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# Friction *Fiction*

Stéphanie Gygax

## *The drift*

I have never owned a car.  
I have no nostalgia for the beat writers  
Or have I?  
I long for  
Crisp glimmering air  
Crystal clear atmosphere  
A monophonic bumblebee  
Softly humming  
In tune with the gleaming sun.  
But all at once  
Paradoxically  
I love driving.

As far back as I can remember, I have always wanted to be able to drive. My driving license was obtained like a long-awaited passport for freedom and independence, enabling me to leave as often as possible a family house situated in the country side.

The car is a vehicle that I examine regularly in my work, without having any yearning or particular attachment for the object itself as a consumer product. Why is this disturbing machine so meaningful for my imagination? What is it that is haunting me in the shape of a car? The desire of looking into an object that is at the same time overly present and threatening, that can be seen either as a symbol of social success or as a fatal entrapment is already the outline of an answer<sup>1</sup>. But there is one component that is more personal and that I feel is determining: it is the sense of drift one experiences in the car. Namely, the altered state of consciousness occurring during a long ride, similar to the effect of meditation or hypnosis. This mental state, in which the mind is



[Fig.1] Joan Didion smoking in her Corvette Stingray, 1974.  
► P. 25

aware but is not in its usual wakeful condition, just like before falling asleep, offers the intellect a rest and allows oneself to observe one's (outer and inner) world from a different perspective.

In her book *The White Album*, first published in 1979 and considered as a classic of New Journalism, Joan Didion – a frail-looking woman famously driving a fancy yellow sports car – illustrates California in the wake of the intense and chaotic period of the 1960s with a mosaic style that seems to follow no precise narrative. She does write in a kind of alluvial flux that evokes a drift, but moreover she specifically describes the act of driving as a numb exhilaration where time seems to flow in slow motion:

*Mere driving on the freeway is in no way the same as participating in it. Anyone can "drive" on the freeway, and many people with no vocation for it do, hesitating here and resisting there, losing the rhythm of the lane change, thinking about where they came from and where they are going. Actual participants think only about where they are. Actual participation requires a total surrender, a concentration so intense as to seem a kind of narcosis, a rapture-of-the-free-way. The mind goes clean. The rhythm takes over. A distortion of time occurs, the same distortion that characterizes the instant before an accident.<sup>2</sup>*

Indeed, rhythm and surrender might be the basis of the sense of drift that I am addressing. It is close to a half-dream state, yet with a vivid focus shifted toward subtle bodily sensations, which provokes a variable perception of time and space.

A founding experience of my early teenage years is the one of sitting on the backseat of our family car on the way to the French Riviera, listening to the

sound of carefully selected mixtapes of shoegaze music in my headphones while watching the landscape scrolling through the window, moving from whatever place to whatever another, as if I was being carried by a powerful and thick current. I could feel my body drifting and it pleasantly produced the effect of a light drug on my struggling mind. I could perceive the rotation of the tires, their friction on the asphalt, like a continuous and rhythmic lulling sway, as if they were an extension of my body.

Tires rolling on a smooth carpet made of tar, two black objects producing white noise and connecting me to the surface of the Earth, glide guitar melting into the environment as well as into my eardrums – this might not only be my condensed experience of the early 1990s, but also the roots of my fondness for the drift.

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1 "Cars fudge any residual distinctions between material and semiotic, base and superstructure, by defying the assumed fixity which gave that powerful spatial metaphor its initial analytical grip. (...) Analyzing it demands that we modify our understanding of consumer society and its working, so that our analysis can encompass the alienated but nonetheless popular pleasures of auto-freedom (mobility, power, speed) while appreciating their conspicuous interpersonal, civic, environmental, and geo-political costs." Paul Gilroy, *Darker Than Blue*, 2010, p.30

2 Joan Didion, *The White Album*, 1979, p.83

# *Debord accelerated*

Lost children  
At the crossroads  
Waiting for an empty moment.

The image-dust

Slips away

I deliberately use the word drift instead of the French one “*dérive*”, even if both terms usually describe the sensation of moving in response to external forces, of letting oneself be carried away, or in a broader sense, a tendency to be diverted from a straightforward agency. The weight of the French word, because of its charged history in the arts, makes it rather inappropriate for naming the kind of drift I mentioned, although (or because) I have much affection for Guy Debord<sup>3</sup>. It is then useful to quickly examine this history in order to clarify the differences that I would like to stress between “*dérive*” and drift.

The artistic term “*dérive*” finds its roots in the 19th century literary character of the “*flâneur*” – a modern, urban, privileged, uniformly male idler wandering through the Parisian arcades, a dandy largely described by Charles Baudelaire. This figure was later pinned by Walter Benjamin as an archetypal model, a detached observer of the damages of capitalism who, despite his refusal of acting productively, was a leisured and passive consumer tending to self-loss and alienation<sup>4</sup>. In the 20th century, the surrealists revisited the “*flâneur*” figure, moving its gaze away from the shop windows and directing it “elsewhere”, liberating it from mere consumption and from moral values, yet neither from fetishization nor from a relative passiveness. Through these strolls using the dream and randomness as a poetic programme, the surrealists wanted to produce images that would create a shock against the bourgeois society and its established art (however, in Debord’s opinion, they have above all created their own myth).

The situationists were very critical toward the surrealists, despite the fact that the two avant-garde



[Fig.2] Barricade of overturned cars in rue Gay-Lussac, Paris, May 1968.  
► P. 26

movements can be seen as very close to each other. Unpredictable deambulations were used by the situationists as well, who named and systematized the "dérive": its pace was the one of a walk, usually taking small groups of people into an urban landscape. The situationists were more active than their predecessors by meticulously triggering new experiences. With them, experience replaced the image and drunkenness often replaced the dream, for the situationists loved alcohol – de facto, the "dérive" always seems to be accompanied by a mind-altering element.<sup>5</sup>

The drift discussed here shares some similar components, albeit too partially to be seen as the direct and contemporary offspring of the situationist "dérive". The drift's pace is faster for sure, it has a more solitary feature since the protagonist (by no way exclusively male or exclusively white like the "flâneur" used to be) is connected to machines rather than to other human beings.<sup>6</sup> The concerned territory is much larger, not limited to the city: in fact, it is less related to the perception of a specific place than to a general sense of spacetime distortion. If one thinks of Debord's psychogeographic maps, the "dérive" is built by a succession of fragments and sequences involving sharp ruptures. The drift I am referring to also alters the feeling of Euclidean linearity, but in another way: it rather happens through a rhythmic flux, a rippled flow that tends to warp space and time over themselves.



[Fig.3] Stills from Guy Debord's film "Critique de la séparation", 1961. ► p. 27

## Grip and glide

Road contact  
Road roughness  
Inflation pressure  
Rigid bodies  
Elastic limit  
Stress and strain curve  
Boundary conditions  
Fluid film  
Trapped fluid  
Deisolation gaps  
Energy dissipation  
Temperature distribution  
Velocity magnitude  
Fluid in the groove  
Of a roundness.  
Where will we meet?

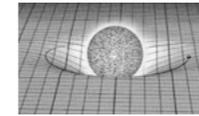
Contact zone

Contact zone

Contact zone

Contact zone

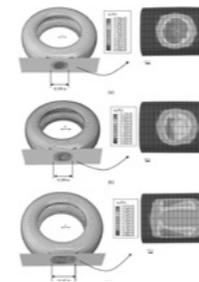
3 A French writer, filmmaker and cultural revolutionary, founding member of the avant-garde Situationist International collective and author of the *Theory of the Dérive*  
4 Richard Pope, *The Jouissance of the Flâneur: Rewriting Baudelaire and Modernity*, pp. 4–16  
5 Alexandre Trudel, *Des surréalistes aux situationnistes*, p.3  
6 Guy Debord, *Théorie de la dérive*, 1956



[Fig.4] A visual representation of spacetime: a star warping space, as a dense ball would warp a rubber sheet.  
► P. 29

Intuitively, spacetime curvature can be linked to the tires – unostentatious rounded elements of the vehicle that bind the passenger to the road bed, and that can be considered here as an object evoking general relativity due to the gravity which occurs on (or through) their elastic rubber. Indeed, the analogy of a rubber sheet is often called upon to visualize curved spacetime.<sup>7</sup>

Created by the Earth's gravity, the contact zone between the rubber of the tires and the asphalt of the road builds a patch, a very small and precise surface through which a great deal of powerful dynamic forces come into play and interact. From an artistic perspective, this contact zone – where friction meets traction and rolling resistance – embodies a gateway for various fictions or artistic works.



[Fig.5] Normal contact pressure distribution in the contact patch area, *International Journal of Pavement Engineering*, 2018.  
► P. 28

Road movies are narratives relating to the meeting of the energies of velocity and inertia, like in a great kinetic feast. Among them, New Hollywood films from the early 1970s often carry an abstract and metaphysical feature, using a minimal plot that serves to describe the mental quest pursued by the characters, rather than their actual journey. *Five Easy Pieces* (Bob Rafelson, 1970), *Two-lane Blacktop* (Monte Hellman, 1971), *Vanishing Point* (Richard C. Sarafian, 1971), or *Badlands* (Terence Malick, 1973) present the road movie as a postmodernist genre using the journey as cultural critique, showing visually stunning drifts through an almost nihilist spiritual angst.<sup>8</sup> One of the most stripped-down examples is *Vanishing Point*, connecting identity crisis, transgression and liberation to motion while ironically maintaining a rather patriarchal view toward counterculture, race and sexuality. Its relevance here comes from the unusual structure of its sce-

nario, inspired by Carl Jacobi's elliptic functions and constructed on the model of a Moebius strip, using the loop as a central element.<sup>9</sup> Interestingly, Jean Baudrillard also titles a chapter *Vanishing Point* in his essay *Amérique* first published in 1986, which portrays "a sideral America, that of the vain and idle freedom of the freeways". Although Baudrillard never directly mentions the motion picture, what he writes seems to comment the film perfectly, describing how human perceptions can be affected by a long car ride:

*Rouler crée une sorte d'invisibilité, de transparence, de transversalité des choses par le vide. C'est une sorte de suicide au ralenti, par l'exténuation de formes, forme délectable de leur disparition. (...) Il y a un événement, ou une innervation, spécial à ce genre de voyage, et donc un type spécial de fatigue. Comme une fibrillation de muscles striés par l'excès de chaleur et de vitesse, par l'excès de choses vues, lues, traversées, oubliées. La défibrillation du corps excédé de signes vides, de gestes fonctionnels, de brillante aveugle du ciel et de distances somnanbuliques, est très lente. (...) Ainsi est atteint le point centrifuge, excentrique, où circuler produit le vide qui vous absorbe.*<sup>10</sup>

The movie's original poster shows a muscle car in the center of a round black patch, suggesting a tire (or a future Baudrillardian centrifugal point) surrounded by an accumulation of orange figures spinning counterclockwise. A black hole swallows the excess of "things seen, read, gone through, forgotten", during a trip that refers to a mental and psychedelic experience as much as the actual trip on the road.

Centrifugal force is a fictitious force caused by inertia.<sup>11</sup> It is typically perceived by passengers of a car that is driving round a curve, experiencing a tendency to be pushed away from the centre of rotation.



[Fig.6] *Vanishing Point* begins with its ending in an opening freeze-frame showing the white Dodge Challenger dissolving in a time loop.  
► P. 30

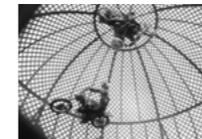


[Fig.7] *Vanishing Point*'s original poster, 1971.  
► P. 31

Hence, rotation is sought in order to create artificial gravity on many occasions, and can be observed in various formally compelling examples.

In this idea, experiencing artificial gravity by propelling one's own body on elliptical surfaces leads to a radical and integrated exploration of abstract notions of physics. People who practise skateboarding surely have a particular relationship with space, surfaces and the laws of motion, as they are ideally placed to push the limits of artificial gravity within their flesh.

Raphaël Zarka is a French artist working mostly with sculpture, he is a writer and a skateboarder as well and his unexpected approach of form, influenced by these different activities, is very interesting for my purpose. In his book *Free Ride: Skateboard, mécanique galiléenne et formes simples*, Zarka explores the history of the loop and draws parallels between full-pipes (with the possibility to skate inside them in a complete loop), science-fiction orbital vessels in the form of a wheel (using rotation in order to create artificial gravity) and stunt shows such as *The Globe of Death* (starring motocross riders spinning inside a steel cage).<sup>12</sup>



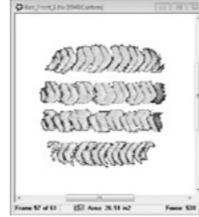
[Fig.8] *The Globe of Death* (also known as the *Sphere of Fear*) is a classic animation during motorcycle gatherings.  
► P. 32

Bended surfaces, when skated, driven or followed, can vividly evoke the "smooth space" as defined by Deleuze and Guattari in *Mille Plateaux*. A "space of contact" that can be explored only by "strolling over it":

*Mais on remarquera que les plus simples considérations de vitesse font déjà intervenir la différence entre la chute verticale et le mouvement curviligne, ou plus généralement entre la droite et la courbe, sous les espèces différentielles du clinamen ou du plus petit écart, le minimum de surcroît. L'espace lisse*

est justement celui du plus petit écart : aussi n'a-t-il d'homogénéité qu'entre points infiniment voisins, et le raccordement des voisinages se fait indépendamment de toute voie déterminée. C'est un espace de contact, de petites actions de contact, tactile ou manuel, plutôt que visuel comme était l'espace strié d'Euclide. L'espace lisse est un champ sans conduits ni canaux. Un champ, un espace lisse hétérogène, épouse un type très particulier de multiplicités : les multiplicités non métriques, acentrées rhizomatiques, qui occupent l'espace sans le « compter », et qu'on ne peut « explorer qu'en cheminant sur elles ».<sup>13</sup>

Similarly, the play with analogies guided by intuition is a tool, a method that I like to use in my work. It can be delicate, but it usually leads to surprising connections that go beyond conscious thinking patterns and proves to be fruitful on many occasions. Through sensory associations and reflexions triggered by Zarka's research, it becomes clear that gravity is an element which strongly influences the sense of drift.



[Fig.9] Tire footprint pressure output during a dynamic roll test.  
► P. 28

7 "The analogy begins by considering space-time as a rubber sheet that can be deformed. In any region distant from massive cosmic objects such as stars, space-time is uncurved—that is, the rubber sheet is absolutely flat. If one were to probe space-time in that region by sending out a ray of light or a test body, both the ray and the body would travel in perfectly straight lines, like a child's marble rolling across the rubber sheet.

However, the presence of a massive body curves space-time, as if a bowling ball were placed on the rubber sheet to create a cuplike depression. In the analogy, a marble placed near the depression rolls down the slope toward the bowling ball as if pulled by a force. In addition, if the marble is given a sideways push, it will describe an orbit around the bowling ball, as if a steady pull toward the ball is swinging the marble into a closed path." *Relativity*, Sidney Perkowitz, Encyclopedia Britannica

8 Read more about these movies in a chapter called *Drifting on Empty* by David Laderman in his study *Driving Visions: Exploring the Road Movie*, pp. 82-86

9 See Richard C. Sarafian's interview in Bernard Benoliel & Jean-Baptiste Thoret's book *Road movie, USA*, p. 165

10 Jean Baudrillard, *Amérique*, pp. 25-26

11 *Centrifugal force*, Encyclopedia Britannica

12 Raphaël Zarka, *Free Ride: Skateboard, mécanique galiléenne et formes simples*, pp. 50-58

13 Deleuze & Guattari, *Mille Plateaux*, p. 459

## A space odyssey

The shape of a tire is like a smooth loop  
A circle with variable volume  
A ring laid on my tongue  
A vortex ring  
A swim ring  
An O-ring  
A lifebuoy  
A hoop  
A bagel  
A donut  
An inner tube  
An inflated inner tube  
A giant inflated inner tube  
Floating in space like a ring of gas and dust

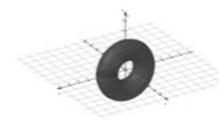
In geometry, the torus describes a surface of revolution obtained by rotating a circle in three-dimensional space around an axis placed on the same plane as the circle.

One of the real-world objects that is the most frequently used to describe how a torus is mathematically constructed is the inner tube. As it is made out of elastic and stretchable rubber, it can be pumped up in order to change its volume, so one can more easily understand how it behaves on an  $xy$  plane.

The torus is a surface whose revolution is defined in a way similar to that of a celestial body revolving on an orbit or an elliptical trajectory. Here the word space can be understood simultaneously in a mathematical, geometrical sense or in an astronomical one. Interestingly, various NASA experiments on space stations were based on the torus shape and involved a tire and rubber company.

In the early 1960s, NASA teamed up with Goodyear Aircraft Corporation to work on a pristine, visually stunning 7-meter inflatable station concept for test use, in preparation of a lunar mission and an orbital laboratory. It was built with nylon cord and butyl elastomer (synthetic rubber) in order to fold into a life container and to host an up to 6-person crew with regenerative life support system. Its shape was designed in order to simulate gravity through rotation.

Various models of the *Erectable Torus Manned Space Laboratory* went into production, were tested and displayed as full-scale research models, but none were ever flown. In the end, because of the high dangers of a meteoroid shower on a large rubberized surface and due to the dynamics of the soft toroidal structure that made the station slightly



[Fig.10] A torus with radii  $R$  and  $r$  is the surface obtained by rotating a circle of radius  $r$  centered at  $(R,0)$  about the  $y$ -axis.  
► P. 34



[Fig.11] Toroid inflatable station concept during testing, 1961.  
► P. 35

oscillate when the astronauts were working – disrupting its carefully planned orbit – NASA realized that it had to be made out of a more rigid material.<sup>14</sup> Therefore, the rubber was abandoned for space station projects, but this did not mark the end of NASA's collaboration with Goodyear, nor that of their investigations on the torus structure: the tire company supplied essential equipment for the Apollo 11 mission, such as brakes or window frames. In the mid-2000s, Goodyear developed the so-called Spring Tire for NASA, which consisted of several hundreds of spring steel wires wound and woven into a flexible mesh, reducing the weight of the tire and ensuring its durability in soft sand and rocky areas (no one wants to change a tire on the moon). The Spring Tire is currently being reinvested and improved, using shape memory alloys like nickel titanium to adapt for missions to Mars.



[Fig.12] The Spring Tire builds on technology pioneered in the 1960s for the Apollo Lunar Roving Vehicle's wire mesh moon tire.  
► P. 36

From a visual standpoint, this airless tire looks fascinating – appearing like the translucent, embroidered and light skeleton of a tire, its metallic mesh bends and delicately wraps the rocks it encounters on its way to better moving right back to its original form in the following instant. This is made possible by the properties of nickel titanium molecules which store the energy of deformation in their specific crystal structure with stretchy bonds.<sup>15</sup>



[Fig.13] The airless Vision Concept tire, presented by Michelin as rechargeable, connected and 100% sustainable.  
► P. 36

Other companies are also conducting research in that direction and worked with NASA on non-pneumatic tire concepts destined to the Moon, to Mars, and potentially to the Earth. Michelin is currently advertising the prototype of an airless, 3-D printed tire announced as bio-sourced and biodegradable. A blue wheel with a groundbreaking structure reminiscent of a sponge, coral or lungs, which would

be useful for the humans who wish to continue to live on the Earth. However, with a closer look on its promotion by Michelin, this tire project appears to be closer to a greenwashing strategy or to a science-fiction object than to a realistic concept.<sup>16</sup>

Whatever the case may be, science-fiction and reality do often nurture each other, as shown by various rotating toroidal space station projects. In 1968, Stanley Kubrick was inspired by an existing NASA project to design the orbital space station of 2001: *A Space Odyssey* - a now famous double wheel spinning slowly to the sound of *The Blue Danube* by Johannes Strauss<sup>17</sup>, drifting around the Earth in a waltz that parallels the movement of celestial bodies and machines with that of dancers.



[Fig.14] The Space Station V in 2001: a Space Odyssey by Stanley Kubrick, 1968.  
► P. 36

Just a few years later, the *Stanford Torus*, an ambitious space habitat concept, was designed during a series of Summer Studies at the NASA Ames Research Center, on the impulse and under the direction of Gerard O'Neill, a physics Professor at Princeton University. This time, it was realized by students of the early 1970s, who were then immersed in the hippie counterculture along with its environmental and social concerns. The illustrations resulting from this project are now public domain artworks. Rick Guidice and Don Davis realized striking gouache and acrylic renderings which show landscapes from seemingly inside-out planets<sup>18</sup>, where the horizon is continually warped, dictated by the surface of the torus. Fred Scharmen looks at them as serious architectural proposals in his book *Space Settlements* and describes these fictional spaces in a very revealing way, making their complex geometrical and visual qualities tangible<sup>19</sup>:



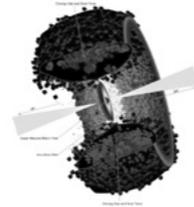
[Fig.15] Interior view of the Stanford Torus by Don Davis, 1975.  
► P. 38

*Lines on parallel planes don't converge to a single vanishing point but instead to a series of them on a*

kind of vanishing line, extending up and down like a vertical horizon. (...) As the zero-dimensional vanishing point becomes a one-dimensional vanishing line on a vertical horizon and the apparently flat, two-dimensional plane of everyday experience folds up to enclose a three-dimensional volume of space, the elements of these habitats' spatial systems act out the basic steps from a primer on geometry. And this spatial volume is also moving, rotating about an axis and spinning in orbits over given periods of four-dimensional time. From the inside, none of this complex motion is perceived directly; rather, it is implied – and simultaneously denied – by the warping ground plane.

Torus structures are largely present in the universe because magnetic fields naturally generate toroidal shapes.<sup>20</sup> In modern astronomy, the term “obscuring torus” is used to describe a dense ring of gas and dust which surrounds a dying star, containing most of the star’s ejected gas.

In 2019, while studying the core of Cygnus A, a radio galaxy situated 760 million light-years away from the Earth, astronomers observed a supermassive black hole and were able to make an image of the dusty torus surrounding it, a key feature already postulated by theorists in 1977. Strikingly, the animated visualization by the National Radio Astronomy Observatory (NRAO) makes it look very much like an actual tire.



[Fig.16] Artist's conception of the dusty torus and the accretion disk (in blue) with the jets of material ejected by the disk, around an active galactic nucleus.  
► P. 37



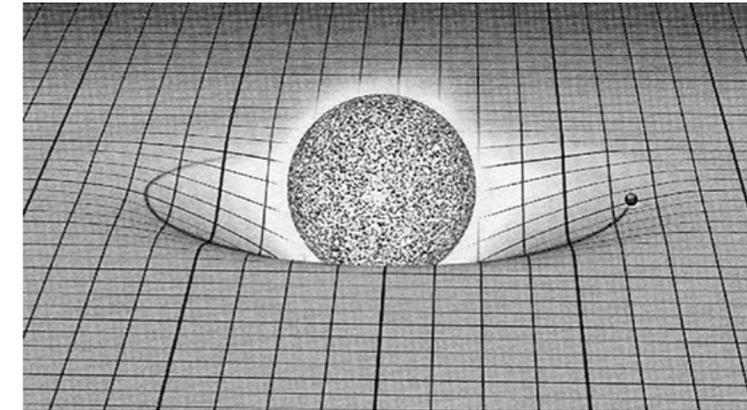
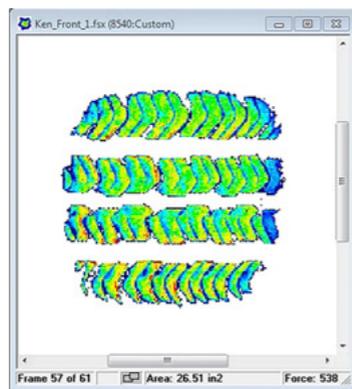
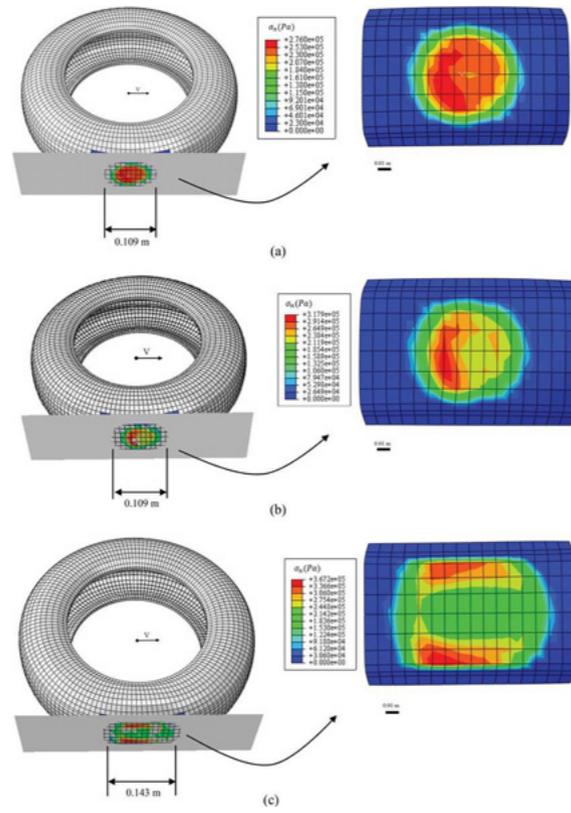
14 Read more about NASA's experiments on rotating space stations in James R. Hansen's study *Spaceflight Revolution*, 1995, p.278-282  
15 NASA has a webpage titled *Reinventing the Wheel*, consulted Feb 2 2021 <https://www.nasa.gov/specials/wheels/>  
16 See Michelin's promotion of the *Vision Tire*, consulted Feb 1 2021 <https://www.michelin.com/en/innovation/vision-concept>  
17 Fred Scharmen, *Space Settlements*, Columbia books on Architecture and the City, 2019, p. 256  
18 This term was coined by Stewart Brand, the editor of the *Whole Earth Catalog*, who was involved in O'Neill's project by funding it with his Point Foundation  
19 Scharmen, op. cit., p. 68  
20 Ken Barker, *Rolling torus structures in astronomy*, *Astronomy & Geophysics* 42, 2001, p. 4.21



We adapt ourselves, with a few variations,  
into the network of possible itineraries.



We adapt ourselves, with a few variations,  
into the network of possible itineraries.





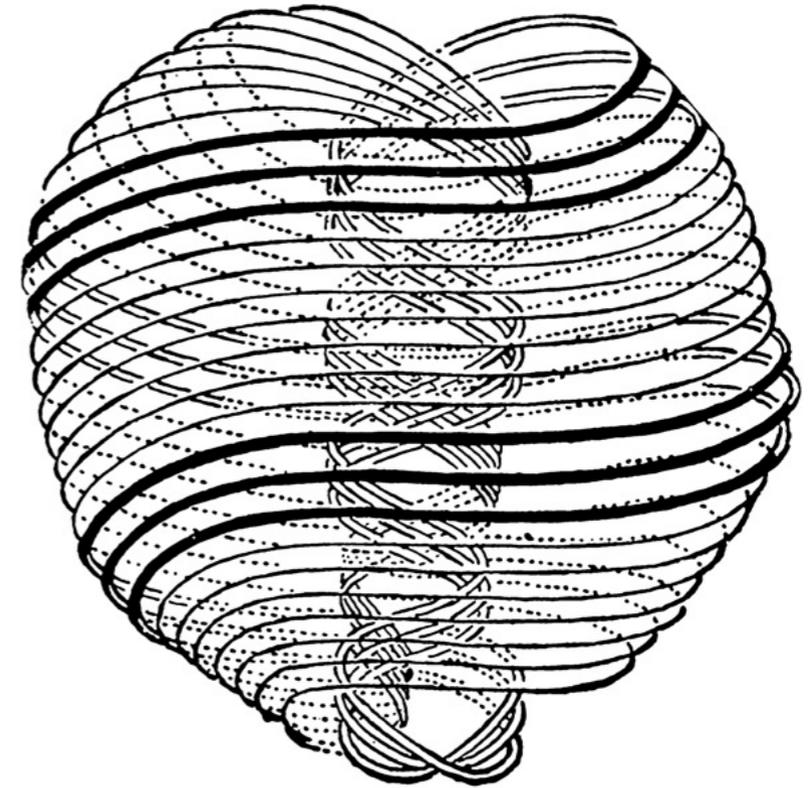
**Tighten your seat belt.  
You never had a trip like this before.**

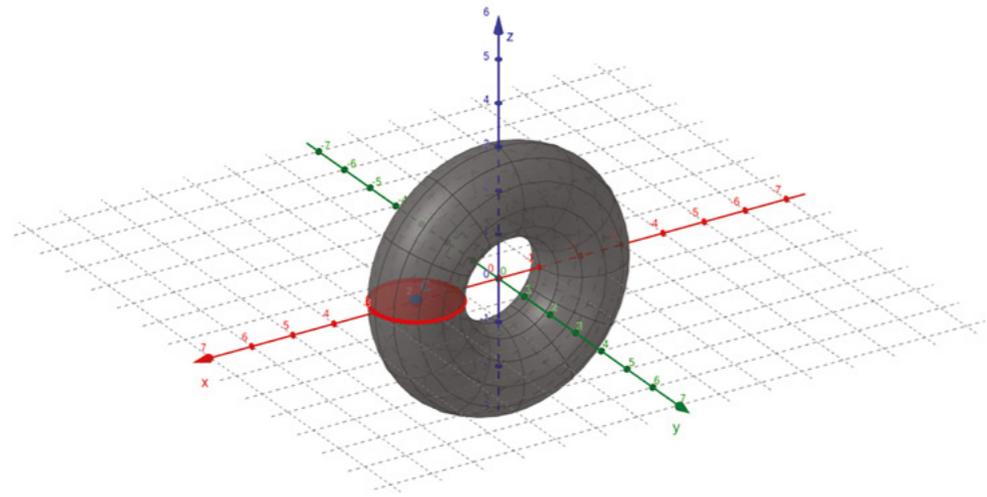
**VANISHING POINT**

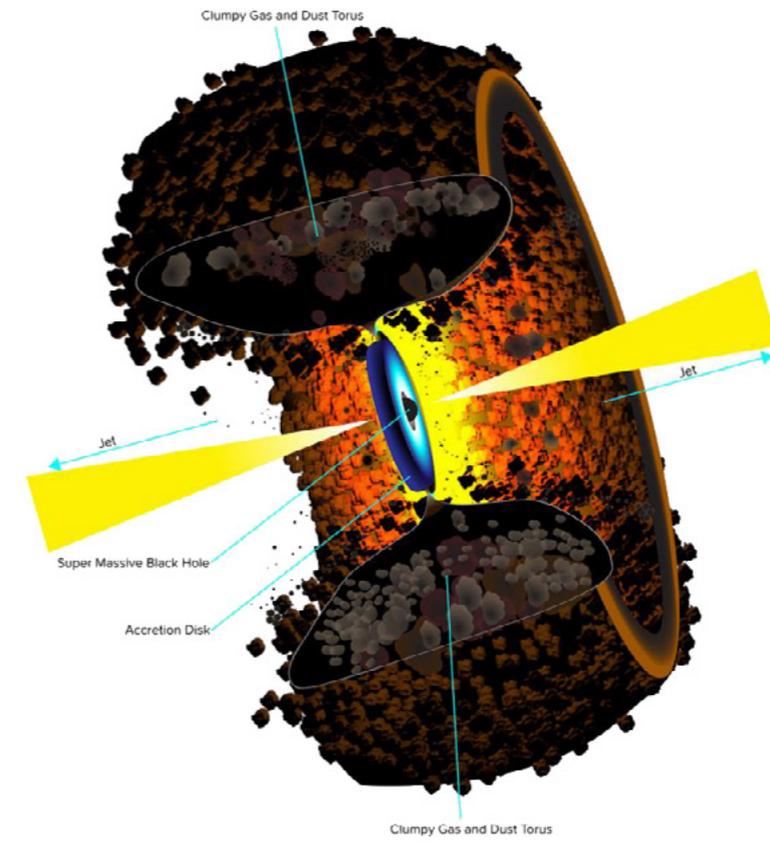
Hear the supercharged sounds of  
DELANEY & BONNIE & FRIENDS  
MOUNTAIN  
JERRY REED  
BIG MAMA THORNTON  
THE O'JAYS  
KIM & DAVE

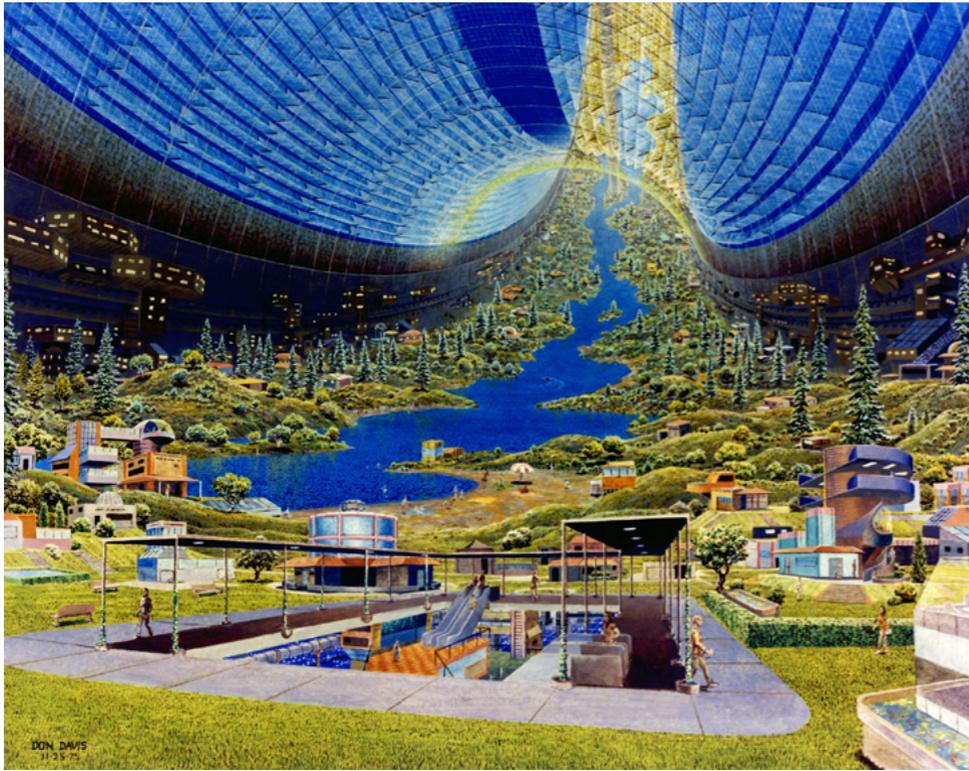
20th Century-Fox presents  
**BARRY NEWMAN** in **VANISHING POINT** A CUPID PRODUCTION **DEAN JAGGER** **CLEAVON LITTLE** as Super Soul  
produced by NORMAN SPENCER directed by RICHARD C. SARAFIAN screenplay by GUILLERMO CAIN Executive Producer MICHAEL PEARSON COLOR BY DE LUXE™  
Original soundtrack available on Armo Records

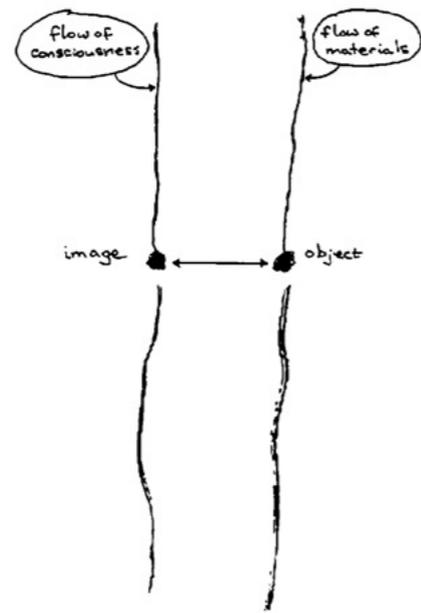
GP ALL AGES ADMITTED  
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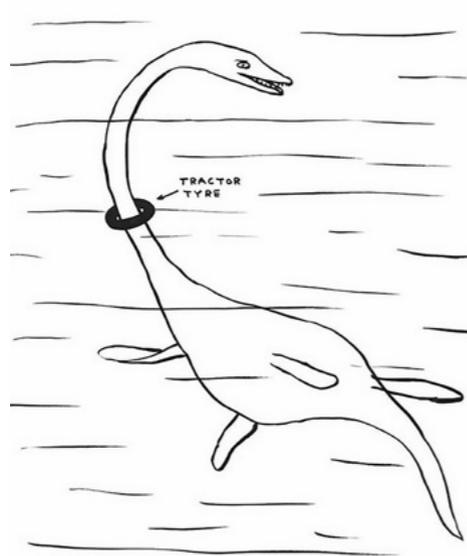












## Dark matter

Shapeless bits of rubber  
Former sap of a tree  
Over millions of years  
Plants and animals decayed  
Now mixed with carbon black  
In lava-like moves  
Waves of dark sticky substance  
Bending and folding on itself  
Translucent golden cords  
Glistening parallelly  
With lemon colored powder  
And silicon pellets  
Falling from the conveyor belt  
Into an automated furnace.

Flooded by a heavy smell  
We can only imagine  
The choreographed alchemy  
Of the tire factory.

If the creation of obscuring clumps of stardust can so clearly evoke a tire, what about the dark matter that forms a terrestrial manufactured tire?

The plainness of the tire's colour and shape hides a complex object that is not only composed of rubber, but also of a minimum of 200 different materials such as carbon black, silicon, sulphur, plasticizers, vulcanization agents, steel and polyester cords, put together during a long manufacturing process. The tire is shaped by inflating the central section of a rotating cylinder where most of its compounds have previously been assembled on many different layers of rubber and cords, which form the so-called radial carcass: a network of cables radiating around the tire. The superposition of wires arranged obliquely on the crown of the tire creates a triangular structure that prevents deformation. The tread is fitted as the last rubber layer – the one that will be in contact with the ground. The blank tire is then cured in a pattern-engraved mould, where hot water pushes the material to the sides of the mould and steam enables the vulcanization of the rubber.

During this process, the rubber goes from a plastic to an elastic state and becomes chemically bound to the steel and fabric cords.<sup>21</sup>

It is instructive to examine the different origins of the tire's two main components: natural and synthetic rubber.

Natural rubber is collected in the form of latex from a tall deciduous tree, *Hevea Brasiliensis*. Latex is a viscous and milky sap present in the cells of many common plants, such as dandelion. Although its biological function is not yet fully known, latex seems to help the plants heal after an injury by covering



[Fig.17] Image showing the tapping of a bark in 1906, from the book *Hevea Brasiliensis or Para Rubber: its botany, cultivation, chemistry and diseases* by Herbert Wright, controller of an agricultural experiment station in Ceylon.  
► P. 40

the wound and creating a protective barrier against harmful bacteria or insects. Hevea's latex contains an especially large amount of rubber (about 30%) and is distributed by a connected network of latex tubes. Thanks to this tree's specific system of vessels, rubber can be harvested with an incision made in the trunk, which was already done so by ancient Mesoamerican peoples. The various steps for producing rubber include incision of the trees (called tapping), latex collection, filtration, coagulation with formic acid, pressing and drying. It is only during its drying process that latex goes from an extremely luminous white color to the typical golden or brownish color of rubber.<sup>22</sup>

Originally from the Amazonian forest, Hevea was introduced to Ceylon by the English at the end of the 19th century and later spread widely in the British colonies. The world's rubber supply now comes in great majority from Asia – Thailand and Indonesia being the principal producers.<sup>23</sup>

Synthetic rubber is made from the polymers found in crude oil. As a petroleum byproduct, it therefore finds its origin in nature: crude oil is a fossil fuel created by the decomposition of marine organisms (mostly animal and vegetal plankton) accumulated inside sedimentary basins in the depth of oceans and lakes, dating back up to 350 million years.<sup>24</sup>

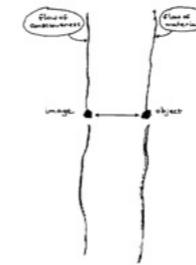
It is staggering to think that we mindlessly use on a daily basis a biomass which contains the energy of once-living beings, accumulated and transformed by millions of years of sedimentation – but this is precisely the process that links the tire's matter to the drift, be it a continental movement or a mental journey: it is an alluvial, curved and rippled flow, a tectonic stream, an energy that we can connect with.



[Fig.18] Harvested latex is diluted with water and filtered before its coagulation with added formic acid.  
► P. 41



[Fig.19] Dried rubber sheets coming out of the smoke house of a small production farm in Kerala.  
► P. 41



[Fig.20] Diagram drawn by Tim Ingold, showing the flow of consciousness, the flow of materials and focus points producing an image and an object.  
► P. 40

The energy of the driver's "actual participation" on the freeway that Joan Didion describes resonates with Tim Ingold's essay *Making: Anthropology, Archaeology, Art and Architecture*, which explores "participant observation" as a way to engage practically and sensuously with our environment's substance in order to understand it deeply and to integrate this knowledge. In this book, Ingold deconstructs the hylomorphic model – Aristotle's very binary doctrine which states that every physical object is a combination of two inherent elements: matter and form<sup>25</sup>, which leads to today's common opposition of things and beings assuming that humans, with a straightforward agency, can brutally dictate desired forms on an inert, passive matter.

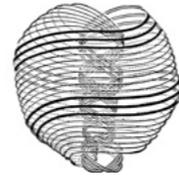
Combining Deleuze & Guattari's theory on the "matter-flux"<sup>23</sup> with Jane Bennett's political insights of her essay *Vibrant Matter*<sup>27</sup>, Ingold adds his own reflections on the vitality of matter, apparently influenced by his personal experience as a musician:

*I want to think of making, instead, as a process of growth. This is to place the maker from the outset as a participant in amongst a world of active materials. These materials are what he has to work with, and in the process of making he 'joins forces' with them, bringing them together or splitting them apart, synthesising and distilling, in anticipation of what might emerge. The maker's ambitions, in this understanding, are altogether more humble than those implied by the hylomorphic model. Far from standing aloof, imposing his designs on a world that is ready and waiting to receive them, the most he can do is to intervene in worldly processes that are already going on, and which give rise to the forms of the living world that we see all around us – in plants and animals, in waves of water, snow and sand, in rocks and*

clouds – adding his own impetus to the forces and energies in play.<sup>28</sup>

Ingold argues that it is possible, desirable and fruitful to play with the matter's active energy, to follow this flux in a continuous and modulated dance guided by intuition, like a drift within the stream of the matter's subtle movements. Bringing together a non-homogenous personhood and a non-homogenous thinghood, the movements and gestures of the maker enable his or her work to bear fruit by joining forces with the becoming of the material.

*As with any dance, this should be read not laterally, back and forth, but longitudinally as a movement in which partners take it in turns to lead and be led or – in musical terms – to play the melody and its refrain. In the dance of animacy, bodily kinaesthesia interweaves contrapuntally with the flux of materials within an encompassing, morphogenetic field of forces.*<sup>29</sup>



[Fig.21] The basic unit of matter, or ultimate physical atom as identified and illustrated by Annie Besant and Charles W. Leadbeater in *Occult Chemistry : Clairvoyant observations on the chemical elements*.  
► P. 33

## Dancing for an assemblage

The cloudy images show  
A philosopher with long fingernails  
Drawing two eyes  
And a spiral  
On the blackboard of a crowded classroom  
Filled with cigarette smoke.  
The sound of his mellow voice  
And that of students coughing  
Both resonate  
Deep in the nearby trees.

21 See the promotion videos *How a tire is built* on Michelin Truck Tire Youtube channel and *Today's Truck Tires: The Inside Story* on Bridgestone Commercial Youtube channel

22 The video *Natural rubber tapping and latex processing* by Gravity Production (documenting methods of farming practiced in India) shows all the rubber production steps of a farm in Kerala

23 *Rubber*, Alan N. Gent Alan, Encyclopedia Britannica

24 *Petroleum*, J. P. Riva, Priscilla G. McLeroy and Gordon I. Atwater, Encyclopedia Britannica

25 "Hylomorphism, (from Greek *hylē*, "matter"; *morphē*, "form"), in philosophy, metaphysical view according to which every natural body consists of two intrinsic principles, one potential, namely, primary matter, and one actual, namely, substantial form. It was the central doctrine of Aristotle's philosophy of nature." *Hylomorphism*, Encyclopedia Britannica

26 Gilles Deleuze and Félix Guattari, *Mille Plateaux*, pp. 507-513

27 Jane Bennett, *Vibrant matter. A political ecology of things*

28 Tim Ingold, *Making : Anthropology, Archeology, Art and Architecture*, p. 21

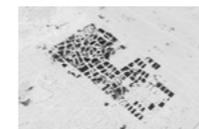
29 *ibid.*, p. 101

Tim Ingold proposes to distance ourselves with the terms artifact and material culture, which we directly inherited from the hylomorphic model. If one thinks of bringing personhood and thinghood closer, which might be very interesting for artists, it is instructive to also consider Beatriz Colomina & Mark Wigley's essay *Are we human: notes on an archeology of design*, that invites us to look at artifacts as parts of the body and brain, even as thoughts capable of reinventing the human.

*What is human is the gesture of externalization, which is not from some preexisting interior, like thoughts in the brain, but is a gesture that constitutes a new sense of interior. The human is always being invented as such by the gestures that transform it. Brain, body and artifact cannot be separated. Thinking only occurs in the intermingling between them. Artifacts themselves are thoughts that potentially also trigger new modes of thought.*<sup>30</sup>

In the case of artifacts such as tires, it might even be impossible to separate them from our body. According to a recent study, the abrasion of tires is the unexpected source of major atmospheric pollution. It signals that these up-to-that-point underestimated road microplastics travel through airborne dispersion to end up in the oceans, and reports that about 30% of microplastics (1 to 5 mm size particles) in freshwater and marine ecosystems are precisely tire wear particles.<sup>31</sup>

Another study published in Science in January 2021 accuses a substance called 6PPD, which is used as a preservative for car tires, as the toxic chemical responsible for a mass die-off of Coho salmon on US West Coast.<sup>32</sup> The bodies of salmon are being colonized by tires, and presumably, the same is true



[Fig.22] The world's biggest tire graveyard in Sulaibiya (Kuwait) counts approximately 7 million discarded items.  
► P. 39

for many of the fish which end up on our plates. It is only newly being investigated, but it seems that we are literally breathing, drinking and eating a great deal of tire particles.

This might be one of the reasons why we do have so much trouble to get rid of the car: it is not only an extension of our bodies, it has also truly become a component of our flesh. Tire particles have made their way deep into our cells. How will our bodies interact with them? And the ones of all living beings on the Earth and in its oceans? Will they all be so intoxicated that they will be “rolling down streams, unable to swim upright”,<sup>33</sup> like the salmons? Will they ultimately be able to transform the particles and process them to create new shapes, new textures?

This is triggering anticipation scenarios and echoing with B-movies like *Mad Max 2* (George Miller, 1979), *Street Trash* (J. Michael Muro, 1987) or *Rubber* (Quentin Dupieux, 2010). With a little help of popular culture, we can easily imagine our fluids becoming a primordial soup for the spontaneous generation of new species, be it cyberpunk or blob-like hybrids. In the end, if we learn how to dance and drift with the matter’s flow, maybe an unexpected form of metabolic resilience will arise.



[Fig.23] Tractor Tyre  
by David Shrigley,  
2020.  
► P. 44

## Rubber woman

Friction  
Fiction  
And Didion

Will you tell me Joan,  
Where are we heading?

30 Beatriz Colomina & Mark Wigley, *Are we human? notes on an archeology of design*, p. 52

31 Evangeliou, Grythe, Klimont, et al, *Atmospheric transport is a major pathway of microplastics to remote regions*, p. 1

32 Oliver Milman, *Pollution from car tires is killing off salmon on US west coast, study finds*, in *The Guardian*, Dec 3 2020

33 *Ibid.*

This stroll through the substance of the tire made me focus on various aspects: the tire's connection to what I call the sense of drift, the tire's interaction with gravity, its form, its matter, its effects on the Earth and our bodies. What I had not expected is that the drift would be a recurring element actually connecting all of the features examined. Indeed, I realized that the sense of drift which I long for so much is not only resonating with the search for the flow of matter – expressing itself in a tremendously slower or tremendously faster time scale – but may be even to the state of flow that can be achieved along an artistic process.

In this state of flow, the strange poetic quality of the words I found in scientific or educational videos as well as in engineering or botanical research publications somehow merged with the more literary words of writers and philosophers, and they became an elastic material to play with.

Joan Didion's writing was the stone by which I started this study, and her words accompanied me throughout the entire journey. Her time was the hectic twilight of the sixties, mine is very different but also seems to be at a turning point, where events are so uncanny that it becomes helpful to observe specific elements and let them carry us into their dance to unexpected places, in order to overcome their absurdity.

One last aspect of the tire which I wanted to address was how female artists approach it, for it is commonly considered as an object for male use. I discovered that many women<sup>34</sup> have embraced this object and used it in very different ways – critical, sculptural, sensory, and playful – as a claim, as an iconic reference, as a sculptural object, as a raw

material or as a ready-made. However, at this point, analyzing a series of various works without seeing them in real or meeting the artist in the flesh would lack precisely the exchange and the embodied experience that are important to me.

I was therefore thrilled to discover Vanessa Billy's latest works shown in October 2020 at Helmhaus in Zurich<sup>35</sup>. I felt that they brought together extremely contemporary questions as well as aspects of an ancient knowledge, and was eager to directly ask her some questions about her personal experience of working with tires and her relationship to matter. The interview I conducted with her encompasses many of the elements I have been exploring and serves as an appendix to this study.

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34 Lydia Benglis, Vanessa Billy, Chakaia Booker, Latifa Echakhch, Sylvie Fleury, Anita Molinero, Cady Noland, Delphine Reist et al.

35 */Natur/Kunst/Tiere/Körper/Maschinen/Menschen/Gefühle/* was a collective exhibition with Vanessa Billy, Leda Bourgogne, Stefan Burger, Florian Germann and Mélodie Mousset, shown from Sept 25 to Nov 15 2020 at Helmhaus Zurich

## Conversation with Vanessa Billy

When I enter Vanessa Billy's studio, the sun gently bathes the space, offering an oblique and contrasting light that defines the shape of every tiny detail. A smell of spruce coming from the nearby soap factory floats hazily in the air. Three huge tires share the room with a model of the human spine, a variety of bottles, containers, plaster, resin tests and casts, old books and found marine objects. It is relatively cold as she preferably does not switch the heating on. We warm up with a cup of tea while I can't stop looking at a tractor tire covered with a dripping layer of blue silicon.

*The works Centipedes and Ouroboros which you have shown conjointly in an installation at Helmhaus are both based on the tire shape and pattern. You have also previously worked with engines and inner tubes. What was the process that led you to these kinds of objects?*

*Vanessa Billy* I think the first kind of industrial element I used was sump oil, old used engine oil that needs to be taken out every now and then. I was very much interested in using materials that are raw, or natural, that you find as such and that have only been altered by natural phenomena in contrast with industrial materials that have been processed by human hands. I used Vaseline quite a lot at that

time, as a material that comes from petrol but is transformed in such a way that it is completely different at the end: it's transparent, body friendly, it's used in cosmetics, whereas sump oil or gasoline are used to propel cars and pollute the air at the same time. I realized that they have a similar origin, and that we have manipulated them in order to make them reach us as consumers.

*Was it this contrast that made you look further into objects connected to oil?*

VB In my work I try to get closer to what these things really are, to feel how they respond, how they behave as a material. At the time I was applying sump oil to paper to see what happens, to see what is the black in it, what is the oil in it – because unless you work in a garage you are not going to ever have contact to it, even though you are a user of it because it is part of the car that you are going to be driving at some point. From then it moved on to becoming interested in the actual motor as an object, as a sculpture really. It is such a confusing object when you don't know anything about mechanics: you have no idea what goes where and what does what and how this is actually moving cars! It was this kind of mystery and this sculptural quality that made it interesting to me: the shapes, the tubes that go into one another, the plastics, the metals, the electric wires.

*How was your experience with the motors?*

VB I showed two motors that were hung in a gallery, and as often, when you actually do what you had in mind, you realize there are things that you had not anticipated: the smell was really strong for example. The motors



[Fig.24] A tractor tire covered with blue silicon in Vanessa Billy's studio  
► P. 42

kept dripping and this garage smell was filling the whole space. I knew I didn't want clean motors: I wanted old, used, dirty motors that hadn't been stripped, with all the bits still hanging. It's only when they were hung in the gallery that I realized there was all this stuff happening: all the leaks! I didn't even know what it was, if it was sump oil or coolant, because something was more like gel.

*Almost like body fluids!*

VB Exactly, there were very much like organs, they looked like hearts that had been ripped out and it wasn't something that was clear to me when I was making that work. I guess it's through thinking of the substances of the world and how they are manipulated by the human species that I got to the tires too. I think the reason why I make art is to try to understand what we are part of, what is around us, to sense it, to be mentally and physically in contact with what it is.

*It very much echoes what I was reading about the vitality of matter and the way you actually understand it very differently when you process it, when you are physically involved with it. Is your relationship to matter guided by its visual aspect or by the sensations you have with the materials and their energy?*

VB There is this interest or this fascination – you keep thinking about a certain thing, certain materials. For example, when I first used the inner tubes they were very much a response to the exhibition space and its three big, really tall columns, which were such strong and sculptural elements. It comes from a lot of different interactions, perhaps also unconscious. Sometimes it doesn't work at all, your intuition might be wrong. The object

has a physical reality that has to be experienced and has also aspects that conceptually pull together different ideas. But I don't think there is a formula, I don't like works that are driven by formulas, to me it just falls dead. The processes of discovery and failure go together and this is what is interesting – you don't know where it is going. Otherwise I would be really bored, although it would make my life probably a lot easier!

*But your work triggers a lot of associations and seems to be nourished by them too. You compared the motors with various internal organs. In the same way, or rather the opposite way, you built tires with curved human backs.*

VB I think it all goes very slowly. First, I had been interested in the idea of the spine, and I had made moldings of human backs that looked almost fossilized, curled up like embryos. I don't think it was clear it had anything to do with tires, I surprised myself. When there is only one molding on the floor it looks quite small, so it needed to be staged. I made this whole circular, vertical shape because I was trying to assemble the backs into a free-standing autonomous object, to amplify them.

*You named this piece Ouroboros, was the idea of alchemy present in the making process?*

VB It's only when I first joined them, only when it physically was there – the head going into the bum – that I saw the idea of eating itself up and I felt it had to be the title. Alchemy has to do with materials in general: how everything affects everything, how one thing becomes another. I never tried to use it for itself, but it is there in the materials: the idea that nothing ever disappears.



[Fig.25] Vanessa Billy, *Ouroboros* (Carrara Jesmonite, glassfibres, fabric), 2020. ▶ P. 43



[Fig.26] Vanessa Billy, *Centipedes* (silicone, pigments, plastic tubing) at Helmhaus, 2020. ▶ P. 43

*Maybe the idea of transformation also has to do with these unconscious associations you only see once the work is installed or finished?*

VB Yes, you only entirely grasp it when it is outside of the studio actually. But there are always notions that are quite clear to me: trying to get somewhere that has meaning, that says something about the moment we live in.

*Do you deliberately address the question of the environmental crisis in your work?*

VB Yes, definitely, because otherwise I would find it meaningless. Why bother if it doesn't relate to my life now? I remember being little and saying to my father: "we shouldn't be using cars, the world is heating up, it is polluting everything" and he just said: "don't worry, the sun is going to heat up the Earth anyway!". I felt frustrated that there was no discussion. Now it has really become a discussion. But at the time, it was just the beginning. This ecological threat, it has been with me forever. Somehow making art is how to deal with it, even though I often think I should either become a writer and just use a pen and paper, not all these materials!

*Sometimes I have trouble to accept that my work often focuses on problematic objects such as cars instead of something more positive or more joyful. How do you deal with working on heavy questions and showing what is really scary, almost impossible to embrace?*

VB My own issue is more towards the aspect of preaching to the converted, which you do when you do anything in an art context. Then I need to be an activist. This I find really difficult to deal with. But there are definitely different levels, it's existential in a way. I mean, can you think of any good art that hasn't a

really hard aspect to it?

You're right, but personally I need a lighter element in opposition with this hard aspect. In your work at Helmhous, the Centipedes are really scary, but when you get closer to the Ouroboros tires and realize that they are actually human backs, head going into the bum, for me it has a humorous component that brings this balance.

VB Like a possible escape? Yes, hopefully this redeems the work.

Did you have a gender aware approach when you decided to work with tires?

VB It is not my drive to address masculinity, but it must be there somewhere because we are in this capitalist system where nature, the other, the woman, the weaker, is exploited. But it's interesting to think of the sex of materials! When I was using a lot of concrete early on in my career, I was already told that it was surprising to do so for a woman. I was quite conscious that I was not using it in a standard way: I was not making perfect molds, I was trying to use it as a soft material, although generally it is used for its strength. I'm interested in contrasts, in not using materials in the way they are supposed to be used, and discover failures or certain aspects that you wouldn't notice otherwise. I haven't been trained as a sculptor – the first time I worked with concrete, I was mixing it with my bare hands!

Schwerzenbach, January 19, 2021



[Fig.27] Illustration of the Ouroboros with the words ἓν τὸ πᾶν ("the all is one") from the Chrysopoia of Cleopatra, 10th/11th Century. ▶ P. 44

## Bibliography

- Barker Ken (2001) *Rolling torus structures in astronomy*. Astronomy & Geophysics Volume 42, Issue 4, Oxford University Press, consulted Feb 3 2021. > <https://doi.org/10.1046/j.1468-4004.2001.0420044.21.x>
- Baudrillard Jean (1986) *Amérique*. Editions Grasset
- Behroozinia Pooya, Khaleghian Meysam, Taheri Saied & Mirzaeifar Reza (2018) *An investigation towards intelligent tyres using finite element analysis*. International Journal of Pavement Engineering, consulted Jan 7 2021 > [https://www.researchgate.net/publication/325346307\\_An\\_investigation\\_towards\\_intelligent\\_tyres\\_using\\_finite\\_element\\_analysis](https://www.researchgate.net/publication/325346307_An_investigation_towards_intelligent_tyres_using_finite_element_analysis)
- Bennett Jane (2010) *Vibrant matter. A political ecology of things*. Duke University Press
- Benoliel Bernard & Thoret Jean-Baptiste (2011) *Road movie, USA*. Editions Hoëbeke
- Besant Annie & Leadbeater Charles W. (1919) *Occult Chemistry : clairvoyant observations on the chemical elements*. Theosophical Publishing House, consulted Jan 28 2021 > <https://archive.org/details/occultchemistryc00besa/mode/2up>
- Britannica, The Editors of Encyclopaedia (Invalid date) *Hylomorphism*. Encyclopedia Britannica, consulted Jan 29 2021 > <https://www.britannica.com/topic/hylomorphism>
- Colomina Beatriz & Wigley Mark (2016) *Are we human? notes on an archeology of design*. Lars Müller Publishing
- Deleuze Gilles & Guattari Félix (1980) *Mille Plateaux: Capitalisme et schizophrénie*. Editions de Minuit
- Debord Guy (1956) *Théorie de la dérive*. La Revue des Ressources, consulted Dec 9 2020 > <https://www.larevuedesressources.org/theorie-de-la-derive,038.html>
- Didion Joan (1979) *The White Album*. Farrar, Straus and Giroux
- Evangelidou N., Grythe H., Klimont Z. et al. (2020) *Atmospheric transport is a major pathway of microplastics to remote regions*. consulted Feb 2 2021 > <https://doi.org/10.1038/s41467-020-17201-9>
- Gent Alan N. (Invalid date) *Rubber*. Encyclopedia Britannica, consulted Jan 20 2021 > <https://www.britannica.com/science/rubber-chemical-compound>
- Gilroy Paul (2010) *Darker Than Blue*. The Belknap Press of Harvard University Press
- Hansen James R. (1995) *Spaceflight Revolution: NASA Langley Research Center from Sputnik to Apollo*. National Aeronautics and Space Administration, consulted Feb 5 2021 > <https://history.nasa.gov/SP-4308.pdf>
- Ingold Tim (2013) *Making: Anthropology, Archeology, Art and Architecture*. Routledge
- Kirollos Masood (Invalid date) *Solid Torus*. Ximera open courses, the Ohio State University, consulted Jan 28 2021 > <https://ximera.osu.edu/kirollos-masood/1152/torus/torus>
- Kuraishi Takashi, Takizawa Kenji & Tezduyar Tayfun (2019) *Space-time computational analysis of tire aerodynamics with actual geometry, road contact, tire deformation, road roughness and fluid film*. Computational Mechanics, consulted Jan 28 2021 > [https://www.researchgate.net/publication/334184985\\_Space-time\\_computational\\_analysis\\_of\\_tire\\_aerodynamics\\_with\\_actual\\_geometry\\_road\\_contact\\_tire\\_deformation\\_road\\_roughness\\_and\\_fluid\\_film](https://www.researchgate.net/publication/334184985_Space-time_computational_analysis_of_tire_aerodynamics_with_actual_geometry_road_contact_tire_deformation_road_roughness_and_fluid_film)
- Laderman David (2002) *Driving Visions: Exploring the Road Movie*. University of Texas Press

## Bibliography

Lavery Carl (2018) *Rethinking the Derive*. Performance Research, A journal of the Performing Arts, Issue 7: On Drifting, consulted Dec 29 2020 > <https://www.tandfonline.com/doi/full/10.1080/13528165.2018.1557011>

Milman Oliver (2020) *Pollution from car tires is killing off salmon on US west coast, study finds*. The Guardian, Dec 3 2020, consulted Dec 5 2020 > [https://www.theguardian.com/environment/2020/dec/03/coho-salmon-pollution-car-tires-die-off?CMP=share\\_btn\\_link](https://www.theguardian.com/environment/2020/dec/03/coho-salmon-pollution-car-tires-die-off?CMP=share_btn_link)

Perkowitz Sidney (Invalid date) *Relativity*. Encyclopedia Britannica, consulted Feb 5 2021 > <https://www.britannica.com/science/relativity/Curved-space-time-and-geometric-gravitation>

Pope Richard (2010) *The Jouissance of the Flâneur: Rewriting Baudelaire and Modernity*. Space and Culture, 13(1), 4–16, consulted Jan 30 2021 > <https://doi.org/10.1177/1206331209353682>

Riva J. P., McLeroy Priscilla G. & Atwater Gordon I. (Invalid Date) *Petroleum*. Encyclopedia Britannica, consulted Feb 1 2021 > <https://www.britannica.com/science/petroleum/Origin-of-hydrocarbons#ref50707>

Scharmen Fred (2019) *Space Settlements*. Columbia books on Architecture and the City

Trudel Alexandre (2009) *Des surréalistes aux situationnistes*. CONTEXTES, consulted Dec 29 2020 > <http://journals.openedition.org/contextes/4421>

Wright Herbert (1906) *Hevea Brasiliensis, or Para Rubber, its botany, cultivation, chemistry and diseases*. Ferguson, consulted Jan 31 2021 > <https://www.biodiversitylibrary.org/item/71033#page/1/mode/1up>

Zarka Raphaël (2011) *Free Ride: Skateboard, mécanique galiléenne et formes simples*. Editions B42

## Video sources

AA (2014) *A Torus Meets an Equation*. Hotel Infinity, consulted Dec 30 2020 > <https://youtu.be/MgO244qrxGA>

AA (2019) *First Observation of Torus Surrounding the Supermassive Black Hole at the Core of Powerful Radio Galaxy*. NRAO, consulted Dec 29 2020 > <https://youtu.be/nMFo55REXwQ>

AA (2014) *How a tire is built*. Michelin Truck Tires, consulted Dec 28 2020 > [https://youtu.be/CX7\\_6mL7ksA](https://youtu.be/CX7_6mL7ksA)

AA (2019) *Natural rubber tapping and latex processing*. Gravity Production, consulted Feb 7 2021 > <https://youtu.be/A-08PQarZVE>

AA (2019) *Rubber tapping method in Kerala*. Consulted Feb 1 2021 > <https://youtu.be/H-qNt4FQI24>

AA (2012) *Today's Truck Tires : The Inside Story*. Bridgestone Commercial, consulted Jan 30 2021 > <https://youtu.be/wA0dX-phO2Q>

Debord Guy (1961) *Critique de la séparation*. Carlotta Films, consulted Jan 2 2021 > <https://youtu.be/FsVOWOayWAB>

Dupieux Quentin (2010) *Rubber*. Arte France cinéma

Hellman Monte (1971) *Two-lane Blacktop*. Universal Pictures

Kubrick Stanley (1968) *2001: A Space Odyssey*. Metro-Goldwyn-Mayer

Malick Terence (1973) *Badlands*. Warner Bros.

Miller George (1982) *Mad Max 2*. Warner Bros.

Muro J. Michael (1987) *Street Trash*. Lightning Pictures

Rafelson Bob (1970) *Five Easy Pieces*. Columbia Pictures

Sarafian Richard C. (1971) *Vanishing Point*. 20th Century Fox

## Image captions &amp; credits

[Fig.1] Joan Didion, smoking in her Corvette Stingray, 1974. (photography by Julian Wasser)

[Fig.2] Barricade of overturned cars in rue Gay-Lussac, Paris, May 1968. (photographer unknown)

[Fig.3] Stills from Guy Debord's film *Critique de la séparation*, 1961. (Carlotta Films)

[Fig.4] A visual representation of spacetime: a star warping space, as a dense ball would warp a rubber sheet. (Columbia University, consulted Feb 8 2021) > [https://ccnmtl.columbia.edu/projects/mmt/frontiers/web/slideshows/spacetime\\_warping\\_a\\_rubber\\_sheet.html](https://ccnmtl.columbia.edu/projects/mmt/frontiers/web/slideshows/spacetime_warping_a_rubber_sheet.html)

[Fig.5] Normal contact pressure distribution in the contact patch area ; (a) tyre with the normal load of 2000 N and friction coefficient of 0.4, (b) tyre with the normal load of 2000 N and friction coefficient of 0.85 and (c) tyre with the normal load of 4000 N and friction coefficient of 0.4, in the study *An investigation towards intelligent tyres using finite element analysis*, International Journal of Pavement Engineering, 2018.

[Fig.6] *Vanishing Point* begins with its ending in an opening freeze-frame showing the white Dodge Challenger dissolving in a time loop. (Twentieth Century Fox)

[Fig.7] *Vanishing Point's* original poster, 1971. (Twentieth Century Fox)

[Fig.8] *The Globe of Death* (also known as *the Sphere of Fear*) is a classic animation during motorcycle gatherings. (photographer unknown)

[Fig.9] Tire footprint pressure output during a dynamic roll test, in *TireScan CrossDrive System datasheet* by Tekscan, 2018.

[Fig.10] A torus with radii R and r is the surface obtained by rotating a circle of radius r centered at (R,0) about the y-axis. (Kirolos Masood, Ximera open courses, the Ohio State

University, consulted Jan 28 2021) > <https://ximera.osu.edu/kirolos-masood/1152/torus/torus>

[Fig.11] Toroid inflatable station concept during testing, 1961. (NASA)

[Fig.12] The Spring Tire builds on technology pioneered in the 1960s for the Apollo Lunar Roving Vehicle's wire mesh moon tire, 2010. (Goodyear)

[Fig.13] The airless Vision Concept tire, presented as rechargeable, connected and 100% sustainable, 2017. (Michelin)

[Fig.14] *The Space Station V in 2001: a Space Odyssey* by Stanley Kubrick, 1968. (MGM)

[Fig.15] Interior view of *Stanford Torus* by Don Davis, 1975. (NASA Ames Research Center)

[Fig.16] Artist's conception of the dusty torus and the accretion disk (in blue) with the jets of material ejected by the disk, around an active galactic nucleus, 2019. (image by Bill Saxton, NRAO/AUI/NSF) > <https://public.nrao.edu/news/key-feature-powerful-radio-galaxies/>

[Fig.17] Image from the book *Hevea Brasiliensis, or Para Rubber, its botany, cultivation, chemistry and diseases* by Herbert Wright, controller of the Agricultural Experiment Station in Ceylon, 1906. (photograph by D. L. Gunawardane)

[Fig.18] Diagram drawn by Tim Ingold, showing the flow of consciousness, the flow of materials and focus points producing an image and an object.

[Fig.19] Harvested latex is diluted with water and filtered before its coagulation with added formic acid. Video still from *Rubber tapping method in Kerala*, 2019.

[Fig.20] Dried rubber sheets coming out of the smoke house of a small production farm in Kerala. Video still from *Natural rubber tapping and latex processing*, 2019. (Gravity Production)

*Image captions & credits*

[Fig.21] The basic unit of matter, or ultimate physical atom as identified and illustrated by Annie Besant and Charles W. Leadbeater in *Occult Chemistry : Clairvoyant observations on the chemical elements*, Theosophical Publishing House, 1919.

[Fig.22] The world's biggest tire graveyard in Sulaiibiya (Kuwait) counts approximately 7 million discarded items. (screen shot from Google maps, Feb 7 2021)

[Fig.23] *Tractor Tyre* by David Shrigley, 2020.

[Fig.24] A tractor tire covered with blue silicon in Vanessa Billy's studio in Schwerzenbach (photograph by Stéphanie Gygax)

[Fig.25] Vanessa Billy, *Ouroboros* (Carrara Jesmonite, glassfibres, fabric), 2020. (photograph by Zoé Tempest)

[Fig.26] Vanessa Billy, *Centipedes* (silicone, pigments, plastic tubing) at Helmhaus, 2020. (photograph by Zoé Tempest)

[Fig.27] Illustration of the Ouroboros with the words  $\epsilon\nu\ \tau\acute{o}\ \pi\acute{\alpha}\nu$  ("the all is one") from the *Chrysopoeia of Cleopatra*, in codex Marcianus graecus 299 fol. 188v, 10th/11th Century. (author unknown)

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