

The Impure And Unpredictable Lines Of Flight

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Abstract

In all processes: scientific, creative or social; change and insight emerges from dissidence, flaws or mistakes. These anomalies are generated in the virtual, the present where past and future eternally meet offering the potential for creative lines of flight.

The technologies that emerged in the second industrial revolution underpinned the machine aesthetics of the historic avant-garde movements of early 20th century. Any illusion that this phase of technological and artistic advance would automatically lead to mass emancipation was crushed by Stalinism and the destructive force of the Nazi war machine.

Mass culture and production attracted authoritarian notions of order and conformity that chimed with intellectual frameworks obsessed with fixed and timeless structures, typological thinking, purity and certainty. As Primo Levi eloquently argued change emerges from the impure and unpredictable, a notion that is anathema to all repressive, authoritarian, regimes. While Manuel DeLanda contrasts the rigid Euclidian mechanics of assembly line production with the adaptive, organic, biological processes of tissue generation.

In the aftermath of WW2 like a phoenix rising from the ashes, dynamic generative code placed an emphasis on process over structure with the potential to re-define disciplines and social fields. Alan Turing's universal machine, anticipating the infinitely adaptable, programmable computer, emerged from the convergence of mathematical problem solving, wartime code breaking, and speculations on the human mind. Watson and Crick's double helix as the configuration for the production of life was derived from photographic interpretation and tinkering with Heath Robinson-like models.

Paradigm shifts in mathematics and molecular biology were matched by the insights of artists coming to terms with the de-locating force of machine warfare and mass production driven consumerism. Avant-garde filmmakers and writers challenged the fixed codes of mainstream narrative literature and action cinema. Andy Warhol's silkscreens and films messed with the repetitive codes of mechanical reproduction and Gerhard Richter manipulated the 'virtual smudge' of the photographic event.

1 Primo Levi – In Praise of Impurity

Primo Levi's *Periodic Table* brings together his passion for chemistry and his personal tales of defiance in the face of Fascism and anti-Semitism. The Periodic Table originally charted the basic elements from which the known world was composed. The paradigm shift in atomic physics at the turn of the 19th century introduced a new level of mutability and dynamism into the table, extending its members through fission, fusion and radioactive decay. Levi's own Jewish community in the Piedmont region of Italy were a product of migration and only partial integration into Italian society over five centuries reflected in their distinctive argot, a hybrid of Hebrew and Piedmontese. He designates his community to the relatively immutable element of Argon, 'a so called inert gas'. Although not materially inert having to strive to earn a living he describes his Piedmont community as spiritually inert:

their deeds...having in common a touch of the static, an attitude of dignified abstention, or voluntary (or accepted) relegation to the margins of the great river of life. [1]

The relative stability of this community was to be shattered by the rise of Fascism. Firstly, by the introduction of anti-Semitic laws by Mussolini's government in 1938 and then more profoundly by the German invasion of northern Italy in 1943. Before joining the partisans and his eventual capture and deportation to Auschwitz, he completed his chemistry degree in Turin. The University laboratory is the site of his encounter with elemental zinc providing an allegory of purity and impurity intertwining questions of race and chemical reactions. His failure to get pure zinc to react with sulphuric acid raises two conflicting philosophical conclusions:

the praise of purity, which protects like a coat of mail; the praise of impurity, which gives rise to changes, in other words to life. [2]

He discards the first proposition associating it with the authoritarian and "disgustingly moralistic" propositions of fascism, which promotes uniformity and crushes dissent and diversity. Levi embraces impurity, the grain of mustard that leads to desire and the emergence of the new.

So take the solution of copper sulphate which is in the shelf of reagents, add a drop of it to your sulphuric acid, and you'll see the reaction begin: the zinc wakes up, it is covered with a white fur of hydrogen bubbles, and there we are the enchantment has taken place. [3]

Having left his experiment to cook, Levi wanders off around the lab to see what's new and what his colleagues are doing. He encounters Rita and for that moment realises that the zinc provides a fragile but negotiable bridge between them.

2 Alan Turing – A life Incompleted

Primo Levi's insights flowed from his move to contaminate literature with chemistry. The English mathematician Alan Turing was also driven to transverse disciplinary boundaries. As a schoolboy in an English boarding school Turing encountered a system that could certainly be described as 'disgustingly moralistic' in its intolerance of difference. Turing found a close friend, Christopher Morcom who shared his many intellectual interests, only to be deprived of his companionship by his early death a year before he went up to Cambridge. Turing operated outside of the approved curriculum familiarising himself with the great paradigm shifts in modern science, Darwin's theories of evolution, Einstein's theory of relativity and the emerging quantum theory. Despite his inability to conform to the strictures of his early education he succeeded in gaining a scholarship to study Mathematics at Kings College Cambridge.

At Cambridge in the 1930s Turing gained the reputation of an eccentric loner probably accentuated by his homosexuality. He engaged with the question posed by Hilbert of the provability of mathematics and Gödel's response, whose incompleteness theorem offered proof that mathematics was neither consistent nor complete. Turing's contribution to these arguments was set in motion by a leading Cambridge mathematician, Newman who speculated on the possibility of a mechanical process being applied to mathematical statement designed to come up with an answer to its provability. Turing imagined a machine like a typewriter, that is a machine that could generate symbols that could be adapted to this task. The machine would be automatic, hence able to work without human intervention on a mathematical statement, writing its way towards a conclusion about its provability. This line of enquiry lead Turing towards a computational machine he called the *universal machine*, which could be designed to read description numbers from a tape decode them into tables and execute them. In his search he found an unsolvable mathematical problem contrary to Hilbert's assertion.

There was more to what he had done than a mathematical trick or logical ingenuity. He had created something new – the idea of his machines. [4]

The idea of the Turing machine as a model was based on thinking through what people did in the physical world –offering a bridge, a connection between abstract symbols and the physical worlds.

It was not an exact science, in the sense of making observations and predictions. All he had done was set up a new model, a new framework. It was a play of imagination like that of Einstein or von Neumann, doubting the axioms rather than measuring the effects. [5]

Turing's imaginings included a comparison between the computational potential of machines and the human brain. These theoretical speculations were put to practical use when Turing was recruited to the team at Bletchley Park at the outbreak of WW2 to work on deciphering the complex codes generated by the German Enigma

machines. The building of large computational machines at Bletchley designed to process numbers on an enormous scale, had stretched the available technology to the limits. These machines were dedicated to a particular task and the Universal Machine Turing had in mind would be adaptable to a number of tasks anticipating the programmable computer. This still turned on his original notion that two parallel ideas were in play one the mechanical processing and the other the instructional note.

In the aftermath of the war Turing dedicated his time to experimenting with early prototypes of the computer such as the ACE. But privately he was not allowed to enjoy peacetime, when his homosexuality put him on the wrong side of the law. Turing had broken the moral code by failing to be apologetic about his sexuality and maintain an appropriate level of secrecy about his liaisons. Homosexuality was illegal in the UK in the 1950s and his honesty nearly landed him in jail. To avoid a custodial sentence he agreed to chemical castration, which consisted of regular oestrogen injection to quell his libido. His intellectual achievements and contribution to the war effort did nothing to temper the harassment to which he was subjected leading to his suicide in 1954; a similar and controversial fate to that suffered by Primo Levi in 1987. Turing whose intellect and imagination had enabled him to be a major contributor to the development of the digital age was victimised by a legal system that outlawed him as indecent and impure. His creative line of flight was crushed by a moral panic that saw homosexual men as potential traitors.

3 Watson and Crick – Breaking the Code of Life

Alongside the early development of digital code to which Turing was contributing before his death, a major leap in understanding genetic code was taking place. The process of research that led to James D. Watson and Francis Crick's elucidation of the structure of DNA in 1953 destroys the myths of the rational and sophisticated process of scientific discovery. From the start their collaboration cut across disciplines, Watson originally studied Zoology and Crick came from a Physics background. Despite the fact that Nucleic Acids had been known for some time it wasn't until 1952 that Hershey and Chase conducted their experiments on the T2 phage virus that conclusively confirmed DNA as the genetic material.

At the time, biochemists that focused their work on DNA had little or no interest in genetics and conversely few geneticists were interested in biochemistry. Watson and Crick's first insight was to realise that the determination of the structure of DNA was crucial to understanding the coding of genetic inheritance. Their second insight was to gather already existing data from a number of sources.

Watson and Crick's method towards determining the structure of DNA was the interpretation of X-ray crystallographic photographs and their translation of their data into three-dimensional models. The account of the trial and error process of their research leading to the double-helix structure is reminiscent of studio based art practice.

To our annoyance, there seemed every reason to believe that the phosphodiester bonds, which bound together the successive nucleotides in the DNA, might exist in a variety of shapes. At least with our level of chemical intuition, there was unlikely to be any single conformation much prettier than the rest.

After tea however a shape began to emerge which brought back our spirits....admittedly a few of our atomic contacts were too close for comfort, but, after all the fiddling had just begun. [6]

Considerable controversy surrounded Watson and Cricks' reliance on the expertise of Maurice Wilkins and Rosalind Franklin crystallographers in the Biophysics Unit at King's College London to produce the images that confirmed the structure. Wilkins did eventually share the Nobel Prize but Franklin who had almost certainly produced the decisive images, lost out on the recognition having died of cancer in 1958. For many the question remains, in cracking the code of DNA did they also break a code of ethics, did ambition provide their line of flight?

Elucidation of the structure of DNA established the field of molecular biology providing an understanding of the processes that drive evolutionary change and the ability of organisms to adapt to changing environments. DeLanda has pointed out the contrast between the dynamism and flexibility of biological assemblage and the rigid inadaptable structures produced by assembly line production; two forms of reproduction one aiming at conformity and repetition the other at generating difference. [7]

4 Warhol – Embracing the mistakes

There has been much speculation by critics and biographers on the influences on the emergence of Andy Warhol as a key figure in American Pop Art in the early 1960's. The cultural cross infection at the time between London and New York is well established and undoubtedly Warhol would have been aware of the work of the London-based Independent Group and their appropriation of the alluring images of American consumer products, largely unavailable in the gloomy and impoverished post-war cities of Europe. Lawrence Alloway a member of the group is credited with first coining the term Pop Art. The irony that Pop Art as a product of consumer culture first surfaced outside America, would not have been lost on Warhol. It is one of the paradoxes of Warhol's practice that he injected irony into a culture where irony is largely absent.

Central to Warhol's appropriation of mass culture is an engagement with the technologies integral to the post war culture of consumption: print, photography, film and audio. His strategy in the Factory was to set in motion creative production that paralleled the industrial production and marketing of the new consumer goods. The purchase of a Model T Ford or a refrigerator guaranteed a new level of consistency, reliability and uniformity of product at a budget price.

Warhol frequently expressed his admiration of brand consistency in apparently throwaway comments such as, what's so great about Coca Cola is that it doesn't matter whether you are a bum in the gutter or the US president you can only buy the same Coke. What at first appears a celebration of democracy could equally be taken as an ironic echo of the US cold war view of the grey conformity of a Stalinist State in Eastern Europe. Elsewhere Warhol had also more directly identified with the machine age claiming:

*I think everybody should be a machine
I think everybody should like everybody [8]*

He alluded to the methods of the assembly line based on the principles of Henry Ford and Taylor's scientific management but his deployment of mechanical means of production was aimed at maximising accidents and flaws in the production process, which led to the most valued and retained outcomes. Gerald Malanga, Warhol's silkscreen assistant and collaborator recalls:

Sometimes, when making a painting we'd go off register when making a painting and there'd be a flaw. Andy accepted all that. I think it can all be boiled down to one statement "Embracing the mistakes" – accepting that which occurs spontaneously.....The flaws were part of the art. It was as if he possessed an almost Zen-like sensibility. [9]

The silkscreen printing process in an industrial context is aimed at perfect reproduction but Warhol 1960's silkscreen work is dominated by miss-registered images, over- or under-inked layers, moire interference patterns and poor reproduction of images re-scaled from the newspapers. These added textures not only create new meaning they highlight the mechanism of change through a break in the chain of perfect reproduction, a break in the code of repetition highlighting difference and multiplicity, through the 'flaws' sully the surface. Warhol's appropriation of images was influenced by Marcel Duchamp's notion of the modified readymade or found object. He adds a twist to this using the term 'leftovers' to describe the raw materials of his practice, adding the connotation of the impure, discarded or waste product of an urban, industrialised society from which his ideas take flight.

I am not saying that popular taste is bad so that what's left-over from bad taste is good: I'm saying that what's left over is probably bad, but if you can take it and make it good or at least interesting, then you're not wasting as much as you would otherwise. [10]

The prints of the early 1960's included not only the reworked images of everyday mass consumption such as the Campbell's soup tins and coca cola cans but also the images of death and disaster from suicide, car crashes to the electric chair. Death as a part of everyday reality clipped from the newspapers offers a content that is determined by chance and accident. The falling body in Suicide (1962), the suspended moment before death captured by the camera retains a paradoxically eternal sense of the virtual intensified by Warhol's enlarged silkscreen copy of the printed image in a newspaper, thus twice removed from the original photograph. In the series of car crashes the sudden arrested momentum of the car on impact and the destruction of its occupants as the frozen aftermath of the event still delivers a strong sense of chance and temporality captured in the fragile surface of the hit and miss reproduction of the twice printed image. The unpredictable timing and circumstance of death encapsulates the indeterminacy of life.



In 1963 the success of his printmaking allowed Warhol to diversify into film. His approach was deceptively naïve in filmmaking terms with the expressed intention of making paintings that move. He made use of a basic 16mm electric Bolex camera capable of approximately 3 minutes of continuous shooting and deploying a minimal set up of lighting and a fixed camera position. The postproduction on his early films was equally minimal, the editing process involving a simple non-selective process of assemblage with a near 1:1 shooting ratio.

One of Warhol's earliest films *Sleep* (1963), was an attempt to make an eight hour film of a man asleep, eschewing any cinematic compression of time in delivering the average, conventional duration of a night's sleep. His performer for the film was the poet John Giorna who allowed Warhol to enter his flat and shoot roll after roll of film while he slept. He was equipped with a camera only capable of shooting a 100 feet of film at a time. The final print fell short of the original intention with a running time of 5 and a half hours, this length only achieved by slow motion and the repeated use of the same footage. The finished film utilises these limitations coming close to Warhol's intention to produce a painting that moves, simulating a 'real time' aesthetic that prefigured the video camera and electronic surveillance. A similar treatment was given to a portrait of the Empire State building in *Empire* (1964), which through the use of a more sophisticated camera shooting 1.200 foot rolls had a running time of eight hours. The minimalism and repetitive structure of these films emphasised the audience as a dramatic and spontaneous element in their often restless and noisy responses to the film. In this way Warhol provided an ironic reversal of mainstream cinema, avoiding its predictable narrative structure and performance consumed by a passive and mesmerised audience.

Michel Foucault recognised in Warhol's prints a sublime stupidity in the repetition of images. His comments seem even more appropriate to his films:

But in concentration on this boundless monotony, we find the sudden illumination of multiplicity itself – with nothing at its centre, at its highest point, or beyond it – a

flickering of light that travels even faster than the eyes and successively lights up the moving labels and the snapshots that refer to each other to eternity, without ever saying anything: suddenly, arising from the background of the old inertia of equivalences, the striped form of the event tears through the darkness, and the eternal phantasm informs that soup can that singular and depthless face. [11]

Visitors to the Factory had routinely been photographed in a simple booth lit by a single photoflood lamp. This basic set up was subsequently used to film over 400 people in an archive of film portraits, which became known as *Screen Tests*. Some of these portraits were compiled into several films including: *13 Most Beautiful Boys*, *12 Most Beautiful Women* and *50 Fantastics*.¹ When projected in an auditorium the close up of the subjects' faces are enormous. Every tic and twitch of the subject trying to stare without moving or blinking at the camera is amplified into a major event in the minimal 'real-time' framework of the piece. Tears gathering on the lower eyelids in the harsh lighting become as dramatic as any sequence from a mainstream action movie as they finally tumble down the face. These involuntary filmic 'accidents' and 'flaws' engender an intense experience of temporality and the virtual. They also follow the creative logic of change in the flaws generated in Warhol's silkscreen prints.

Warhol's in his obsessive assemblage of Factory 'stars' in the early 1960's openly embraced the deviant and bohemian culture of lower Manhattan from drag queens to junkies, the human leftovers from which the imagination can take flight. The films, performances and photographs, parodied the Hollywood star system and complimented his silkscreen images of mainstream celebrities such as Elvis, Marilyn Munroe, Liz Taylor and Jackie Kennedy all subjected to the same improvised, and error-prone process as his car crashes and soup cans. This drive to subvert the codes of consumer culture while apparently appearing to celebrate and propagate them connects with Warhol's embrace of impurity and open transgression of the moral codes of the time, prefiguring the dynamic cultural shifts and celebration of difference that characterised the late 60's, after a decade of change in attitudes to empire, race, class, sexuality and gender. Ironically the success of his creative practice by the late 1960's had turned Warhol into a global celebrity and his creative production lost much of its subversive edge of improvisation and accident as he rubbed shoulders with the stars he once parodied from a distance. Yet a surprising departure shown in Documenta 7 in 1982 was a series of abstract pieces titled *Oxidation Paintings*. These copper-surfaced panels were corroded by drips and splashes of urine, which could very well stand as homage to Primo Levi's chemically inspired and subversive embrace of the productive forces of impurity.

5 Gerhard Richter and the Virtual Smudge

Richter trained as an artist in the GDR in the 1950's at the Kunstakademie in Dresden where the dominant style of painting was Social Realism. He crossed the border to West Germany in 1961 to study at the Kunstakademie in Dusseldorf. . Exposure to the complexities of contemporary art practices in the West created a crisis for Richter's own practice as a painter. Richter's response was to turn to photography as a source of images for his paintings, like many Pop artists in the US and the UK. But his deployment of photography was not directly concerned with the icons of consumerism it was driven by a more directly philosophical conundrum, seek

to justify the use of a potentially redundant image making technology. In 1960 the future of painting seemed at best uncertain or at worse doomed. Richter was also caught in an ideological impasse between the poles of the cold war the authoritarian communist state and market driven consumer culture.

For Richter the photographic image had achieved a state of pictorial perfection and a credibility that painting lacked because it was able to see 'objectively' it tells 'the absolute truth'.

Photography altered ways of seeing and thinking. Photographs were regarded as true, paintings as artificial. The painted picture was no longer credible; its representation froze into immobility, because it was not authentic but invented. [12]

Richter has amassed a large archive of photographic images compiled into a book titled *Atlas*. Some of the images are found or acquired; but the artist has taken most of the photographs himself. *Atlas* has been exhibited in galleries around the world independent of the paintings for which they are the source material. [13]



The translation of the photographic image into a painting by Richter is not an attempt to faithfully copy the image as in Photorealist painting. His strategy is to use the photographic image to create a painting that stands as a distinct autonomous object. The techniques he employs suppress the fine detail of the photo and usually its specificity but retain its generic quality: a family portrait, a landscape, an aircraft etc. The subject of the photograph is affectively de-located. When the subject is a portrait, identification and subjective qualities are suppressed by the translation into paint. In his early paintings Richter sometimes used photos of celebrities such as *Jackie Kennedy* (1962) and *Queen Elizabeth* (1967) but these portraits tell you little 'about' the subject.

In a portrait painted by me, the likeness to the model is apparent, unintentional and also entirely useless. [14]

His painterly process suppresses any feeling of inner life or as Richter puts it 'Soul', retaining only the superficial surface appearance of the subject.

Appearance, semblance is the theme of my life. All that is, seems and is visible to us because we perceive it by the reflected light of semblance. Nothing else is visible. [15]

The process emptying the image from obvious meanings such as points of potential emotional or ideological identifications paradoxically opens up the image to multiple interpretations throwing the struggle for significance back onto the spectator.

Pictures which are interpretable, and which contain a meaning are bad pictures. A picture presents itself as the Unmanageable, the Illogical, the Meaningless. It demonstrates the endless multiplicity of aspects; it takes away our certainty because it deprives a thing of its meaning and its name. [16]

Deleuze has argued that the delocating experience of war torn European cities in the wake of WW2 created the condition for the avant-garde strategies in the cinema and the emergence of the time image where time could be experienced directly through the image. These strategies in the work of filmmakers such as Alan Resnais and Margarite Duras re-coded the relationship between sound and image calling into question subjective memory tied to a specific individual through conventional flashback sequences. Thus challenging the audience to find their own meanings in the film.

Richter's manipulation of the painted surface deploys a smeared or blurring effect or a softening of focus that suppresses detail. This is achieved by dragging a dry brush or rag across the surface of the image. This fulfils the function for Richter of levelling the significance of elements of the image placing an emphasis on the quotidian and ordinariness.

I blur things to make everything equally important and unimportant. I blur things so that they do not look artistic or craftsmanlike but technological, smooth and perfect. [17]

In doing so Richter also emulates and amplifies in paint key characteristics of the technology of photography: the blurring of the moving object or moving camera travelling faster than the shutter speed, optical focus and depth of field inscribing time and space into the photographic image, angle of vision and framing providing a distinctive photographic composition in contrast with the pictorial painterly composition that pre-dates the emergence of photography. These technological gestures are gestures of potential, suggesting movement and change, a spark of hope, a virtual smudge from which the imagination can take flight. They work against Richter's declared intention to hover in an un-shifting state of uncertainty; rather they offer the spectator a potential line of flight, the possibility to use their imagination to create meaning and perhaps generate a gesture of impurity breaking the autonomous coding of the painting.

6 Impure Conclusion

Primo Levi's embrace of impurity and change was a powerful stand against authoritarianism and prejudice. But in the chemistry he created between art and

science in his writing, he also affirmed the creative potential of the cross contamination of ideas from one discipline to another.

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