



Don
Quixote
&
Site
Drawing

Ecovillages, incoherence
and tools

Don Quixote
Ecovillage, incoherence and tools.

By
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Site Drawing
GPS on architecture

By
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The thesis writing on ecovillages has been paired with a more recent contribution cowritten by Michael Caplan and myself. This paper is discussing the invisible influence the GPS technology has on our environments, its making and our experience in it. This publication pairs both to create a more complete understanding of the graduation project *Site Drawing*.

Finally, a note on the form of this publication: the choice of a paper publication on a cash register receipt is, in my view, a nod to the production-ecology pairing I'm talking about in this piece. The cash register receipt, symbol of outrageous globalized consumption, is hijacked here in the manner of a glitch to also propose an economical publication. An online version is available with the link at the end of the publication.

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Stimulated by a concern for catastrophic ecological urgency and a frustration with urban space as a study environment, this writing is rooted in one term: ecovillages. Expressing a concrete and pragmatic will, seeking a material solution, this paper is focused on rurality, techniques and tools. Looking for a place to land and grow an alternative out of it, the label “ecovillages” became intriguing. The term ecovillage can be qualified as a trend, thriving since the “Back to the land” movement of the 60’s or 70’s. In the late 1960s and early 1970s, almost a million people in the USA moved from urbanized areas to the countryside.

This movement is characterized by an agrarian return based on georgism¹ principles and rooted in the hippie counter-culture. Georgism being an economical ideology stating that people should own the value that they produce themselves, the economic rent derived from land (natural resources, the commons, and urban locations) should belong equally to all members of society. Ecovillages are small, self-sufficient communities that live following 5 main principles expressed by Johnathan Dawson, former president of the Global Ecovillage Network, in his 2006 book *Ecovillages: New Frontiers for Sustainability*²:
1. They are not government-sponsored projects, but grassroots initiatives. 2. Their residents value and practice community living. 3. Their residents are not overly dependent on government, corporate, or other centralized sources for water, food, shelter, power, and other necessities. Rather, they attempt to provide these resources themselves. 4. Their residents have a strong sense of shared values, often characterized in spiritual terms. 5. They often serve as research and demonstration sites, offering educational experiences for others.

These five principles are identified by the Global Ecovillage Network (GEN) and are the criteria to admit or not a place in the network: rare are the places that are exemplary on all these criteria, but what is nevertheless imperative is to express a desire and to try. This definition is intentionally broad enough to be inclusive and attract many places. From these five criteria, we can see identifiable ideologies: a non-institutional will; a strong communitarianism; a desired independence; a welcoming communication. Today, according to the Iberdrola group, there are more than 10,000 ecovillages in the world. The countryside attracts people for its economic appeal, far removed from the mad speculation of the city, but also for a certain quest for meaning, a simplification of daily life in a more intimate relationship with production - these are the words of the people who are leaving the cities, the neo-peasants.

In Gaspard d'Allens and Lucile Leclair's book of the same name, *Les Néo-paysans*³, they tell us that these neo-peasants account for 30% of new farms in France.

In a design lens, these places appears to be a laboratory of disruptive approaches in one of the most concrete way possible, testing how a group of individuals can thrive outside of the economic system in a broken world. As a generational trend, reflected through social media and emergent practices like vanlife, a growing appeal for rural lifestyle is spreading in Western society and ecovillages may see a resurgence in popularity. However, these places can be also the result of a radical political protest towards our modern city-life. It is important to categorize this label (ecovillage) as a product of Western society.

By contrast, our current modes of production and design are largely digital, interdependent, globalized and based on completely different models from that of ecovillages. At the same time as the previously mentioned “Back to the land” wave, the inventory control and material requirements planning (MRP) systems were introduced to the production systems layering the foundation of computer integrated manufacturing (CIM)⁴. Computed manufacturing is now a leading and promising process with applications in marketing, finance, product design, architecture, urban planning, information, transports and so on.

The introduction of computers has mainly enabled the creation of digital simulations, which can be used to test and confirm productions at lower cost. Beyond the efficiency and economy promised by digital processes, the ecological impact of digital technology is growing: mineral extraction, transport and energy consumption are all components of the digital entity’s carbon footprint. Ecovillages, on the face of it, are places reluctant and critical to the use of digital technologies, and work towards a pragmatic, low-tech ecology. But how dependent are ecovillages on technology? What degree of emancipation do they bring? Is it possible to apply their approach as an individual? How do materiality and technology convey ideological positions?

1. Henry George, 1879, Progress and Poverty, USA

2. Jonathan Dawson is a sustainability educator, currently working as Head of Economics at Schumacher College in Devon. Until recently a long-term resident at the Findhorn ecovillage and a former President of the Global Ecovillage Network

Jonathan Dawson, 2006, Ecovillages: New Frontiers for Sustainability, Schumacher Briefings, USA

The theoretical framework of this thesis is located within the work of Bruno Latour's hypothesis presented in the famous *Down to Earth* book. The responsibility of climate change as an active agent of the politics is both the theoretical origin of this writing and the theoretical origin of the subject of study. The loss of "common orientation" and its dramatic implications has directly stimulated the search for a "locality" to study. And this "locality" is constantly prospected with a global agent discrediting its aspirations.

Starting from an immersion in ecovillages between France and the Netherlands, this thesis demonstrates how technique and materiality from ecovillages question our relation to digital production in an ecological concern. This questions the method: how to understand through a digital lens the ecovillage/off-grid movement? But it also requires a preliminary answer to the question of why: why the off-grid movement is a urgent/important matter for our technological relationship?

First, in *Mad Max*, from the observation of a Dutch ecovillage, we will see that resource autonomy promoted by the off-grid movement is political/militant and can be taken to the extreme of transforming the home into a spaceship. Yet this methodology, coupled with the DIY ideology, will be proves incapable when applied to recent technological tools such as Lidar technology. The sought-after sovereignty will end up in a confrontation with industry and will reveal the ecological inconsistencies on which digital creative practices are based.

Then, in the Chapter 2 called *Christopher McCandless*, we will observe the testimony of the *Sainte-Camelle* ecovillage, its community operation and its material realities repositioning the response to climate change.

This place refocuses on urgency and pragmatism and will illustrate how our technical panel is open to criticism. These reflections on production are reflected to the practice of spatial design exploding the ecological incoherence produced by the computer (the central tool) and stressing the question of time/speed.

Finally, in Radical Edward, through a third location and parallels to digital architecture, after establishing the pairing between technological progress and architectural services, we'll identify points of influence and possible bridges between computation and ecovillage ethics with, in particular, the questioning of the author-individual and the creation of affective narratives as a new way of navigating the local.

3. Gaspard d'Allens and Lucile Leclair
Journalists for the site Reporterre, the book is a compilation of journalistic surveys.

Gaspard d'Allens and Lucile Leclair, 2016,
Les Néo-paysans, Reporterre, France

4. Dimitris Mourtzis, 2009, Digital manufacturing: History, perspectives, and outlook, Patras, Greece, https://www.researchgate.net/publication/228365744_Digital_manufacturing_History_perspectives_and_outlook.





Chapter 1- Mad Max

From the Global Ecovillage Network (GEN), the predominant European organization connecting and supporting ecovillages, a map of Netherlands communities was found. Thanks to it, I was able to meet Erik, the founder of Peter Pauw (PPauw), an ecovillage near Wageningen that is completely self-sufficient: the water, heating and electricity used is strictly generated by their land (although food is sourced off-site). Around a “football team” is living constantly on the site. An open clearing with a variety of plantations and houses scattered in the surrounding woods but this place is unique in its dedication: beyond its autonomy, it’s its creation that is a rare journey among ecovillages: it started out as an anarchist squat and after almost ten years is now moving towards legalisation and buying back the land. The anecdote Peter told me was that “when they took over the site, they organised workshops to build tree houses, inviting the local police to come along”. These workshops served to demonstrate the economic cost of their eviction because they had to be dislodged from the trees. The interview covered the technical realities, the struggles, and the influence on the local communities. Erik took me on a tour and showed me the devices and habitats built with ingenuity and resourcefulness. They have set up a phytodepuration system using a range of plants including nettles, a solar machine that converts compost into gas, a thermally passive communal building and a number of tools that use bicycles to power them mechanically. Because of their positioning on the fringes of the law, these designs are far away from standards and regulations.

The site's collection of systems offers both comfort and responsibility because these devices produce a limited contribution that varies according to climatic conditions.

In *Perspectives Low-tech*⁵, co-written by Quentin Mateus and Gautier Roussilhe, a French engineer and researcher, technology is analysed through the lens of history and economics.

“The environment, understood as both the ‘natural’ and the material world, plays a key role in the anthropology of technology. In this context, the global environmental crisis can be seen as a fundamental change in the ‘milieu’. It is therefore legitimate to ask how this crisis is modifying the production of technical systems and even the anthropological method. The unprecedented level of transformation of natural environments and the environmental damage caused by the technical systems of modern industrial societies are profoundly changing the way we perceive technical systems, breaking down the conceptual barriers between technology, nature and culture.”

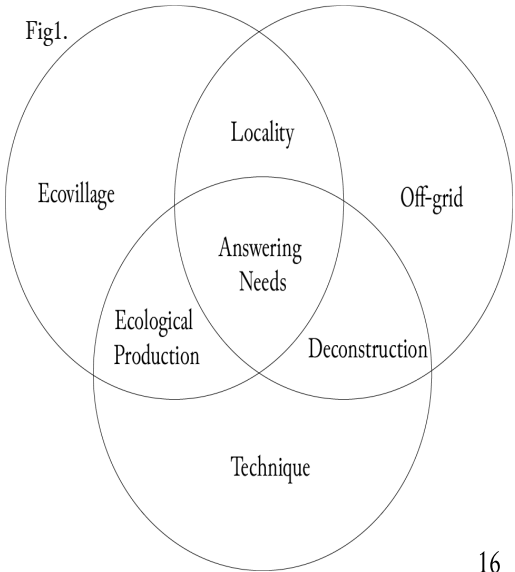
But technique and technology are not neutral, and the choice of which tool to use is a political one, what is induced by this is that the technologies we use and rely on do not follow their own logic of ‘progress’, according to which performance and innovation regulate the tools we use. For example, the electric car is not an innovation but a technology dating from the 19th century that was not democratised because the interests of the industrialists of the time were in the combustion car and the exploitation of oil⁶. The current tools deployed in ecovillages are updates of ancient techniques and traditional know-how, such as solar ovens and earth-and-straw construction. This ecology of tools is therefore also a position vis-à-vis the dominant capitalist system. The extract above demonstrates the role of our technical relationship

to the world in the dramatic ecological context: this crisis expresses an unprecedented change in our living conditions, and this reconfigures our technical response. “*In this sense, techniques are not neutral and, in the words of François Jarrige, «transport trajectories and constantly shape the field of possibilities for action»*”. This observation puts ecovillages and their politicised relationship with production into perspective. What is technical progress in the ecological struggle? What choices are made when building an ecovillage? But the duration of the squat is not indefinite, and the town hall has finally asked for the site to be evicted or for the settlements to be regularised. The residents of Ppauw have opted for the second option and for the past year have been working with partners to sketch out what the site will look like. However, in a televised interview⁷ with Pablo Vanneste, the person who is organising PPauw’s turnaround. When asked by me about autonomy, he replied “*that no healthy community is closed on itself*” but “*that some systems will be maintained*” meaning that some autonomous systems such as water treatment could remain in place, but the majority of the site will be connected to the national networks, calling into question the initial intention to create an autonomous site. In fact, during the interview, Peter said that this place started as a demonstration: “*We ended the demonstration with squatting this terrain.*” The demonstration survived for 15 years and this institutional and framed turn-around which was negotiated instead of the expulsion is, probably a successful conclusion for this demonstration.

5. Quentin Mateus and Gautier Roussilhe, 2023, *Low-tech perspectives: How to live, do and organise differently: How to live, do and organise differently?*, Editions Divergences, France, p44

Stepping out of the so called “grid” is also a fundamental condition of militantism. Once somebody don’t need the system anymore, the power of dominance between this person and the government is horizontalized. Being “off-grid” is a term meaning completely disconnecting the home from the national energy grid and relying solely on the energy generated from the household system. It can be electricity, water, heat or also food (not relying on economical exchanges). It is an act that can be stimulated by many reasons from doompers to religious believes (Mormons), economical precarity or ecological engagement; being off-grid is essentially a collection of practical solution to the Maslow’s hierarchy of needs. It refers to the principle 3 of the 5 principles defined by Johnathan Dawson and mentioned in the introduction (Their residents are not overly dependent on government, corporate, or other centralized sources for water, food, shelter, power, and other necessities. Rather, they attempt to provide these resources themselves.) many ecovillages are involved in the off-grid act.

Fig1.



In this principle, the term “overly” is important: it’s a measure as illustrated on the diagram below (fig 1): ecovillages are not just about the off-grid but use or «are part of» the off-grid movement. The common factor is the locality of production to meet comfort requirements. The contemporary off-grid movement has been widely influenced by architect Michael E Reynolds, who in the 1980s conceptualised the “earthship”:

“If we learn to live without these systems, we could radically slow down destruction of the planet and possibly reverse certain aspects of the deterioration. If it is already too late, we will need, in the near future, living units to sustain us via direct contact with existing natural phenomena. We need to evolve self-sufficient living units that are their own systems. These units must energize themselves, heat and cool themselves grow food and deal with their own waste. The current concept of housing, in general, supported by massive centralized systems, is no longer appropriate, safe, or reliable. We are now in need of “Earthship” independent vessels — to sail on the seas of tomorrow.”⁸

Michael Reynolds has conceptualised and condensed all forms of autonomy and ecological techniques in the home, elevating the house to the status of a ‘vessel’. He actively worked in the DIY ideology (“Do it yourself” (DIY) is the method of building, modifying, or repairing things by oneself without the direct aid of professionals or certified experts) The DIY ethic deserves a closer look: it insists on an independence based on the idea that everyone is capable of anything. It works through collectivism and a punk division of production⁹.

This ethic has spread through zines or blogs and exists in these information objects, following this ethic Reynolds becomes then an architect-practitioner-builder and founds a school.

The quote above, published in 1984, is unapologetic: the ecological crisis will bring so much upheaval that the only way to live in this world is with a vessel capable of protecting us. The Earth will become alien and we will not adapt quickly enough to the change. He influenced many communities in the United States, particularly in Arizona and New Mexico, often in arid zones, choosing to live in a desert just to get used to it. This autonomy is promoted and aspired to by most of the ecovillage inhabitants I have been in contact with. Being off-grid starts with sovereignty over resources, but also over the tools used to acquire these resources. As an introduction to active research, this 'off-grid' process was applied to technological tools used in spatial design. The first exercise established was building a nomadic wind turbine, designed by Adrian Cubas and published on Hackaday (a low-tech and DIY project hosting site). Building a wind turbine and using its own energy to fuel a spatial design practice raises the connection between responsibility and creativity. The current practice of space design is highly digitised and dependent on this digitisation. But the most important stage in the design process is the documentation and representation of what already exists. Satellite views, maps, cadastres, and photos are used as a resource to transfer the space into a digital model. More recently, the introduction of photogrammetry has become very seductive using the latest Ipad Pro Max with the help of paying applications such as Sketchfab or Polycam. The user 'scan' the environment around themselves.

6. David Egerton, 2006, *The Shock Of The Old: Technology and Global History since 1900*, Profile Book, England

7. Interview with Pablo Vanneste on Whatsapp, september 2023

One of the technologies it is based on is LIDAR (Light Detection and Ranging), which uses a laser and a triangulation method based on the distance between the laser and the object (calculated by the distance/time ratio). It is now used in autonomous hoovers, some smartphones and even autonomous cars, and is already being used by geographers, town planners and forest management organisations to visualise large, complex areas. This ‘high-tech’ technology is quite expensive, yet on the site Hackaday.io, introduced earlier, a good number of people have launched open-source Lidar projects, or low-cost lidar or simple 3D scanners, etc. This meticulous deconstruction of a recent technology that is difficult to manipulate leave speculating about possible ‘hacks’ of this technology. Choosing to reproduce Caver.Adam’s project, which began in 2016 and was be completed in 2021. The LIDAR scanner uses a Cartesian grid as a model for reconstructing the scanned space. The Cartesian grid is a recurring theme: the electrical grid, the infrastructural grid, the cadastral grid, the mathematical grid. This grid form can be attributed to René Descartes, who, thanks to this reduction of the complex world, made it possible to think of mathematics applied to nature, to the environment.

The justification behind the Lidar construction lies in the concept of groundtruth¹⁰: when a reality is represented by any means (map, photography, models) there is a translation which deforms the “truth” and produce a biased point of view. With the Lidar, by spinning in every axis and only analysing the geometry, it is an attempt to stay as close as possible to this groundtruth.

8. The first book in the Earthship Volume Trilogy written by Michael Reynolds.
Michael E Reynolds, 1984, Earthship Vol1, USA, p3

But what was learned during the process of making it alone is as important as its future utilisation:

*“In its willful naiveté, this ornamented vision is inflected with nostalgia for an imaginary, bygone time when tech was tinkerable and free from mass production and standardization. Broadly speaking, this imaginary past belongs to an Arts and Crafts lineage that fetishized the artisanal and the DIY, often on the part of hobbyist upper classes with too much time on their hands.”*¹¹

Elvia Wilk is a New York writer and editor whose work includes *Oval or Death by Landscapes* (“fan non-fiction” about living and writing in the age of extinction), in this article published on Eflux about the Solarpunk movement. She reminds us of the current condition of technology: mass production and standardisation.

Two cages that delimit the low-tech approach, ecovillages and solarpunk. And this condition cannot be circumvented by a nostalgic and privileged illusion of a return to craftsmanship. Most of the tutorials, the wind turbine and Lidar business I have undertaken rely heavily on Amazon and Chinese production, and this handicaps the initiative in its ecological coherence. For example, both projects were designed by Americans, sourcing components from American sites not operating in Europe.

During the almost archaeological digging online to find all the components to order, using Amazon or sites like Aliexpress is almost unavoidable if you want to keep the cost of the project down. Once, an order for a solar panel resulted in the delivery of a Christmas book, the kind that makes music when you open it. It’s anecdotal but it reveals the level of control we have if we want to do the technical production of tools ourselves. The level of submission is such that it makes it almost absurd to attempt to create a Lidar scanner yourself.

The costs, transport times, errors, stockouts and updates all add up to an insurmountable mountain if you want to go beyond the current low-tech field. On the other hand, building your own set of tools is a great learning experience, and the educational impact of this approach is enormous. From electrical engineering to Arduino mechanics and programming, you discover fields that you unconsciously rely on, but which are by no means guaranteed.

From Peter Pauw's analysis of the ecovillage, we can see that resource autonomy is political and militant and can be taken to the extreme of transforming the home into a spaceship. Yet this methodology, coupled with the DIY ideology, proves incapable when applied to recent technological tools. The sought-after sovereignty ends up in a confrontation with industry and reveals the ecological inconsistencies on which digital creative practices are based.

9. Dr Russ Bestley, 2017, *Design it Yourself? Punk's Division of Labour*, UK

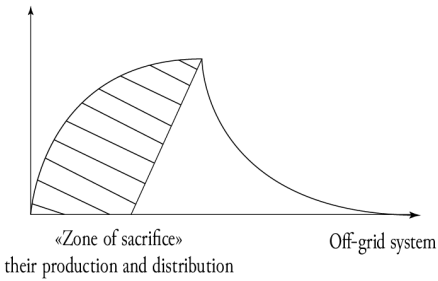
10. Pickles, John, 1995, *Ground Truth: The Social Implications of Geographical Information Systems*,

11. Elvia Wilk, 2018, *Is Ornamenting Solar Panels a Crime?*, E-flux, <https://www.e-flux.com/architecture/positions/191258/is-ornamenting-solar-panels-a-crime/>

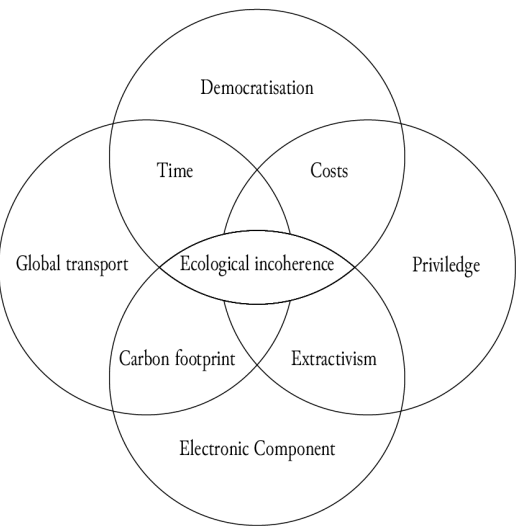
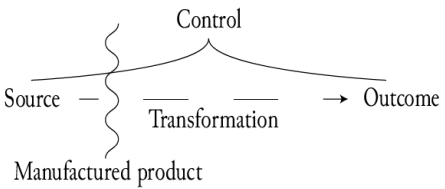
Fig2.

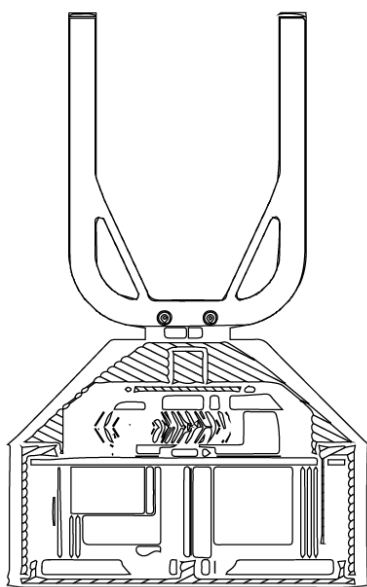
Ecological impact of off-grid system in relation to time.

Ecological impact



Limit of control in DIY process





Light detecting and ranging
LIDAR













Chapter 2- Christopher McCanderless

This initial attraction to ecovillages manifested in a visit to the Oasis festival on the 23rd of August (Oasis being the French network of ecovillages since 2017). The Oasis festival aims to bring together residents of ecovillages, thinkers and people attracted to ecovillages who wants to “transition”. It was hosted in the ecovillage Sainte-Camelle in Arrièges, a mountainous region at the Spanish border. My stay lasted 4 days and got accounted with a lot of different actors of this scene: writers, teachers, organisers, founding members of ecovillages, town councillors. The simple act of offering a festival for 500 people strike me in the ecological context, because the festival format is notorious for being consumerist and extremely polluting (transport, impact on the site, waste). The challenge was enormous for the hosts but achieved using unconventional methods (the kitchen for example was vegan and served food of a very good quality, but it only needs a look to see it will not pass a sanitary control). The site was filled with art and spiritual items from small decorations to several octagonal pavilions used for different communal practices. As soon as I arrived at Palmier station, the nearest train station to the ecovillage, a couple approached me and asked if I was also going to the festival. While waiting for the bus, a group quickly formed, based on this obvious physical recognition (probably the backpacks helped). But during the first evening meeting, the sociological observation was clear: almost all of them are white, with a large majority in their sixties. Ecology is a movement of the left and often of academics.

While ecology is fundamentally concerned with the well-being of the planet, the movement's association with the left and privileged classes is correlated by factors such as access to education, environmentalism as a luxury, urban dynamics, political influence, green consumerism, and representation within the movement as identified by P. Bourdieu¹² in 1984. He identifies the correlation in the social space between cultural capital, economic capital, and interest in ecology, based on social sciences and therefore on samples of the French population, and places ecology where people have high cultural capital and low or medium economic capital. It also places the so-called "left-wing" movement in the same space.

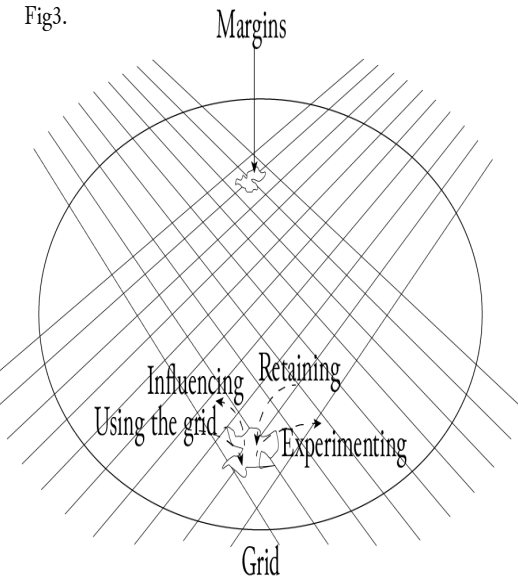
What's more, the primary requirement for an ecovillage is the purchase of land: this condition structures and limits the whole movement. The ecovillage is not intended to be illegal even if many criticise the concept of private property, but from what I've met during the festival, the majority opt for the creation of a common legal structure that will own the land: the residents therefore have a share in the society that corresponds to their 'land', which smoothens out economic inequalities and abolishes conflicts of individual interest. Obviously, if one of the members decides to leave, this can lead to a major deficit in the tax structure (if a person who has generously contributed to the capital of the global structure leaves, he will want to recover his initial investment and will force the other partners to make up the shortfall).

12. Pierre Bourdieu (1930-2002) was a French sociologist and public intellectual. P. Bourdieu, 1984, Social space and the genesis of 'classes, Acts of Research in Social Sciences, France



Despite these schemes of mutualisation, money is a major obstacle, as banks are reluctant to lend to an ecovillage, which limits the people who can aspire to it to those with a certain amount of capital. Nevertheless, the festival was not lacking in self-criticism and constructive ideas to promote social and economic inclusivity, including collaborative work with HPF (Habitat partagé France, a social housing structure in France) to house precarious people wishing to live in community. I was also surprised to see an impressive diversity of situations at this event. Ecovillages are a label embracing a very wide variety of places, from young neo-peasant families to historic, radically ecological groups. From an anarchist squat to an old pensioner wanting to do some gardening. Finally, to close the day's activities, a debate was held every day under a large marquee: the lectures at the festival are also a portrait of the French movement: politics, the ecological narrative, economic friction, the link with the land, horizontal management of a community are just some of the recurring themes. Later in the evening, I had a chance to chat with Guillaume Faburel, Ludovic (one of the festival organisers) and Thibaud (a resident of an ecovillage in Brittany), and we discussed the limits of the movement and possible improvements, but one thing stood out for me: Thibaud was feeling frustrated because a number of ecovillages had recently sprung up in his region and he said that they were "*stepping on each other's toes*" because these places were competing for the same audiences (for tourism, workshops, events) and lacked cross-functional organisation! In short, Thibaud complained that there were too many upstart ecovillages that didn't take the time to establish themselves smoothly; then, beyond the criticism of upstarts, it's a reminder of the condition of margin

Fig3.



(limited in exclusivity) re-calling the definition of these places expressed by Anne M Scheider¹³ in Off-Jefferson's Grid: "*But the fill-in-the-bank spaces of the grid coupled with the remoteness of the American countryside meant there were holes large enough for utopias to slip through*".

This dream of the margins, of a possible reality outside the grid, is what fuels ecovillages too. From the various discussions and encounters I've had during my fieldtrips, there is no clear consensus: this dream is nuanced, and that the majority recognise the utopia. The quote above from the Countryside Report brings back to this dichotomy of scale: these are realities on the margins, living in the cracks of a system, almost like parasites. Being off grid is a relationship with the dominant system, it's always "in relation to" and doesn't exist without the grid. This question of expansion often comes up as a limit to the off-grid movement and mostly: without the grid (electricity grid, transport grid or water grid) the sites on the fringes would simply not exist.

But the ambition to grow demographically, to convince the dominant system, is maybe just a resignation and an admission that the societal change they want ecologically is impossible.

The members of the ecovillages I encounter recognise it and respond with activism and local negotiation: they invite the local farmers, they negotiate with the town hall for an event or a regulation, they do educational work with the village primary school. They become enough of a social force to bend the grid.

13 . Anne M Scheider is a professional artist and designer with a Masters in Landscape Architecture in Seattle. Off-Jefferson's Grid is a chapter of the book Countryside: A Report by AMO (AMO is the research, branding and publication studio of the architectural practice, founded in London in 1975 by Rem Koolhaas).
Rem Koolhaas, 2020, Countryside Report, p291-292, Taschen edition, Germany



Despite the slow pace at which ecovillages are being built, which is not at all in line with the immediate reaction required by the ecological emergency, the roots of change also need to be embedded in a longer timeframe. However, this accelerated timeframe, this immediate mobilization, is also possible and in line with digital technology and its tools.

Democratic slowness, the failure of states and COPs since the Earth Summit, would thus be reproduced in ecovillages. From another point of view, slowness is the main argument of the post-growth or degrowth movements, advocating a slowdown in our modes of production and consumption. In the article *Accelerationism and degrowth*¹⁴ written by Aaron Vansintjan, after deconstructing the argument of increasing productivity saving resources with the Jevons paradox¹⁵ (when technological progress increases the efficiency with which a resource is used, but the falling cost of use induces increases in demand enough that resource use is increased, rather than reduced). He expresses the degrowth ideology in relation to rational management:

“Degrowth takes as a key question the ‘metabolism’ of the economy that is, how much energy and material it uses. [...] degrowth is predicated on politicizing limits that, until now, have been left to the private sphere.”

Degrowth thinking's response to the capitalist production system is deceleration accompanied by rationing. After sobriety (already practiced to the extreme in some ecovillages), rationing would therefore be a necessary management mode applied by the public. The question of speed opens up a friction between the relevance of ecovillages and the ecological emergency.

14. Aaron Vansintjan, 2017, *Accelerationism and degrowth*, Degrowth blog, <https://degrowth.info/en/blog/accelerationism-and-degrowth>

The host ecovillage is a community of twenty or so inhabitants with an expressive spirituality who have renovated an old building: the founding couple are therapists and manage the community with a careful eye on themselves and on conflicts: for example, if there is a conflict within the group, they have different therapeutic methods for resolving it. They also maintain an intimate relationship with the estate's forest, decorating it and erecting numerous symbolic totem poles within it. The site is located on a hill in deep countryside, surrounded by wheat monocultures. The soil is mainly clay and their current priority is a water recovery system. They live in ecological sobriety which means a rigorous alimentation, minimal use of resource such as water but also the use of car. They consider the footprint of every action their daily life is generating. They don't buy new items unless it's a necessity and use phones or screens as little as possible. They are developing a wide range of activities, including tourism, a community bar and permaculture, and now have big ambitions. They want to build a large auditorium, develop more resource management systems, welcome senior citizens, etc... 15 years of installation and work have enabled them to finally ensure a «minimum wage» without the need to work in structures outside the ecovillage: each resident receives a monthly payment of 300€ from their activities of tourism, event hosting and little sells of artisanal productions (they don't pay anything for their monthly expenses within the community).

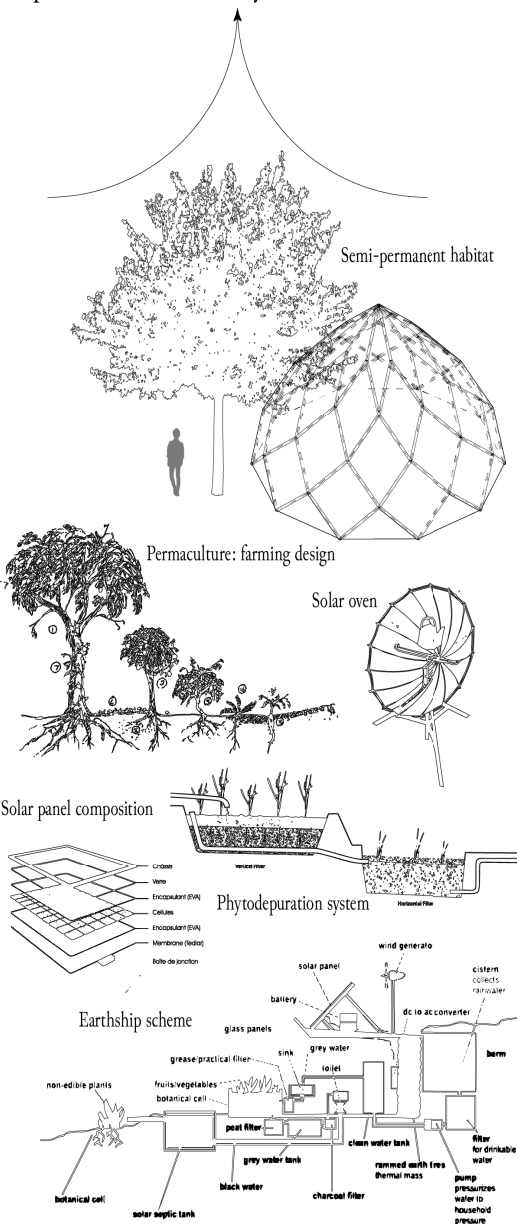
During my stay, the thermometer reached 42°C for two days with a severe drought at the end of August, then suddenly dropped to 23 with a thunderstorm and heavy rain.

Instantly, many of the devices that ensure our comfort were out of order, such as the solar shower but also a lot of the temporary habitats were out of use. The reality of ecological living is that they are much more dependent on our environment and climate (fig 4). This is a worrying condition when seen in the light of the IPCC reports demonstrating the increase in extreme meteorological events. This experience of submission to rough climate phenomena within the ecovillage expresses the rapidly changing conditions in which we are evolving and shows that the technical solutions to our needs must be capable of an unprecedented resilience. Sainte-Camelle's (the ecovillage hosting the festival) approach to design is organic and slow: they test devices, pavilions, and tools from the temporary and the salvaged (which they recover thanks to a national system called the Ressourcerie, a voluntary sorting and redistribution service), and then, when it's possible and even prolific, they consider the long term and standardisation. They allow themselves time to play, to make mistakes and to discuss things, something that sounds like a luxury to architects. During the festival I met Camille Behaghel, an architect who now specialises in ecovillages and their support. He gave a workshop on architecture in which he presented his projects and his approach: he based his interest on the fact that the architect knows (about standards, legislation, the world of construction) and that this is his strength, that of an advisor or ally of ecovillages against construction agencies and town hall design offices, which often prohibit or hinder the construction of eco-responsible buildings.

He explained that his method consists of coming to live for at least one or two weeks in the place in question and talking with everyone before drawing up his sketch.

Fig4.

Dependance and sensibility to the environment



This gentle approach is rare in the architectural world and create a programme in harmony with the site and its inhabitants. However, this discussion is based on digital processes that act as a support for consultation: the 'impact' of the computer on practice is mainly in terms of communication and the speed with which different profiles can interact and understand each other: engineers, design offices, architects, consultants, builders, clients and so on.

The testimony of the Sainte-Camelle ecovillage, its community operation and its material realities reposition the response to climate change. This place refocuses on urgency and pragmatism and illustrates how our technical panel is open to criticism. Finally, these reflections on the practice of spatial design explode the ecological incoherence produced by the computer (the central tool). It questions the tools which are used to produce spaces, objects, and projects. Digital design software is king: Rhinoceros, Sketchup, Solidworks, AutoCad, Adobe Suite, are the main design interfaces. Spatial designers measure and extract data from a site, then design behind computers, and finally, produce and out-source. These processes are made possible by global transport and standardised production, and they are confined to these areas. Low-tech, open source and material research could provide a fragment of an answer.





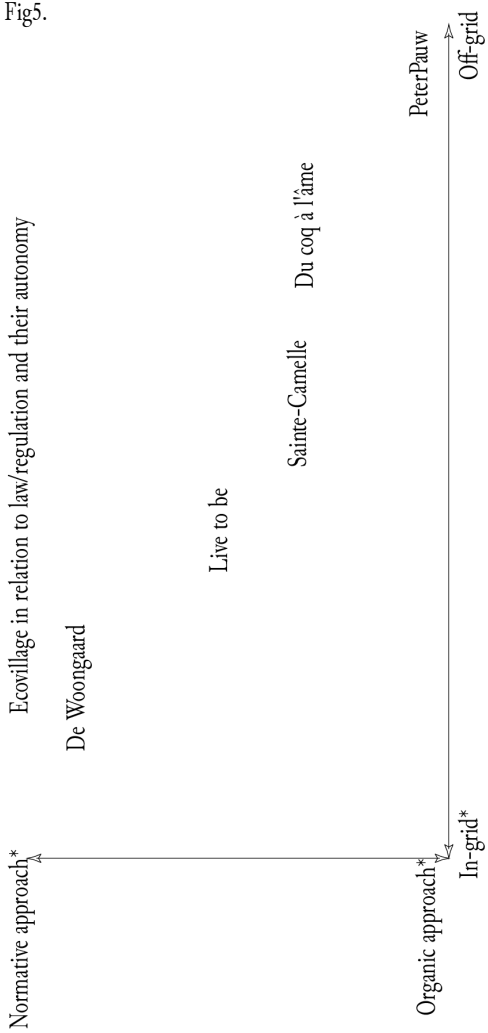


Chapter 3- Radical Edward

The aesthetics of Sainte-Camelle and PPauw are similar and representative of one scope of ecovillages: the naturalism and primitivism. It's DIY, practical, rudimentary, it uses upcycled materials and very little digital processing. Philippe Rahms argues in *Le style anthropocène*¹⁶ that 21st century design will be practical, and its mission will be thermal comfort. He explains that modern construction and industrial design have been designed around access to fossil fuels and unlimited resources, reducing interior architecture to beauty. With today's precariousness and urgency, interior architecture, materials, and certain low-tech techniques will be re-qualified to guarantee comfort without fossil fuels. If Rahms takes the designer out of an anthropocentric view and proposes to define the great designer of the 20th century as oil, a resource, then what is the technological advance or the resource marking design today? This raises the following question: can digital architecture emerge from precariousness as the designs of the two previous ecovillages?

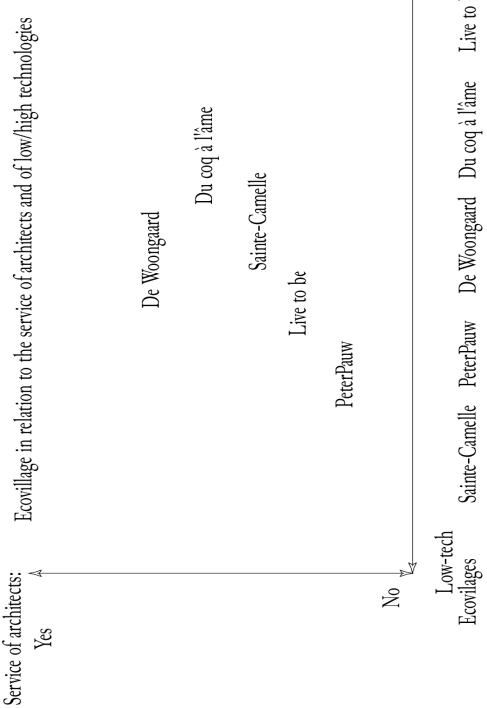
16. This manifesto, at the crossroads of architecture, aesthetics and engineering, calls for a revival of the practical sense of interior design that existed before the 20th century. Philippe Rahm, 2023, *Le style anthropocène*, HEAD, Genève

Fig5.



Organic approach* : relation to law and regulation
In-grid* : relation to self-sustainability with off-grid being almost autonomous

Fig6.



These two graphs place the ecovillages analysed during my research in dialogue, the first correlating the service of an architect in site planning with the ecovillages' relationship to technology. The high-tech/low-tech spectrum is to be taken figuratively, however: low-tech is more a question of technopho-bia or reticence than total rejection, and high-tech does not symbolize the extensive use of artificial intelligence and robotics, but rather a less critical use of technology.

The second diagram relates the position of ecovillages in relation to laws and regulations to their autonomy. This diagram shows a correspondence between growing autonomy and non-compliance with planning laws and standards.

They are based on observations and discussions and not on quantitative data.

This relationship between architect and technological progress is the breaking point to which these observations on ecovillages lead. After the off-grid movement, the ecological emergency and the DIY ethic, what position can digital practices take in this landscape?

In the Netherlands, perhaps more so than in France, there are places that are much less 'disruptive' and which, for all that, are developing every day, local responses. On the 21st of September, I had a call with a young one located in Zeeland (NL) called De Woongaard. I spoke to Robbert, a resident of the ecovillage for the past year. This ecovillage is also an example of rationality allowed by a digital process: the architect ARCHI30 has designed three types of passive house (larger or smaller) and this grid is the identity of this ecovillage. The houses are passive in terms of energy and a water system is in place. However, they are on the urban cadastre and because of this categorisation cannot install different systems such as dry toilets. Their testimony is very rich and contrast with the previous two places described: they had support of the municipality; their place is entirely designed by an agency and they use the term of eco-luxury (in contrast to sobriety) to describe their way of life. The term eco-luxury comes from the economic sphere mainly in tourism and luxury brands, using authenticity and high-quality as their main selling arguments: raw materials and craftmanships.

The ethical quality of this term is debatable, both because of the association between ecology and luxury (arguing that ecology cannot be dissociated from social justice, which luxury is detrimental to)

and because of greenwashing, with a façade of ecology: systems and services that are often dangerous for the planet, such as the hotel industry or fashion, are not called into question, but are given a “sustainable” finish. This begs the question: is De Woongaard’s ecoluxury or “comfortable condition” supported and enabled solely by ARCHI30’s digital design?

Beyond this connotation, the term eco-luxury leads us to think about the narratives surrounding ecovillages: digital modes of production can serve a more seductive narrative of these places.

This effect of digital technology on architecture is to reflect on the reality of ecovillages, an effect that can be summed up by Martin Bressani’s (Associate Professor and Graduate Program Director at the School of Architecture, McGill University, Canada) contribution to a debate between Martin Bressani, Mario Carpo, Reinhold Martin and Theodora Vardouli, led by Antoine Picon¹⁷.

“Taking its cue from cinema and advertising, architecture is increasingly seeking to create a totalising atmosphere, and affective spaces. With the disappearance of major narrative sequences, and the deterritorialisation of the world as a result of virtualisation, it is affect, or affective cartography, that enables people to know where and how they can situate themselves in the world and in their lives. Thanks to new visualisation and modelling tools, architecture is increasingly seeking to manage our affective identities by transforming the material world into a subject of concern.”¹⁷

I’d like to dwell on the pivotal phrase in this quote: “the deterritorialisation of the world” which is exactly the theoretical reason speculated in the introduction justifying the neo-peasant trend.

Anchorage to a territory in the metropolitan context is fading: identity, proximity and, more generally, a sense of community are the arguments for attracting rural communities and, by repercussion, ecovillages too. "Affect" though generally a concept distant from technology, is of double importance here: it is possible for architecture to generate affect through visualization tools, and it blurs the boundaries between architecture and entertainment, in other words between reality and fiction. Where the context of the study, from the beginning of the research, was formalised in a practical and precarious world where the imaginary and affect had no field of action; this thought of 'digital architecture' and digital representation as being able to guide affect restructures the potentials.

If building a windturbine answers the need of power, a Lidar is acknowledging the need of capturing. This acknowledges that transferring the environment into digital form is a necessary condition for spatial design today. But Lidar is interesting because it can produce an organic representation that can embrace the non-normative context of ecovillages and allows us to move away from the satellite or cadastral top view. To what extent is digital representation necessary and what does this act of wanting to appropriate this technology is expressing? In the same debate led by Antoine Picon¹⁷, Theodora Vardouli (architect and scholar of design in its entwining with digital technologies and computation) sets out a definition of digital architecture:

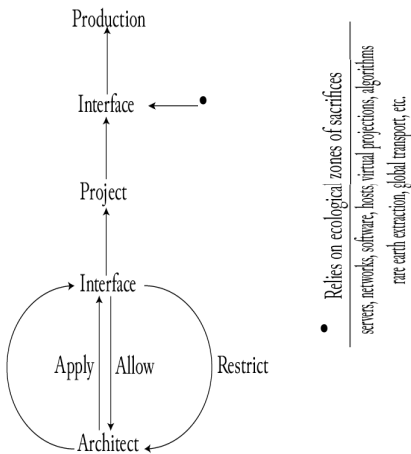
“Digital architecture is architecture produced through the use of computers and other digital tools». Such a definition puts at the forefront, not the disembodied idea of a digital ‘era’, but the many materially and culturally situated acts that constitute it. While it is factual, it is not simple, insofar as there is nothing simple about the notion of use: it presupposes users, it requires something to be used, and it is always productive, of things as well as of subjects”.

This definition stresses the terminology of “use” and “user”: a user is someone who consumes and/or uses a product and/or benefits from a service. The user is therefore inevitably second, whereas architecture, in its traditional understanding, wants authors to be first. And this desire to place the human being as the primary generator is reflected in the low-tech movement, off-grid thinking and the context of ecovillages.

What was illustrated by the Lidar construction process is that, despite the low-tech and open-source approach, unless you are at the

source of production of all the components, the margin of control and dependence on the industrial system remains almost identical and puts you once again; second. (fig7).

Fig7.



- Relies on ecological zones of sacrifices
servers, networks, software, hosts, virtual projections, algorithms
rare earth extraction, global transport, etc.

creating users instead of authors

Whether with tinyhouses, Ker'terre houses, yurts or atypical real estate, uniqueness and original identity is a strong factor in the ecovillage landscape, and this sense of authorship is alternative. Ecovillages, while retaining the value of authorship, reconfigure its organization. The Death of the Architect by Rob Tönissen¹⁸ examines the influence of digital technology on the practice of architecture, and shows the transformation of authorship in an opensource "bazaar" organization that is no longer individual and geolocalized, but questions ownership itself.

"bazaar network model therefore questions the basis of the organisational structures in the modern and postmodernism "cathedral" systems that are still present and based on the right of copyright and intellectual property the legal protection of authorship."

Borrowing the bazaar-cathedral analogy from Raymond (1999) to describe governance, he explains the change in architectural discourses from the cathedral to the bazaar : an anarchist model of horizontal self-organization, where each space is negotiated on an ongoing basis. He then goes on to take up the Roland Barthes author-god pairing: *“Consequently the mode of authorship in this open source discourse has shifted from the author-God (closed traditional structures), where the author is taking the centre stage, to the author as mediator (open structures), where the focus is on interaction.”*

Parallel to the horizontal governance and social models promoted in ecovillages, the digital age has led to the same explosion of the figure of the author in all creative fields. These are no longer isolated stars, but a constellation of collaborations, recycling previous projects, concepts, and techniques like a bric-à-brac construction.

To put the conclusions of this reflection on authorship and users into perspective, the experience of the Italian collective Global Tools (1973-1975), which emerged from the radical Italian design movement, shows that the ethics identified and the ways of applying them to digital practice are nothing new. Even if the ecological urgency was not similar in 1973, the socio-political context or obviously the importance of technology; the conclusions of this aborted avant-garde collective led, as Nathalie Bruyère demonstrates in the book *Global Tools-Éco-Design: Deproject & Low-Tech* to a devaluation of design by equating it with the term «survival». But they also establish the need to convert our relationship with “poor” technology into a “simple technology”, as Bruyère continues: *“The mistake of ‘poor techniques’ is to confuse technique with technology, and thus prevent ourselves from understanding that we can have simple technologies with complex ones. The important thing is not that the material or tool is poor, but that its technology is simple, and therefore easily accessible to the user.”*¹⁹

In 1973, in a premature and perhaps vague formulation, the foundations of low-tech culture, eco-design and degrowth were laid. 50 years on, conditions, possibilities and means have changed dramatically. Yet, after the observation of ecovillages and a contemporary reflection on our digital usage, the desired direction is the same, linking author and user in a deconstructed, inclusive approach to technology to serve social and ecological justice.

17. Martin Bressani, Mario Carpo, Reinhold Martin, Antoine Picon et Theodora Vardouli translation by Étienne Gomez, 2019, *Architecture in the digital age, from algorithms to projects*, Multiples

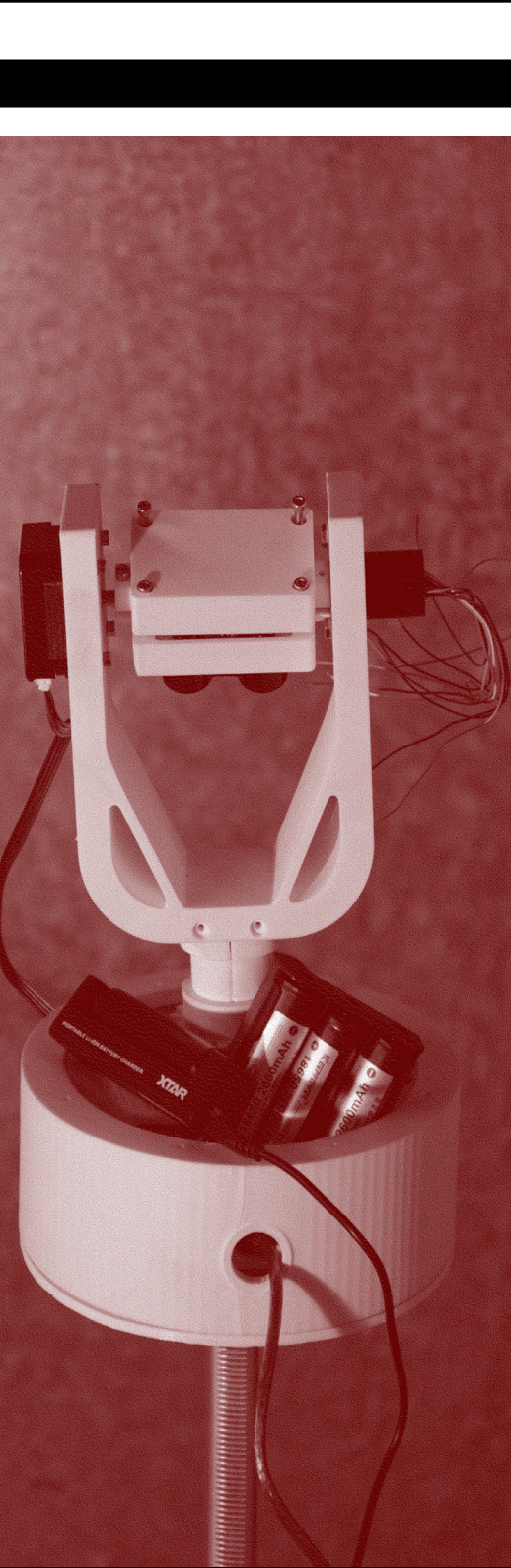
At the start of the second chapter, when presenting the Oasis festival, the eco-residents' debate on the ecological imagination and different narratives was mentioned. Indeed, the primary challenge is to seduce, motivate and make eco-friendly living in an ecovillage desirable. But making ecological sobriety attractive is far from an easy task. Digital architecture, therefore, offers itself as the bearer of the affective narrative of ecovillages. When it comes to the unique or atypical buildings seen in ecovillages, there's a limit to what we can achieve: automation or the norm. Do digital processes serve the purpose of diverse and unique production, or repetition of the existing? For the moment, we're seeing more of the latter with places like De Woongaard. However, computer-assisted manufacture also exists within the theoretical logic of «digital mass-customization», a theory conceptualized by Bernard Cache and Greg Lynn²⁰ which argues that identical and non-identical parts can be mass-produced for the same unit price. Perhaps standardization comes from gestures rather than tools.

18: R.J.C. (Rob) Tönissen, September 2013, The Death of the Architect, University of Wageningen, Netherlands

19: Nathalie Bruyère, Catherine Geel, Victor Petit, March 2023, Global Tools (1973-1975) - Eco-Design: De-project & Low-Tech, Les presses du réel, France.

20. Bernard Cache, Greg Lynn, 2015, Objectile Archaeology of the Digital Canadian Centre for Architecture, Canada.

What emerges from this collage between digital tools, architecture and the echo generated with the two previous chapters is that where ecovillages abolish the divisions between consumption and production (whether for food, water, electricity or housing), the user or author must also be aware of the barriers and abstractions that separate his conception from production. And yet, digital tools can create ambitious perspectives like affect. It is indeed affect, among other things, that can become a precious advantage of ecological discourse. The nuance is therefore in the visualisation of the digital iceberg (servers, networks, software, hosts, virtual projections, algorithms) and in the hacking or glitching of the latter, in the image of ecovillages being glitches in the matrix.





Conclusion

In full The ingenious nobleman Don Quixote of La Mancha, is a novel in two parts written by Miguel de Cervantes. The first part was published in 1605, the second in 1615. Don Quixote tells the story of a gentleman from La Mancha in Spain who goes mad after reading too many novels of chivalry. Thinking himself a knight errant, Don Quixote sets off in search of adventure. The Don Quixote syndrome is a denial of reality taking the form of deciphering reality²¹. The blind man is convinced he is clairvoyant. This illusionary vision is the feeling glued when talking about the ecovillage movement: a disconnected utopia nevertheless shouted by people who have perhaps observed too much the state of the world. This incomprehension and marginality is attached to ecovillages. The act of setting oneself apart from society, either by refusing certain rules or by isolating oneself, is the genesis of these places. Paradoxically, it's on these margins that they seek to forge links. Moreover, Don Quixote didn't become a Knight Errant by chance, or out of some mad desire to change the world through his actions, but out of a love of justice, to bring good everywhere through a sincere spirituality and the boldness that comes with being a good man. He embodies the philosophy of chivalry, a philosophy of self-sacrifice and nobility which, in other forms, can be found in ecovillages with harsh sobriety or an activist struggle that is believed a necessary burden

21: I. Iniesta, 2011, Don Quixote syndrome, Liverpool, United Kingdom

The initial questions motivating this writing were how technique and materialities from ecovillage ethics question our relation to digital production.

The study delves into the political and social scope of the techniques and tools that make ecovillages viable, introducing the book *Low-tech Perspectives* and questioning our relationship to progress and the technological advance on which digital architecture and design in particular are based. For if there is one crucial link in this study, it is the ecology-production pairing that ecovillages are trying to resolve. These dynamics are then articulated with the introduction of the off grid in its radical forms and with the DIY movement that emerges from the ecovillages studied. These two terms then go beyond an apparent binary opposition to digital processes to reveal the connection between them. But through an applied methodology with the Lidar example, the limits of these ethics is expressing the ecological incoherence, exclusive privileges and uncontrollable incapacities of the experience.

Secondly, we described the socio-economic context of ecovillages with my first immersion in the Oasis festival. Very quickly, the questioning of size and number, and the relationship of these places to institutions and the dominant system of production and distribution revealed conflicts: the democratization of this model, the restriction and dependence on the political context, the economic measure. The responses to these conflicts provided by the ecovillages analyses stress the question of ecological urgency and speed.

Finally, these limits directly question the reason for such an insolvent situation, referring to the shift in the position from author to user which is ultimately the theoretical driving force behind ecovillages. A potentiality is drawn in this context through the dependence and overcoming of the architectural field showing how digital technology and ecovillages have exploded the figure of the author. The materialities that make up our environment are produced by the digital revolution and its repercussions. What emerges from ecovillages, however, is an almost conservative but essential criticality towards digital tools. In the end, a bridge is emerging between digital production and ecovillages in terms of the need for affective ecological imagination that digital architecture (between fiction and reality) can enable.

Is this an innovative solution to the ecological emergency of our time? No. But the recognition, through these examples, of the ambiguity in which we are navigating, the recognition of a blur where human and geographical origins are abstract. The recognition that it is illusory to have dreams of escapism, but also the recognition that it is urgent to act, and to act with tools that carry the same values.

“There is no “environmental disaster”. There is a disaster which is the environment.”

The invisible comity, 2007, Extract from *L'insurrection à venir Sixième cercle L'environnement est un défi industriel*, La fabrique éditions, France

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Image Reference:

Page 5: Don Quixote's Battle with the Windmills by Adolf Schrödter 1843, Germany

Site Drawing GPS on architecture



-*'Luminous Earth Grid' by Stuart Williams, 1993,*
Photo: Craig Collins

GPS is a system composed of precise watches orbiting in space around our planet. These watches know where they are in space, keep very fine-grained time, and send information about their position and local time down to earth. If a person can see, in the sky, at least four of these orbital watches, she can use the information from them to understand where she is located. This principle, coupled with a cumulation of satellites and earth stations correcting variables such as atmospheric disturbances, constitutes an increasingly precise system, capable of finding the position of the receiver with centimeter accuracy.

The creation of the GPS relied on many pre-established technologies to exist and its release was a collaboration and a competition between engineers, scientists, politicians and military decision makers.

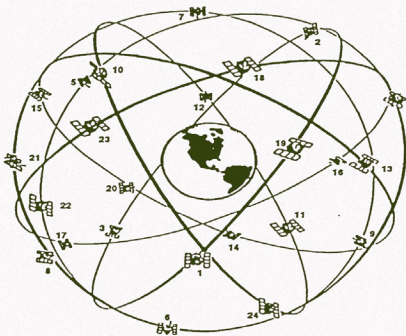


Figure 1-2. GPS Satellite Constellation

-diagram of the GPS satellites orbiting around earth

Some people describe a linear evolution of navigation technologies, moving through the septant, the astrolabe, the compass and finally culminating in our “high-tech” GPS system. This implies that the GPS system was created for similar purposes as the other technologies: finding your way from one point to the other. Even though GPS has become the hegemonic navigation technology, it originally was not meant for you and I to find our way around.

“Like the sorcerer’s apprentice, the military turned on a spigot, which became a gusher that it could not turn off.” - Ceruzzi ¹

Three key moments: in 1978, Navstar I, the first GPS satellite group, was launched. In 1983, President Reagan allowed the use of GPS to commercial traffic, opening for the first time beyond the technoscientific complex associated with US power. In 2000, Clinton removed limitations on location precision for civilian users, exposing the same level of locating power used by the military.

“History progresses at the speed of its weapons systems.” - Virilio ²

Militaries use an operational concept called “combined arms”. Groups with different capabilities, operating on different spatio-temporal rhythms, coordinate their unique skills to achieve their goals. It sounds simple, but layered and compartmentalized command, control, and communication networks make the logistics of an operation very complex.

The idea of GPS was seen as a promising tool. Commanders could now imagine the possibility of a “magic map,” showing the different soldiers and weapons. Long range weapons might have higher confidence that they would not accidentally harm friendly groups. GPS technology was the latest military technique to enable coordinated action, offering the ability to precisely locate entities on a global grid.

After years of development, GPS receivers were deployed during US hostilities in retaliation for the Iraqi invasion of Kuwait . According to Lt. Gen. Frederick Franks, the Commander who oversaw the largest segment of involved US forces: «*They (GPS) were invaluable in avoiding fratricide and allowing accurate navigation and artillery fires.*»³

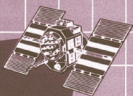
But the military wanted to do more than just see people on a map. Because GPS receivers faithfully report their location, the military realized that strapping a navigation computer (with GPS) and some directional guidance (fins) on a big bomb is the cheapest way to shred people with shrapnel.

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2. Virilio, Paul, and Mark Polizzotti. 2006. Speed and Politics : An Essay on Dromology. Los Angeles, Ca: Semiotext(E).

3. Dissinger, Kaleb. 2008. “GPS Goes to War - the Global Positioning System in Operation Desert Storm.” [Www.army.mil](http://www.army.mil). February 14, 2008.

Product Information Sheet



MANPACK/VEHICULAR CONFIGURATION

The Collins Manpack/Vehicular (M/V) GPS User Equipment (UE) will enhance the navigation and weapons capabilities for foot soldiers and land vehicles. The Collins system will provide precise 3-dimensional position (P) and velocity (V) as well as coordinated universal time (T) for support of ground-based missions such as tactical reconnaissance, artillery forward observer, ground-based forward air observer, and survey. In addition, the Collins M/V GPS UE will enable precision navigation, coordinated amphibious operations and mechanized maneuvers.

GPS
Global Positioning
System

-Cover of the manpack original brochure by Rockwell



-1990-1991, Persian Gulf, known as Operation Desert Shield/Desert Storm

At the time we are writing this article, for example Israel uses bombs on Gaza, the West Bank and Beirut which have a conversion kit (generally JDAM or Spice) that allows GPS targeting of places to explode.

So, beyond navigating space, GPS helps enable the massive destruction of spaces. But what does it mean to rework a technology designed to map hostile territory (“outside”) as a space for the application of violence, for use in the civilizational space of our cities (“inside”)?

Traditional architecture confined itself to places of life, but in the digital anthropocene era, we use the same core tools and expertise to design a parking lot, a hospital or a 10 floor residential building.

“The new architecture of the digital age is not what we can do with digital tools, but what we cannot do without them.” 4

For a 5G antenna, an industrial port like Rotterdam, the Chatelet les Halles shopping center in Paris, or a large dairy farm, the knowledge of our positioning in the geometric system acts as a Brattonian platform: the GPS not only enables the existence of these spaces, in turn these spaces feed the cultural and economic power of the GPS project.

“Platforms are generative mechanisms—engines that set the terms of participation according to fixed protocols (e.g., technical, discursive, formal protocols). They gain size and strength by mediating unplanned and perhaps even unplannable interactions.” 5

First, a platform creates a template or an “armature” which obliges objects to conform to it. A standardization makes information exchange possible, but also implies a marginalization of certain objects that can’t be coerced to fit the standard. In the sense of objects marginalized by GPS we can list all plants and animals not “static” or “physical” enough to be taken in account by the abstraction of the map but also informal human practices and undeclared businesses or exchanges.

GPS is a platform that represents the bearer of a GPS receiver into coordinates.

GPS is a platform that transports a point of view from an embodied perspective to an abstract, formal vision.

GPS platform that transports a localisation (a place) into abstraction (a simulation).

As we presented earlier the military origins and still to this day application of the GPS system, we see that this “machine” is embedded within a political program. Like many digital technologies, its neutrality is taken for granted, its ethical and theoretical problems are erased and its use is presented as natural.

We will first look at the terminology and the arguments of why GPS can be seen as a platform, then we will focus on two effects of this technology: fluxes and collections. Finally we will open the reflection to the macroscale and the paradoxical abstraction it is causing to land on an open-question of subversion and its necessity.

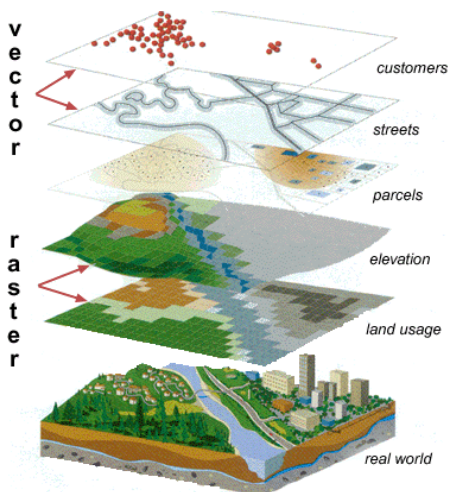
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Fluxes

The GPS society is one in which it makes sense to represent a person, or a vehicle, food, or construction capacity as a vector of location coordinates. But the world eludes description, and as a result the vectors are the subjects of patchy transforms to recover human understanding.

GPS, as a tool for tracking the movement of fluxes and flows, has become a fully integrated feature of our time. However, the land, air, space, time, and the flora and fauna that constitute our life world largely resist (are marginalized) complete description and digital representation. While GPS is effective in generating vectors, it does not capture the taste and smell of the world.

The superposition of GPS technology with the GIS (Geographic Information System) data system to model the topology of the Earth using geodesic coordinates: latitude, longitude, elevation has allowed the management and «understanding» of a place remotely.



-Geographical Information System (GIS) scheme

GIS coupled with satellite imagery has made Earth into a virtual world, allowing users to scroll or zoom or pin “real” places.

In addition, the use of GPS systems at a macroscopic scale allowed the collection and creation of statistics. These statistics, frequencies, periods and positioning can then be used to anticipate, predict and monitor. The insights from this monitoring become part of the decision to create different infrastructures. For example, GPS tracks of car traffic can inform when and where to build new roads. But the most interesting information comes from the massive adoption and individual use of GPS, especially with smartphones. GPS tracking has made it possible to visualize the crowds as particles of water, which themselves can dictate the shapes to be built.

Since the 1980s, when GPS was invented, the world has changed in many ways to rely increasingly on vectors of data and machine instructions. Energy (petrochemicals and electricity), raw construction materials, and other commodities have changed from long-term contracts to real-time spot markets, where the price changes from moment to moment as algorithms match vectors of buyers and sellers. Cities are agglomerations of people and buildings, but in modern society they are also a dense fabric of “assets.” In global capitalism, everything has a value, and that value must be recorded as an entry on the ledger of an entity who claims it. One of the main things that has shaped the city literally is the way that we move resources around it. The people need food, household goods, and leisure items. Those goods are assets, and the vehicles that move them around are also assets. Beyond that, the time that it takes to move goods around is also an asset, and is valued proportional to the cost of paying people to drive around.

GPS technology allows all of those assets to be tracked in real time. Trucks carrying food, bicycles, or baby clothes are all able to be spatially located with granular precision. Just like the military originally intended to use GPS to locate the positions of soldiers on a battlefield, businesses can locate the entities that they care about and use this information to make decisions.

But all of these vectors have to be patched together and made to serve the interests of the people who use the technology. For example, sometimes our computational description of reality loses touch with reality. Indeed, many vectors that people assume are exchanged between machines are touched and manipulated by anonymous actors in the middle, cleaning them and preparing for each next machine to understand them.

Observe that the land on the surface of the earth is constantly moving, as continents float around on the surface of the earth, changing about 2-20cm per year. But the maps we use have a really hard time dealing with this. So each continent or country creates a fixed map that doesn't move relative to the territory that it covers, but over time diverges with global reference systems.

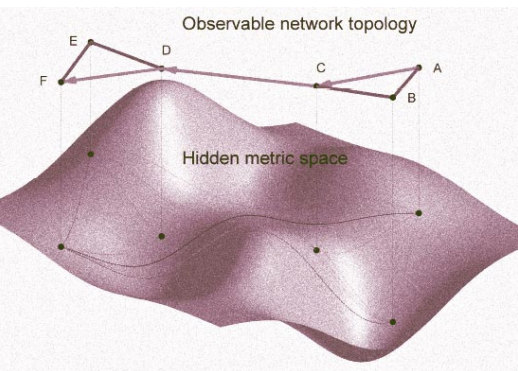
In Europe, this convenient, stationary map is called the European Terrestrial Reference System 1989 (ETRS89).. an ECEF (Earth-Centered, Earth-Fixed) geodetic Cartesian reference frame, in which the Eurasian Plate as a whole is static.

But the convenience comes at a cost:

“At some point in the future, the drift of the Eurasian tectonic plate (~25mm/year) relative to WGS84 plus the improved accuracy of stand-alone GPS positioning from even simple “consumer level” receivers will mean the offset between ETRS89 and WGS84 becomes apparent to a much wider group of users, even on small scale mapping.”⁶

6. “A Guide to Coordinate Systems in Great Britain.” 2020.

To fix this, invisible institutions maintain an ever changing transformation between coordinate systems: a recipe to patch world maps together. This example illustrates an important concept for our work: the idea of a hidden metric space that is obscured by the simplifications required for computational tools. For example, a map of connection between points ABCDEF made of equally weighted straight paths between point locations may obscure the rough terrain in between. If the hidden metric space was revealed the lengths between points would increase to reflect the path over hills and valleys.



In architecture too, vectors of points become surfaces and solids that define the CAD models that are used as the basis for modern architectural practice. The computer's calculation becomes agent, the software's toolboxes become horizons, from Zaha Hadid's forms (modern reference of an architectural signature where the forms often curvilinear, uncluttered and organic are the result of algorithmic and nodal processes and digital engineering) to BIM technology, what form promotes is its own ability. This architecture exists, in some sense, because we have the necessary computing machines to design it. What is intriguing, then, is the shift from a means of production to a means of reproduction: computers themselves are a product of their own technological capacity and architecture becomes -more or less- an advertisement of these technical capacities.

Theodora Vardoulli in 'Architecture in the Digital Age' clearly expresses the new symbols that had taken a dominant position in architecture by end of the 1990s:

"They (architectural projects) exist both as forms, as structures, and as a process. Their appearance as perceptible to the senses (form) is controlled by an underlying topological description (structure) itself updated through computer computation (progressive process).» 7

This change gives rise to the trend of 'copy paste' in private construction, especially in real estate projects where mass producing the same designs leads to cost savings through economies of scale. This phenomenon can be seen in suburban neighborhoods of single family houses, in offices with globalized layouts of working spaces, in architectural elements reused because of their compliance with international or national norms such as doorways, windows, stair rails, parking lots, etc.



-airport simulation of pedestrian traffic

7. Bressani, Martin, Mario Carpo, Reinhold Martin, Antoine Picon, and Theodora Vardoulli. 2019. "L'architecture à l'Heure Du Numérique, Des Algorithmes Au Projet."

Collection

Archiving and collecting creates the possibility of simulation. Simulation is in computer-age architecture; the overriding condition. Simulation allows us to test, project, build validity on the basis of the digital model.

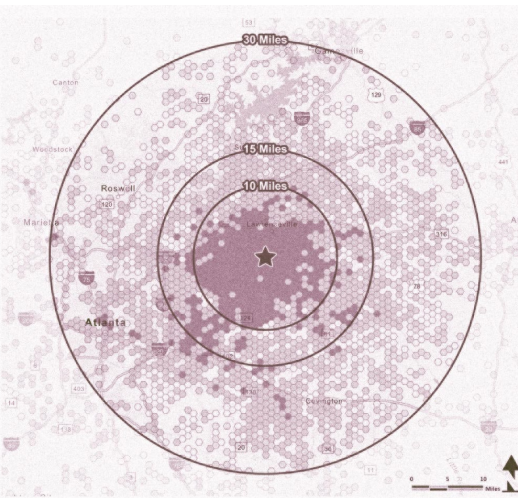
The widespread availability of inexpensive GPS chips allows private companies to track the movement of groups with ease, enabling them to generate detailed maps that assign value to urban areas. These data-driven maps shape and define the underlying conditions that make the modern city possible, influencing everything from real estate and infrastructure to commerce and urban planning. In this way, GPS technology becomes a powerful tool for commercial entities to shape the city's physical and economic landscape, determining how space is organized, valued, and utilized.

Anonymised GPS data, bought from data vendors who take the data from applications on your phone, can help large real estate developers understand the profit making potential of an area/neighborhood. If the people who drive there come from areas that make money, your shopping center can also make money.

We can therefore make the following shortcut: the GPS system is an important technology in the "commercialization" (life experience pushing to consumption and repetition/normalization of our leisure time and cultural places) of our urban spaces.

*"As I read the street map on my smartphone, the map also read me."*⁸

. Bray, Hiawatha. 2014. You Are Here. Basic Books.



-map showing device home location density for visitors to an example shopping center in 2021

Our usage of GPS enabled tools becomes a form of unpaid labor or involuntary collaboration—the more we interact, the more we enhance the apps and improve the precision of the data, a clear case of a Brattonian platform.. For example, in this patent, Google, one of the biggest platform companies of our age, explains how they use anonymised GPS location of multiple cars to create a score of the current traffic conditions. Those inferred traffic conditions feedback, improving the routing algorithm of the Google Maps directions.



HOW TO USE

GOOGLE MAPS

TO PLAN A TRIP



-google maps youtube tutorial for tourism

Macro and abstraction

It goes without saying that the GPS system, its thinkers and its activity are heirs to the mechanistic thought established by Descartes, Hobbes and other intellectuals of the 15-16 century. The vision of the world as mechanical, mathematical and inanimate allowed the moral acceptance of its dissection and exploitation that founded modern science. In 1370, Oresme compared God to a watchmaker and now, we have around the earth quantum clocks orbiting, giving everyone a synoptic view of the planet. The GPS system was born out of the globe, dominating it spatially by wrapping itself around it. It is global by nature and fragile in this condition: without 24 satellites running simultaneously, it becomes obsolete. These satellites are maintained by a network of ground command and control stations that synchronize the satellites timing and trajectory.

“The evolution of technical systems moves toward the complexity and progressive solidarity of the combined elements. «The internal connections that assure the life of these technical systems are more and more numerous as we advance in time, as techniques become more and more complex.» This globalization [mondialisation] of such dependencies—their universalization and, in this sense, the deterritorialization of technics—leads to what Heidegger calls Gestell: planetary industrial technics—the systematic and global exploitation of resources, which implies a worldwide economic, political, cultural, social, and military interdependence.”
- Stiegler, *Technics and Time 9*

Arguably, our society achieved a level of all-seeing eye view when we first experimented with photos taken by airplanes or imaging satellites. But the image from above is sterile and constrained by the movement of the camera. GPS allows the god's eye to reach out and touch something, mark it, follow it across time.

The GPS system and the microscope are not so far apart: like the microscope that allows a clear and sharp top view on the cell studied, the GPS provides this vision on ourselves.

The story of the creation and expansion of GPS technology is the same story as the evolution of society during the same time period. Technology is bound up completely in the context of its creation, and the constraints of the prior technical systems which it relies upon for its creation. In some ways, GPS is a natural “evolution” of the map, the survey, and the techniques for measuring our relation to the surface of the spheroid that we live on. But it also is a specific object and system, and its traits inherit from the milieu that created it. Being created for military use, by military scientists, engineers, and war planners, means that GPS, as we have shown earlier, is a technology for command and control that acts by the production of vectors of location and movement. Our society has a desperate thirst for the information inputs to command and control decisions. For example modern business practice borrows the metaphors of war to strategically invest capital into opportunities for its growth. We argue that GPS society seeks for a deity status, by enabling embedded computational systems to learn and communicate their place on the global map. Architecture also aspires to the position of a God, creating a habitat for people in a process mirroring the mythical creation of Earth itself as a home for humans. Providing a world for the inhabitants, and anticipating their needs, building the conditions of possibility for their existence from the position of authority.

For example; the architectural projects of utopian cities is not a recent phenomenon, from the utopians of the Enlightenment to the megaprojects of the Soviet regime through our famous Corbusier, the extension of a single vision to the territory of an entire city has nothing new. But we can argue that their realization is now increasingly practiced with the modern «big projects» as King's Cross in London or La Défense in Paris or Hafencity in Hamburg (or Dubai, or Shenzhen, or Beijing, or Honk Kong, etc etc) which are urban planning and architecture projects at a macro scale in which a total vision is carried out to create centrality, a singularity and cost-effective infrastructure for the future of the city.

These mega-projects will often provide overlays of uses: housing, transport, shops and offices and we had seen before how our geo-data are representative of our habits and sold to create thematic maps. On the one hand; the tracking via GPS creates a database closer to reality to plan these mega-projects, however, urbanism and architecture do not have a speed of adaptation/ change as fast as the uses and habits of citizens. In this context, the critics are turning to a recommendation for a flexible architectural programme without too many predefined uses.

Unfortunately, these mega projects from history often end in failure. Why? Often the scope of their ambition leads to oversights that generate alienation and discomfort for the residents.

Again, we are faced with a vision derived from mapping and a hidden metric space. Previously, we imagined the hidden data to be the rough, organic shape of terrain features obscured by the idealized global geoid.



-aerial view of Bijlmer, an Amsterdam neighborhood

But here, we are interested in the space of human experience - the same elements of our experience obscured by the utopian vision of mega-project planners. GPS and contemporary computational architecture/urbanism share the backbone of the “planetary industrial techniques” and by this genealogy, they inherit the hidden space of human experience (informal human practices and undeclared businesses or exchange) that the command and control society overlooks.

In the end, GPS tracks are only mathematical relationships between the extracted location and the authority of the map grid. There are no tracks to follow through the snow or mud.

We believe that this is forgotten by the vision of the smart urban paradise, enabled by computational architecture and planning, optimized and informed by real time data from systems like GPS, expanding throughout the globe in evolving replication across a computationally defined grid.

The transformations of the technical system regularly bring in their wake upheavals of the social system, which can completely destabilize it when «the new technical system leads to the substitution of a dominant activity for an out-dated activity of a totally different nature» (Gille 1978, 26). - Stiegler 10



-Google map glitch of 3D view when introduced in 2005

10. Stiegler, Bernard. 1998. *Technics and Time 1: The Fault of Epimetheus*. Stanford, Ca. Stanford Univ. Press.

Outro

Starting from its agency as a method of destruction, and continuing in its operation as a platform. Standardizing and rejecting (marginalizing) certain aspects of the real, and passing through inquisitive drifts in our habits and our uses. It has technical uses in computational architecture, transport and agriculture industries, and abstract influences and biases on our way of seeing and making the world. We have seen that GPS technology exerts an influence over architecture and our environments. The shape and span of this influence is not bounded by well-defined contours, but its shadow is clearly visible and growing. Our observations have demonstrated the stealthy nature of this influence, perhaps due to the extraterrestrial position that challenges us on the credibility to question it.

However, like most systems that claim the authority to represent (and consequently to hide), its structure offers glitches, games, and hacks. For example, Simon Weckert uses the Google patent mentioned earlier to create fake traffic jams by creating a simulated reality of many GPS users in one place at the same time. We believe it is necessary to subvert this platform in order to reveal its biases and its deviations and to explore new uses of it.



-Work of Simon Weckert where he creates a digital "traffic jam" using a 100 smartphones

It is also interesting to consider the GPS system as low-tech because it is part of the real, and maintained by a public and private network and because its access is now open to all for affordable prices.

In order to give GPS more visibility, to discuss false neutrality, and to play with notions of practicality, we decided to work on our project: Site Drawing. This is not a hack or jam, but rather an unexpected tool using GPS as the basis.

Site Drawing is a new methodology for spatial design. The practice is based on a GPS receiver fixed to a telescopic stick tracking the movement of the participant within a site. Like a pen on a paper, the movements are recorded in 3 dimensions to be able to design the spatial project with centimeter accuracy.

Digital design is based solely on a simulation created by satellite views, cadastral plans or other data extraction. By performing the design in situ, the model is accurate and site specific, canceling the need for a simulation. The participant, the weather, the amount of satellites received, the site specificity and the aim of the drawing are all components manifested within the drawing.

Using GPS for in-situ architecture in locality-centered communities engages in a double subversion. First, it subverts the extra-planetary scale of GNSS by using a system designed for synoptic vision to create artifacts that are only legible relative to the context they are created in. Second, it subverts the destructive origins of satellite navigation - marking locations for precision guided weaponry - by using the technology to create imagined futures, rather than destroy the existing one.

What we encourage is to go beyond the mechanical use of GPS to using it as a tool capable of translating a sensitivity and an identity to produce unformatted small scaled objects.

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