of Lost Dreams*

I choose to end with this image because it turns my reasoning upside down or should I say inside out. I liked the coincidence that that Richard ended his talk with the “walking and falling” image.

In "Spy Kids 2: The Island of Lost Dreams", Carmen and Juno, the spy kids, fall into a model of the landscape that they are walking in, through the mouth of a volcano. Their fall lasts for an extended time, not unlike Alice's fall, so long that they take comfortable positions, eat a snack and discuss the possible outcomes of their fall. However, in the end, they might not have been falling a very long distance. The model that they are falling into has an air vent blowing air up sufficiently strong for them to be lifted and they might have spent most of the time in the illusion of falling, actually being pushed away, experiencing the natural force of the original sublime, not pulled down, as they believed.

¹ Walter Koprolin, copyright © 2004 by Walter Koprolin
http://www.astro.univie.ac.at/~exgalak/koprolin/Photo/StarF/Cass_Per_50mm.html

² Burnham Jack Artforum, September 1968

³ Gielow Ryan, San Jose State University, 1999

⁴ Ginzburg Carlo, “Morelli, Freud and Sherlock Holmes: Clues and Scientific Method” in History Workshop Journal, 1980

⁵ Barabasi Albert-Laszlo, “Linked: The New Science of Networks”, Perseus Publishing, Cambridge Mass., 2002

⁶ Gamwell, Lynn, Exploring the Invisible: Art, Science and the Spiritual, Princeton University Press, 2002

⁷ Mystical union through identification with the whole.

⁸ Mystical union through dis-identification with the whole.