



The Power of the Tower: Nicolas Schöffer's Tour Lumière Cybernétique for La Défense (1962–1973)

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This paper looks at Nicolas Schöffer's unrealised Tour Lumière Cybernétique (1962–1973) to explore the interplay between urban data, participation, and political consensus in 1960s France. Envisioned for Paris's business district La Défense, the purpose of the tower was to help keep the city in a technological equilibrium by employing a set of automated algorithms for collecting and visualising inputs received from the urban environment. Yet Schöffer's ad-hoc disruptive interventions, the so-called perturbations that he deemed essential to the tower's program, suggest that he regarded the outcome of data collection to be too monotonous to maintain that desired equilibrium.

This article stands at the intersection of histories of architecture and urban data-processing. It aims to suggest that Schöffer's TLC tower presents an indirect version of participation, one that, rather than fostering self-determinacy or proposing a political agenda, focuses on the extraction as well as abstraction of information ultimately framed as a participatory practice.

Keywords: cybernetics; participation; Nicolas Schöffer; La Défense; urban data; urban futures



Introduction

From the early 1960s until around the OPEC oil crisis of 1973, the Hungarian-born, French-educated sculptor Nicolas Schöffer (1912–1992) steadily and very publicly advocated for the realisation of an immense cybernetic light tower in Paris's new business district La Défense (**Figure 1**). Intended to be sensitive to its immediate surroundings, the Tour Lumière Cybernétique, known as the TLC, would be covered with microphones, diodes, and turning mirrors. Programmed by a computer in its basement, the tower would send back to the city data received through a feedback mechanism. When triggered, or simply oversaturated by input, the tower was set to disappear from the Parisian horizon for 10 minutes at a time, hiding behind clouds emitted by smoke bombs (Schöffer 2018 [1973]: 34).¹

French media quickly came to regard the TLC as emblematic of the approaching technologically driven future. The tower was enthusiastically featured in mainstream journals, such as *Paris Match* and *L'Express*, and Schöffer even appeared on the popular national television program *Antenne 2* in 1971 to present the French public with a more refined version of the Parisian tower during prime time.² Supposedly, the tower's development plans also made it onto the tables of both presidents Charles de Gaulle and Georges Pompidou, whose administrations worked on allocating the tower a plot of land at La Défense. Whether it was the looming energy crisis or, as has been suggested, a waning interest in the tower's outdated proposal to maintain a 'city equilibrium' that put an end to the project is unknown.³

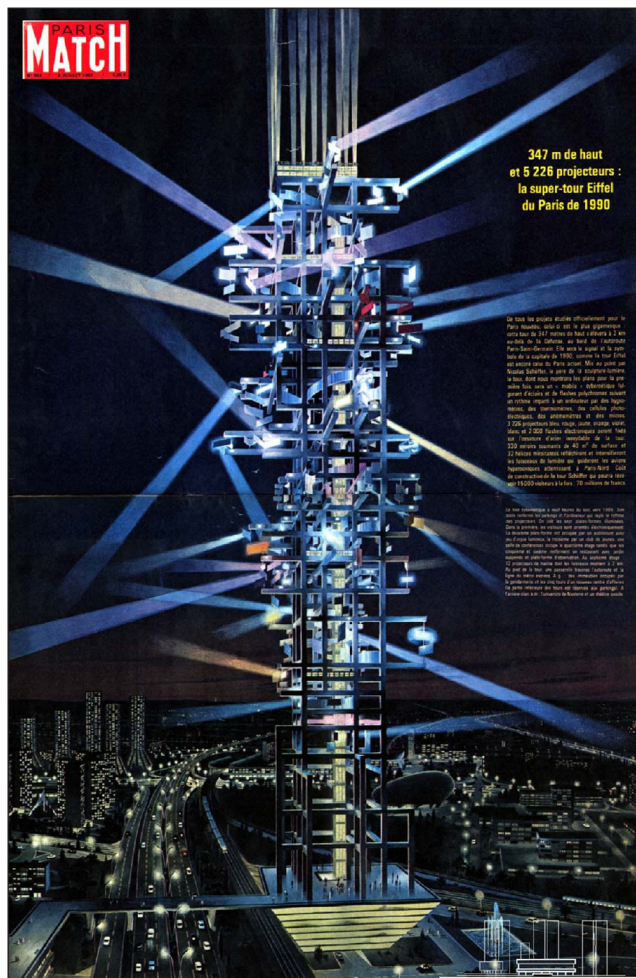


Figure 1: Schöffer's tower as it appeared in *Paris Match*, 8 July 1967. Source: Paris Match, Scoop, 2024.

Recently ‘excavated out of oblivion’, Schöffer’s projects are sparking renewed interest in connecting questions of space and technology (Oui 2018:106). In recent years, the Graham Foundation has been supporting the first English translation of Schöffer’s treatise, *La Ville Cybernétique* (1969), to bring an ‘overlooked early experiment in smart city technology’ to a broader audience.⁴ Yet, although Schöffer’s elaborate and bold visions may intrigue us today, perhaps most importantly his schemes prompt us to think about the ways in which public participation and emergent technology have become an argument for the extraction of urban data.

In earlier scholarship, Schöffer’s Parisian cybernetic light tower has been framed as a prophetic but ultimately failed 1960s fantasy, only worthy of attention because of Schöffer’s elaborate programme as well as the seemingly serious political and economic support it received. Previous studies of the project have focused on the reasons the project was abandoned (Trudel 2017), Schöffer’s metaphorical understanding and application of cybernetics to the urban environment (Darò 2014), and his larger vision of a liberating yet highly technocratic future city (Busbea 2007), as well as how Schöffer’s cybernetic tower physically and aesthetically manifested the popular idea of an ‘automated nation’ that circulated in France in the 1960s (Pierre 2011). This essay shows how urban data was essential to sustaining the tower’s programme, by comparing the design plans Schöffer advanced in *La Tour Lumière Cybernétique* (1973) and *La Ville Cybernétique* (1969) to the urban vision he proposed. It argues how and why extracting and processing data can be seen as a participatory practice in 1960s France, and why, although disturbingly problematic, the idea of ‘cybernetic participation’ may be the main and most timely lesson from Schöffer’s project for us today.

Towers with ‘Brains’

In many ways, the TLC tower for La Défense was an upscale version of realised but smaller structures Schöffer created throughout his career (Schöffer 2018 [1969]: 184–185). His first attempt at erecting a so-called ‘cybernetic structure’ was the *Tour Spatiodynamique, Cybernétique et Sonore*, a 50-meter tower created for the temporary exhibition *Première exposition internationale des matériaux et équipements du bâtiment et des travaux publics*, held at the Parc Saint-Cloud outside of Paris in 1955 (Pierre 2018: 220). This event was Schöffer’s first collaboration with the composer Pierre Henry, who created the tower’s ‘soundscape’, as well as Jacques Bureau, an engineer at the Philips electronics company, who oversaw the development of the project’s ‘electronic brain’ — a simple homeostatic, self-regulating device to maintain stability, developed for the occasion (Leblanc 2019: 21). It was quickly followed by the CYSP 1, a small mobile sculpture designed to circle around a pair of ballet dancers, created for an exhibition

on the roof top terrace of Le Corbusier's Cité radieuse in Marseille. Again, a homeostat allowed for spatial autonomy: set into motion by its encounters with the surroundings, the moving sculpture was animated by darkness and silence, while brightness and noise slowed it down (Burnham 1968: 341). The dark colours agitated the small structure, causing it to roll backwards and forwards, quickly turning and spinning around its sixteen polychrome plates, while loud spaces seemed to 'calm [it] down' (Harrison 2013: 12). This experiment led to the inauguration of the Tour Cybernétique' in 1961 in Liège, commissioned by the mayor of commerce and tourism in as a civic landmark. Like CYSP 1, this Belgian tower of 52 meters, was covered with photoelectric cells, thermometers, hygrometers, anemometers, microphones, and turning mirrors. Created as a permanent fixture for the city, it included an IBM 1961 computer, installed next to the tower and the city's Palais des Congrès, centrally located on the banks of the river Meuse. Schöffer intended for the rays of light emanating from the tower to create a reciprocal animation of city and tower and to show a direct effect, in real time, of data received and processed by the tower, thus creating a spectacle of light and sound, 'permanent' as long as the feedback loop remained fed (Schöffer 1973/2018: 34).

Later, Schöffer, in collaboration with Philips, the French car manufacturer Renault and the Italian car manufacturer Coggiola, created various cybernetic carlike structures, part automobile and part sculpture, with the aim of 'circulating cybernetically' in different European cities, constantly roaming the urban environment. Schöffer also experimented with television, music and furniture design, continuously seeking to broadcast his luminous spectacles to the 'biggest possible audience' (Holden 2019: 60).

La Tour Lumière Cybernétique

Among the tallest and most technologically complex of Schöffer's unrealised cybernetic structures was the tower he proposed for Paris's business district La Défense. Rising to a height between 327 and 347 metres and with 4,000 to 5,000 light and colour combinations, the TLC was to be an 'event' and an Eiffel tower of the 21st century (Schöffer 2018 [1973]: 44).⁵

In *La Ville Cybernétique*, Schöffer presented the tower typology as a crucial infrastructural link in a 'cybernetic city' equipped with several towers. He described how these 'immense spectacles' would 'appear, decrease, increase, or disappear' according 'to the rhythms of the atmosphere'; each of them addressing specific tasks and all controlled by the city's 'brain'; a centrally located cybernetic system (Schöffer 2018 [1969]: 186). Charged with the most ambitious task yet, the TLC in Paris was intended to simultaneously function as a work of art, a medium of communication and a governmental tool.

In *La Tour Lumière Cybernétique* (1973) Schöffer presents the TLC as an architectural project, with plans, sections, and an elevation, along with renderings that displayed its intended location in La Défense (Schöffer 2018 [1973]: 19). As the section shows (Figure 2), the TLC was designed as a simple steel structure with transverse beams holding lights, rotating mirrors, and propellers of different sizes.⁶ While the structure itself was imagined in the most minimal terms, Schöffer explains in detail the operation of the 3,226 blue, red, yellow, orange, violet, and white projectors and 2,000 electronic flashes. The pillars of light would emanate from the tower in every colour, some of them strong enough to guide the aircraft landing at Paris's Roissy Airport (now Charles de Gaulle). Public access to the tower was accommodated by several platforms that could be reached by lifts located in the centre of the structure, each of them carrying snack bars, restaurants, conference rooms or spaces for leisure (Schöffer 2018 [1973]: 33, 47–48, 72). To explain the tower's cybernetic programme, Schöffer added a 12-page mathematical report of how the tower's lights would be calculated and activated by an algorithm in the tower's 'cybernetic centre', a collection of up to three computers held in the tower's 20-metre platform base.

Schöffer set up the tower's computers to receive two kinds of input: *far* and *close*. The 'close', or local input would comprise information supplied directly by the tower's anemometers, thermometers, and photoelectric cells, such as wind speed, temperature, luminosity, and ambient noise. The 'far', or global input would reach the tower via

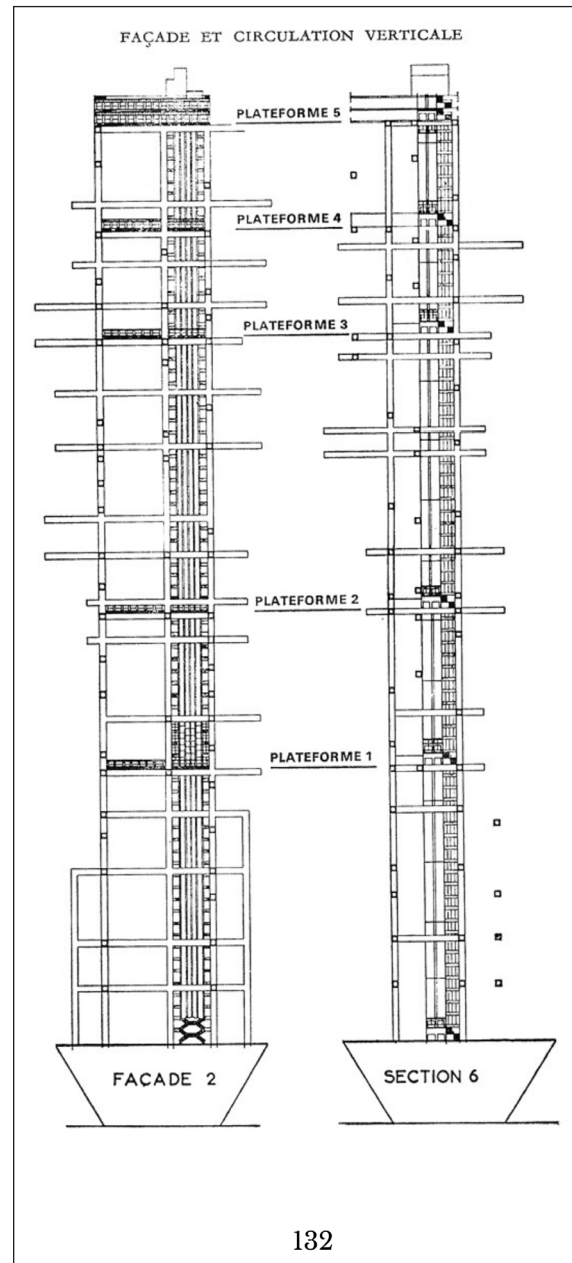


Figure 2: A façade and section of the tower as seen in Schöffer's *La Tour Lumière Cybernétique*, 1973. Source: ADAGP, Paris, 2024.

teletypewriter from civic administrative offices and companies, such as the Prefecture; PTT (Postes, Télégraphes et Téléphones); SNCF (the French national railway company); RATP (the public transport operator in Paris); AFP (the French press agency); Stock Exchange, ORTF (public radio and television); and the Institute of Meteorology, as well as the observatory, airports, hospital services, and the National Bank of France. The sound levels of heated discussions at the National Assembly were to be taped by microphones and sent to the tower via teletype.⁷ Schöffer effectively imagined a feedback loop, in constant operation, between the tower and the city. It would comprise seven components and two processes: feedback between the sensors and the program (*rétroaction directe sur les capteurs*) and negative feedback between the tower and its surroundings (*rétroaction sur l'environnement*). In a detailed schema (Figure 3), Schöffer explains how this operation was supposed to take place, identifying the tower (*la tour*) as the feedback loop's main component and environmental factors as inputs (*environnement*). Sensors (*capteurs*), as well as the two controlling elements (the *régulateur* and the *régulant*) on each side of the structure, would enable the tower to collect the data. In addition, two smaller components were likely used to introduce randomness to the programme (*perturbations accidentelles* and *cellule d'indifférence*).

According to Schöffer, these 'perturbations' were vital to the tower's programme, as they changed the output if the tower experienced any kind of stagnation in the data received.

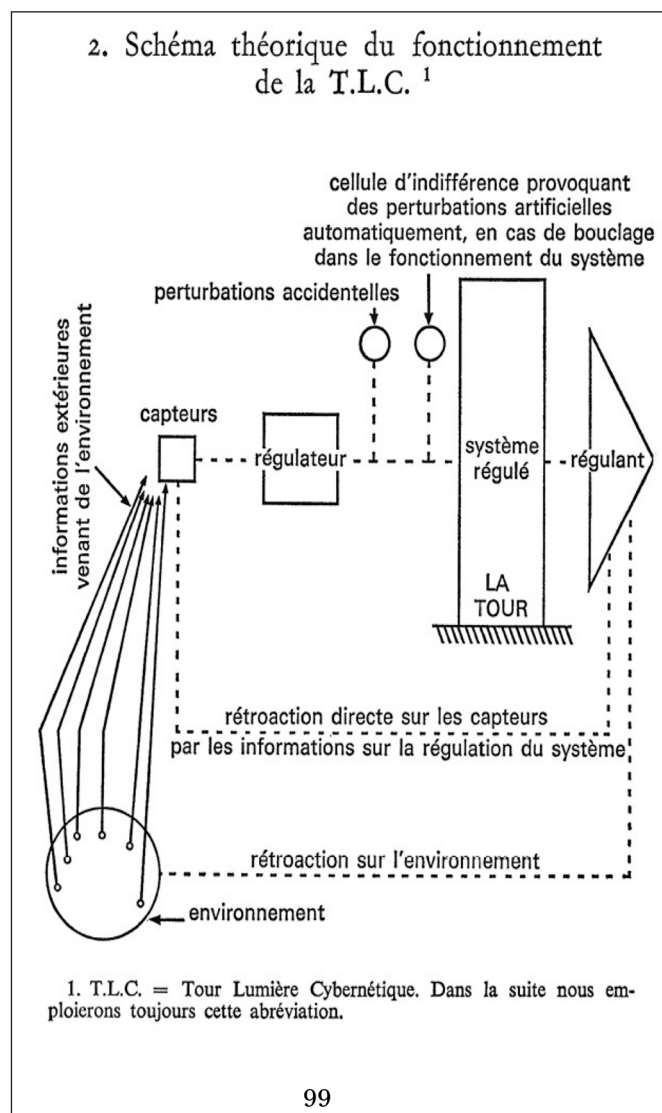


Figure 3: The 'feedback loop' between the TLC and its 'environment' Paris. From *La Tour Lumière Cybernétique*, 1973. Source: ADAGP, Paris, 2024.

Although Schöffer mentions the many kinds of data and their origin in detail, his description of the use of the collected information reveals no actual distinction between the algorithmic handling of the different types of data, which is also shown in Schöffer's diagram in **Figure 3**. Effectively, all information gained from the city's activities would influence the tower in the same way, and as such, there would be no direct correlation between input and the coloured light. Red would not symbolise a traffic jam on one of the main roads leading into Paris, nor would yellow correspond to a drop in the stock market. Schöffer writes that, after encountering a Dutch tower that measured pollution and communicated the reading to the public, he considered the possibility of communicating various environmental information. However, he only mentions in passing that such a possible feature could be added to the tower in the future (Schöffer 2018 [1973]: 32–35).

Feedback as Technique

The arrival of cybernetics in France, marked by Norbert Wiener's 1948 publication *Cybernetics: Or Control and Communication in the Animal and the Machine*, was a turning point in the development of Schöffer's aesthetics. After what seems like an almost spiritual encounter, Schöffer saw himself as the principal agent introducing cybernetics to fine arts. In his writing and in interviews, Schöffer presented cybernetics as the 'ultimate theory' by which art could be combined with technology in, as he put it, a no less than 'beneficial harmony for mankind' (Vanel 2018: 107). In *La Ville Cybernétique*, Schöffer explains how cybernetics would 'allow for a blossoming — a total opening to the diversification of all the programmes that represent the progression of society' (Schöffer 2018 [1969]: 52). Schöffer believed that cybernetics was the only possibility for 'organised control of information' and that 'thinking cybernetically' would imply being mindful 'of the vital process that keeps all phenomena in balance' (Schöffer 2018 [1970]: 12). While other early developments of cybernetics in both the arts and architecture focused on its perceived potential to facilitate more direct user involvement and functional flexibility, Schöffer saw the potential of feedback to orchestrate effects, such as light and sound, in the urban environment in a way that to him responded to societal need and supported 'social harmony' (Schöffer 2018 [1973]: 5). It seems that by employing cybernetics as an artistic method, Schöffer imagined his sculptures and towers as tools for influencing and program systems within larger systems: the city and society at large.

However, before venturing into cybernetic urbanism, Schöffer trained as a painter at the *École des Beaux-Arts*, having moved to Paris from Budapest in 1936. He arrived at interactive sculptures and later cybernetics through what he called *Spatiodynamisme*, 'Spatiodynamic art', a kind of kinetic art inherited from fellow Hungarian László

Moholy-Nagy and a particularly Hungarian tradition of geometric abstraction, coupled with a rediscovery of Constructivism, which involved sculptures sensitive to their immediate environments (Orazi: 2015: 345). After deeming painting ‘socially and artistically irrelevant’, he explains how he began to think about the influence of the arts on society, particularly the psychological effects of art. As his sculptures began taking on architectural dimensions, he developed an increasingly urban vision (Pezolet 2018: 132). Effectively, Schöffer’s spatiodynamism grew into a dynamic integration of space and time achieved by the fusion of light, movement, colour, sound, and electronic technology — elements that would be organised by what he suggestively referred to as ‘scientific developments’ (Schnee 2018).

Schöffer’s initial move from painting to sculpture and later to architecture and urbanism seems to have been spurred by the post-war ‘synthesis of the arts movement’ — art’s budding interdisciplinarity, as described by Charlotte Perriand in the context of the 1955 *Proposal for a Synthesis of the Arts* exhibition: ‘There is art in everything, whether it be an action, a vase, a saucepan, a glass, a sculpture, a jewel, a way of being’ (Perriand 2003: 237). Schöffer quickly became involved with the French synthesists after meeting the architects André Bloc and Claude Parent, who became Schöffer’s guides to architectural representation and collaborated with him on several projects during their time in GIAP (*Groupe international d’architecture prospective*) (Pierre 2018: 138–139). In France, Bloc had been instrumental in fostering a link between architecture and art with his editorial aspiration for *L’Architecture d’aujourd’hui* to include ‘all human activity’ (Bullock 2018: 172). With a similar ambition, Schöffer, together with Guy Habasque, ran a section in the journal called ‘Art, Science et Technique’, showcasing their interest in everything related to architecture, ‘from steel construction to number theory’. Architectural historian Susan Holden has argued that Schöffer later moved away from the concept of a synthesis of the arts because he wanted to create art that was ‘less formal, more immaterial in essence’, which could be why he believed feedback systems to be the ideal means for orchestrating temporal rhythms in sculpture (Holden 2019: 60), and perhaps also why participation as data later became the raw material for the TLC. Yet it seems likely that the synthesis of the arts movement provided Schöffer with an interdisciplinarity that lasted throughout his work. He regarded himself as a ‘programmer’ and his art production as a way of ‘creating creation’ and was ultimately interested in what cybernetics as a discipline could give him as an artist, not as a mathematician or an engineer. The main idea was to use feedback as a technique for directing a system towards a purpose through aesthetic and social effects (Van de Walle 2008: 89–90). The interest French media and Schöffer’s collaborators showed in his

work also indicates how as an artist he successfully foresaw, and tapped into a public desire for new technologies and was able to use this to argue for his creations to be realised at an urban scale.⁸

In France, few words had such rapid success as ‘cybernetics’, despite the few mishaps made when adapting a mainly Anglophone discipline into French. To French speakers, ‘servo-’, for example, sounded like ‘cerveau’ (brain); hence, ‘servomechanism’ became ‘brain mechanism’ in translation (Couffignal 1963: 11). Although Wiener’s main work was not translated into French until 2014, a version directed to lay readers, *The Human Use of Human Beings — Cybernetics and Society*, translated and published in 1952 as *Cybernétique et société: L’usage humain des êtres humains*, was quickly taken up as an area of academic interest, and a Cercle d’Étude Cybernétique was established, with the prominent physicist Louis de Broglie as president. Schöffer himself was never a member of the group, but he did subscribe to its publications (Ligier and Triclot 2008: 4).

The French embrace of cybernetics in the late 1950s has been described as somewhat obscure; metaphorical, consumed with how to manage political and social problems cybernetically. Jacob Krell, a historian of cybernetics, suggests that this was the case, since in France, cybernetics was free from the military and technical implications that occupied the Anglo-American cybernetic discourse (Krell 2020: 191). However, to the broader public, French cyberneticians promoted a very literal understanding of the theory’s mechanical features (Le Roux 2009: 22). In one special episode in 1958 of the popular French TV show *Répondez Monsieur X*, dedicated to cybernetics, featured the well-known cybernetician Albert Ducrocq explaining, in a room full of inventions, that although ‘cybernetics’ derives from the Greek, literally meaning ‘to govern’, it would be a mistake to understand it solely in political terms, as it could also refer to the ‘governing’ of a car, boat, or even a kitchen. Ducrocq subsequently showed how one of his many cybernetic inventions would respond to a lit cigarette (INA 1958). In a similarly simple way, Schöffer explained how city dwellers of Paris could be ‘activated’ by the cybernetics of the TLC, effectively giving them the ‘sensation’ of being both actors and spectators of the tower’s spectacle (Schöffer 2018 [1973]: 35).

La Défense

Schöffer advocated for the implementation of the TLC tower for La Défense during the years referred to in France as ‘The Glorious Thirty’ (*les Trente Glorieuses*). This term characterises economic and societal developments between the end of the Second

World War and roughly 1975, when France's urban population grew from 21.5 to 38.4 million. From the drafting of Paris's urban master plan in 1959, which affected all planning from 1960 to 1974, to the slowdown in urban renewal after the oil crisis in the early 1970s, the capital underwent an unprecedented increase in population as well as economic growth (Scicolone 2012: 21). At the same time, President de Gaulle signed the *Plan Calcul* to secure national funding for the development of French and European computing technology, so as to avoid overdependence on the US, as well as funding for La Compagnie internationale pour l'informatique (CII), which began negotiating with Siemens and Philips to form a joint European corporation, Unidata, which shipped its first computers in 1974. As an extension of this development, the new district of La Défense, it was said, was created with the intention of showing off everything 'grand' about France's post-war economy, and was a key to de Gaulle's attempt to make Paris the financial, economic, and political centre of Europe. The planning of La Défense began after the war and had begun to materialise by 1956, when de Gaulle opened the Centre des Nouvelles Industries et Technologies (CNIT), next to which the TLC was initially allocated a plot of land.

Located outside the ring road, the Boulevard Périphérique, to the west of the old centre, La Défense, without belonging administratively to the city yet part of the Île de France Region and Paris's metropolitan area, resides in the communes of Courbevoie, Nanterre, La Garenne-Colombes, and Puteaux. The site was apparently chosen for its potential for fostering 'technologically advanced solutions' deemed 'too stark a contrast' with the historic city (Scicolone 2012: 18). As part of Paris's expansion, the creation of La Défense was a large-scale undertaking that engaged all the components of a major urbanisation project of the day. The plan aimed to make La Défense, in just over 30 years, 'the biggest business centre of France' (Chabard and Picon-Lefebvre 2012: 40). It involved expanding regional traffic, creating a new university, displacing residents of the *bidonvilles* on the site, and establishing a state body to overrule decisions of three municipalities, while simultaneously also becoming fertile ground for the student and worker movement that took off at the new Nanterre campus in early May 1968. During the Glorious Thirty years, physical and social infrastructure developed significantly in France and especially in Paris, with the expansion of many state jurisdictions, thus centralising state power and focusing yet more attention on the capital. Seemingly, the many coinciding interests, commercial and governmental, converging at such a large site, did not pose a problem for de Gaulle's administration; as Paul Delouvrier, the head planner and prefect of La Défense, explained in an interview with *Paris Match* in 1967, just a year before the summer of 1968, the president had already ruled out any clash of interests by simply stating that 'everything will be decided here [in Paris]' (Heimer

1967: 42). The planners' job, it was said, was simply to make the new mega district 'more beautiful, more extensive and more human'.⁹ To Schöffer, La Défense was the ultimate site for the TLC, providing the tower with 'enormous potential' for breaking with the capital 'museum city' and 'future archaeological ruin' allowing it to 'free itself from any backward-looking and conservative mindset' (Schöffer 2018 [1973]: 95).

Participation as Planning

Michel Ragon, the influential French architectural historian and critic and a supporter of Schöffer's urban vision as well as Schöffer's friend and collaborator, included both the TLC and Schöffer's realised cybernetic tower in Liège in his 1964 'introduction to urban issues', *L'urbanisme et la cite*, as examples of 'how to do' urban projects that would 'benefit the public'. Speaking against what at the time was considered the 'authoritarian methods' which had made major urban planning projects a 'source of general discontent' in the public, Ragon argued that 'urban planning' could only be 'the expression of a collective taste, of a collective desire, if it [became] one of the consequences of citizenship'. Ragon argued that 'everyone' would have to 'participate in the study of the needs and aspirations of contemporary man' to understand his 'habitat and its extension: the city', to ultimately ensure that urban planning first and foremost would be 'a science at the service of man' (Ragon 1964: 20–21). Schöffer imagined the TLC to be a facilitator of such civic participation and writes in *La Tour Lumière Cybernétique* that when 'the public, the citizens' see the TLC on the Parisian horizon, they 'will feel increasingly invested in the behaviour of this complex, which is the result of their own behaviour'. Schöffer believed that the TLC's colours, light, and smoke would together communicate to the public in such a way that 'they will not fail to feel that they are actors as well as spectators participating in this great collective and daily ballet of the city' (Schöffer 2018 [1973]: 35). As such, Schöffer and Ragon both argued for 'participation' to sidestep the bureaucratic steps of planning and instead achieve social cohesion by other means, in Schöffer's case by extending the 'majority vote' to the urban realm and to the subconscious existence in daily life.

Yet, although Schöffer proclaimed that the TLC would benefit 'all of mankind' and 'harmonise daily life', he continuously omitted any real explanation and kept to grandiose terms. 'The tower will certainly not be an end', Schöffer wrote in *La Tour Lumière Cybernétique*, exploring the project's aim, 'but an example and a beginning'. He explained how he saw the TLC as 'a detonator opening the way to other achievements on other scales', and how it would be able 'to weave ever closer links between people and life with a view to their greatest success, that is to say their greatest happiness' (Schöffer 2018 [1973]: 5). Schöffer persistently oscillated between describing the

tower's tasks rather practically and its potential in very broad, mystifying terms. At one point, he suggested that 'occasionally, [the tower] will be able to inform the public of the evolution of important individual or collective actions such as referendums, elections, sports competitions, technical and scientific achievements, etc., and announce their results' (Schöffler 2018 [1973]: 35). Architectural historian Arnaud Pierre has argued that we can perhaps simply understand the 'harmonisation of daily life' as a promise to optimise infrastructural tasks such as regulating traffic more smoothly by relying on urban data (Pierre 2011: 48–50). For Schöffler, there seems to have been no contradiction in declaring the TLC 'a system of openness' that would 'attempt to transcend the masses' and at the same time maintaining its political neutrality. The aim, he stressed 'is purely and simply social — cybernetics is not a tool, it is a concept, it takes into account the opinion of everyone'; as such, he believed that the public could constantly intervene in and challenge the status quo, as all information would be 'democratically quantified' by the tower. Schöffler further explained this idea when he was interviewed by the French journal *Cree* in 1971 in relation to what was believed to be the imminent construction of the TLC. He stressed that the goals of cybernetics could never be 'subordinated to attempts to take over any political system for the purpose of exploitation and directed mediocrity of the masses'. When asked about the possible dangers of gathering large amounts of data and centralising them, he replied dismissively that 'you can cut bread with a knife, but you can also kill someone' (Bonnemazou, Bertin, and Négréanu 1971).

In another interview from 1971, art historian Philippe Sers asked Schöffler to reflect on the difference between the TLC and Vladimir Tatlin's unrealised *Monument to the Third International* of 1919: the 400-metre tower that was intended to house lectures and meetings, particularly executive meetings, as well as an information centre for issuing news bulletins and for broadcasting manifestos via telegraph, radio, and loudspeaker, all during 'multiple revolutions a month'. Schöffler simply replied that the difference between his tower and Tatlin's was that his was 'cybernetic, not political'. 'The emission of political slogans, which could be justified at [Tatlin's] time, is absent [in the TLC], because I believe that today political problems are outdated'. Instead, Schöffler deemed the tower capable of creating 'osmosis' between the various political and social conceptions that currently 'divide the continent'. 'On the other hand', Schöffler stated, 'the cybernetic infrastructure of the tower will make it possible to create a bridge between the various more or less antagonistic groups, and will be able to intervene in the future supranational organisations in Europe'. Schöffler denied 'any similarity with Tatlin's concerns', contrasting the mere three parameters of Tatlin's tower to the TLC's '5000', stressing how the tower could become 'an element of

regulation and control of many urban or territorial functions (traffic, communications, television, radio, P.T.T., administration, hospital services, etc.)' (Sers 1971: 65).

Instead, as Schöffer, explained to the journalists at *Cree*, he saw cybernetics as a method to soften the hard edges of political debate, and while he critiqued existential 'mediocrisation' and the consumer society in general, he attributed to cybernetics, as opposed to political engagement, the power to heal societal ills through what he referred to as 'cybernetic self-transformation' (Bonnemazou, Bertin, and Négréanu 1971). He believed that the TLC would have made possible the same outcomes as the events of May 1968 but 'without the disorder and violence' that the riots had brought to the streets of Paris; 'only cybernetics, in the current state of our knowledge', he said, 'could perfect this action of government, in the broadest sense of the term' (Schöffer 2018 [1969]: 196–197).

Cybernetic Participation

Architectural historian Nicola Pezolet has argued that Schöffer's 'distinctively technoutopian emphasis on spatial fluidity and free participation', which he consistently omitted to define any further throughout his work, can be seen as 'directly concomitant with corporate and government efforts to promote discipline, cleanliness, self-regulation and normalization' in both the individual and the body politic in France during post-war reconstruction (Pezolet 2018: 127). This idea suggests that the tower's potential to exercise control over La Défense by collecting all its infrastructural data played a part not only in the attention given to the tower but also in De Gaulle's quest for 'public participation', which his administration considered the 'third solution' after communism and capitalism and 'the new social order of the day' (Monseigne 2009: 36).

To avoid further social conflict, public participation had risen to the top of the French agenda as a means to create better working conditions and '[empower] people' in their private lives, particularly in education, work, and community affairs (Rudolph 2015: 149). In urban planning, a similar development fostered a growing attention to the professed 'subjectivity of inhabitants',¹⁰ perhaps most especially in the *grands ensembles*, where participating in the organisation of daily life had become almost a requirement for living there (Cupers 2014: 284). Architectural historian Łukasz Stanek has suggested that such demands for research into urban space likely resulted from French reformist attempts to 'move beyond the technocratic and centralized urbanism' of the immediate post-war period (Stanek 2008: 60). Art historian Claire Bishop, borrowing from sociologist Alain Touraine, has urged that the 'various resonances of participation' be kept in mind when considering de Gaulle's version of 'dependent participation', since participation was thought to hold democratic and radical value not

only for the Left but across the political spectrum (Bishop 2012: 79). Media historian Dominique Trudel, in reference to architectural historian Larry Busbea's analysis of the TLC, has further argued that, within de Gaullist politics, Schöffer's tower for La Défense could serve a timely purpose by managing or sublimating social crises, much in line with Pompidou's slogan for the 1969 election, 'change in continuity', while at the same time evoking precisely the conception of social transformation inherent in the proposal for the TLC (Trudel 2017: 54).

Ultimately, Schöffer's architecture was confidently devoid of any self-planning or self-determinacy in the design on an individual scale, compared to canonised participatory projects in the 1960s and 1970s that were often carried out by figures from outside of the established system, free from economic demands while offering the public a bottom-up and self-realising approach (Jones 2005: 131–132). The participatory element in Schöffer's project instead mostly consisted of the process by which a continuous stream of feedback would function as a correcting mechanism for society, making any direct participation redundant, if not obsolete, by the synthesising mechanism he proposed in the TLC. Yet if we follow the critique of Schöffer's work by the American art critic Rosalind Krauss, the participatory element in Schöffer's work is perhaps essentially what remains when we look past its technological features. In *Passages in Modern Sculpture* (1977), Krauss laconically states that even if 'Schöffer (and the new tendency sculptures) implants the sculpture with sophisticated devices to give one the sense that its animation has been motivated by some aspect of the sculpture's environment', in practice they achieved something similar to what the artist Alexander Calder, credited with inventing mobile sculptures in the 1930s, was able to produce 'using a far less elaborate technology' (Krauss 1977: 213).

We see a similar way of using participation to set a project into motion in *Kyldex 1*, or '*plastic manifestation*', as Schöffer liked to call the opera he created for the Staatsoper Hamburg in 1973. Here each member of the audience was equipped with a small bag containing five different signs to be used to interfere with the opera's twelve parts (**Figure 4**). A red circle meant *stop*, a green triangle *faster*, a blue diamond *slower*, a yellow triangle *repeat*, and a white square *explain* (Lonchamp 1973).

The setup of the opera was technically elaborate, made possible by the recent computerisation of the stage in Hamburg. Schöffer integrated excerpts from German television in real time; two 'eidophores' (projection screens) enabled him to capture images of the audience or dancers and project them onto a backdrop of a large screen, as well as remotely controlling his cybernetic sculptures on stage.¹¹ Although the audience was allegedly very active, its choices were not always respected; Schöffer himself or one of his assistants decided for the most part which lights to turn on and how to arrange the dancers on stage (Ligier and Triclot 2008: 8). Instead of letting the public choose



Figure 4: The participating *Kyldex* audience recorded on film during a performance at Hamburg Staatsoper in 1973. Screenshot of video *Kyldex 1: Kybernetisch-luminodynamisches Experiment* von Nicolas Schöffer, Pierre Henry und Alvin Nikolais, Hamburgische Staatsoper (Feb. 1973), first part, on Eleonore Delavandeyra's [Eléonore de Lavandeyra Schöffer's] Youtube channel, https://www.youtube.com/watch?v=yvw_FVxZwsc, published Dec. 6, 2016.

the course of the opera, as they were led to believe, Schöffer relied on their participation to facilitate data in the same way as he did for the TLC. Ultimately, Schöffer's focus was not on the program's handling of data, but rather on the action of receiving and transmitting information gathered from the public. While one could argue that the opera or tower's blend of coloured lights formed an 'ambient spectacle', an expression Schöffer often used to describe his creations, the elaborate cybernetic framework behind the program for the tower does suggest an intentional use of information. Yet, since Schöffer's programme for the TLC did not treat the data in a way intelligible to its users or the inhabitants of Paris, communication cannot have been his main 'message', either. We can see this in the beginning of both *La Tour Lumière Cybernétique* and *La Ville Cybernétique*, where Schöffer treats the tower's indeterminacy as its defining feature; 'the rules imposed by the program can be interpreted as the "reason" for the Tower', while the random coefficients, which he compares to its 'fantasy' or 'mood', will make it 'unpredictable and non-repetitive' (Schöffer 2018 [1973]: 112). This suggests Schöffer regarded the urban data that the tower's participation with Paris facilitated to be too predictable to maintain the 'undetermined nature' of the tower. However, a closer look at the mathematical description of the TLC and the equations Schöffer provided reveal that the continuous random treatment of data would likely have created a stagnant blend of colours, lights, and rotating mirrors, precisely what Schöffer sought to avoid (Stener Jørgensen and Laplante-Anfossi 2022). It seems it was the continuous process of participation rather than the outcome of it that would have kept the tower lit up.

Ultimately, this kind of ‘cybernetic participation’ rendered the tower redundant. And as Dominique Trudel has observed, a tower shy of conflict — hiding behind smoke bombs once it became ‘oversaturated’ with information — suddenly seemed useless at a time increasingly marked by environmental, economic, and social crises. In a world where ‘there is no good forecast’, the tower, whose purpose was to ‘accompany developments in a self-regulating perspective’, Trudel explains, was ‘completely unsuited’ to the new challenges and uncertainties of the early 1970s (Trudel 2017).

Conclusion

Later in 1985, when summing up his life’s work and mission, Schöffer said that his desire to ‘program society towards a more receptive and participatory future’ was, and had always been, the main part of his urban project (Schöffer 1985: 66). By relying on cybernetics as his ideological foundation and arguing for the creation of a feedback loop between any urban system and a cybernetic tower, Schöffer essentially framed participation as a form of information collection. With the TLC tower, we could say, he proposed to construct a consensus-making mechanism, one which, without directly involving the public yet by continuously using its data, he claimed would keep the city in a ‘balanced and equilibrrious state’. By looking at his projects from the perspective of the ubiquitous digitalisation of the urban realm today, it could be argued that the ‘participatory future’ Schöffer proposed with the TLC would have entailed an indirect version of participation, which, instead of fostering self-determinacy or proposing a political agenda, focused on the extraction as well as abstraction of information; and we might instead call this ‘cybernetic participation’. Ultimately, it seems that the information the TLC would have extracted from Paris and La Défense as ‘participation’ would only have served the purpose of feeding the tower’s participatory scheme; Schöffer could have relied on *any* audience’s reaction, any city’s data, or any volume of data, as long as it served the continuous operation of his artistic project. The only possible way to determine the meaning of the TLC’s colourful spectacle and the infrastructural information it might represent would be to disentangle the algorithm’s treatment of the originally received data.

Instead, today we may consider the TLC’s treatment of massive amounts of information as a timely visible rendering of the invisible. Whether intentionally or not, with his work Schöffer shows us that we cannot choose whether to ‘participate’ or not; today, we are always embedded in the larger context of a society that is based on the constant and ubiquitous sharing of data. In this sense, Schöffer’s attention to everyday urban data and his apolitical stance of and belief in harmonising everyday life seems eerily familiar — and perhaps not so techno-utopian, after all (Schöffer 2018 [1973]: 59).

Notes

- ¹ 'Naturally, in the event of an exceptional event, happy or unhappy, or if the city's excitement threshold has been exceeded, a no less exceptional action parameter will intervene: the disappearance of the Tower in a cloud of smoke emitted by smoke bombs distributed through its framework and controlled electrically' (Schöffer 1973/2018: 34). All translations by the author.
- ² *Antenne 2*, 15 December 1971. La tour cybernétique de Nicolas Schöffer. *Vingt quatre heures sur la deux* (00:11:20, Numéro de notice: CAF97060597).
- ³ For a full description of the abandonment of the project, see Trudel (2017).
- ⁴ The translation was intended to be carried out by art historians Philip R. Denny and Joshua Barone, together with Schöffer's widow, Eléonore de Lavandeyra Schöffer. See <http://www.grahamfoundation.org/grantees/5903-the-cybernetic-city-la-ville-cybernetique%23>.
- ⁵ In a 1971 interview, Schöffer explained that the inspiration for the tower's light show came from the spectacle of light emanating from the Eiffel Tower every evening, which he witnessed as a young man just arrived in Paris in 1936 (Sers 1971: 67).
- ⁶ 'Inside the framework, 14 curved mirrors are distributed at different heights and at varying distances from the theoretical central axis of the sculpture. Between the 200 horizontal arms that extend parallel to the structure in four orthogonal directions, 114 vertical rotating axes are fixed, driven by electric motors. On these axes 263 mirrors of different sizes are fixed, the largest of which had a surface of 150 m². The motors driving these 114 axes have different speeds and are divided into several groups, distinguishing between slow, medium, and fast. For the lights attached to the frame, there would be 2,085 electronic flashes, 60 of which would be high-powered and one laser flash of 10 megawatts, on the one hand, and 2,250 medium-powered spotlights equipped with coloured devices, 40 marine spotlights projecting beams of two kilometres, some of which are on the top to extend the height of the tower at night, and 24 lasers whose rays are reflected by the fixed and rotating mirrors, make up the tower's enormous light battery. Together, the rotating mirrors and the various light sources total the 4,664 action parameters of the Tower's cybernetic control and regulation system' (Schöffer 2018 [1969]: 26).
- ⁷ Schöffer wanted to express the change in sentiment in the French Parliament, when politicians would be debating.
- ⁸ In 1969, the tower for La Défense was featured on the cover of *Paris Match*, France's all time best-selling weekly news magazine. It was presented as a prospective project, ready to be displayed to the Parisian public in the near future. It was also presented, although without any introduction to the term, as a thoroughly 'cybernetic "mobile" dazzling with flashes of lightning and polychrome flashes following a rhythm given to a computer by hygrometers, thermometers, photoelectric cells, anemometers, and microphones' (*Paris Match* 1967: 5–6). In *L'Express* the year before, the tower had similarly been described simply as having a 'brain' and its structure as 'the skeleton of this living being' with the 'computer placed at the basement that receives and synthesizes an amazing variety of information'.
- ⁹ See *Les grands travaux de Paris et La Défense en 1966*, Archive INA, INA Société on Youtube., <https://www.youtube.com/watch?v=uS34TBI2ygk> (00:00:54–00:00:58).
- ¹⁰ The group around Henri Lefebvre contributed both to the redefinition and revaluation of modernist housing by investigating the everyday practices of the inhabitants of Le Corbusier's Pessac neighborhood and his Unité housing block (Stanek 2008: 60).
- ¹¹ See *Kyldex 1: Kybernetisch-luminodynamisches Experiment von Nicolas Schöffer, Pierre Henry und Alvin Nikolais* Hamburgische Staatsoper (Feb. 1973), first part on Eleonore Delavandeyra's Youtube channel, https://www.youtube.com/watch?v=yvw_FVxZwsc.

Competing Interests

The author has no competing interests to declare.

References

- Bishop, C. 2012. *Artificial Hells: Participatory Art and the Politics of Spectatorship*. London: Verso.
- Bonnemazou, H, Bertin, P, and Négréanu, G. 1971. *Cybernétique a tout faire. Cree Journal (Créations et recherches esthétiques européennes)*.

- Bullock, N.** 2018. *Architecture d'aujourd'hui, the André Bloc Years*. In: Schmiedeknecht, T, and Peckham, A. (eds.), *Modernism and the Professional Architecture Journal*, 169–183. London: Routledge.
- Burnham, J.** 1968. *Beyond Modern Sculpture: The Effects of Science and Technology on the Sculpture of This Century*. New York: George Braziller.
- Busbea, L.** 2007. *Topologies: The Urban Utopia in France, 1960–1970*. Cambridge: The MIT Press.
- Chabard, P, and Lefebvre-Picon, V** (eds.). 2012. *La Défense: Un atlas, histoire/territoire*. Paris: Paranthèse.
- Couffignal, L.** 1963. *La cybernétique. Que sais-je?*, 638. Paris: Guilbaud.
- Cupers, K.** 2014. *The Social Project: Housing in Postwar France*. Minneapolis: University of Minnesota Press.
- Darò, C.** 2014. Nicolas Schöffer and the Cybernetic City. *AA Files*, 69: 3–11.
- Harrison, AL.** 2013. Introduction: Charting Posthuman Territory. In: Harrison, AL (ed.), *Architectural Theories of the Environment: Posthuman Territory*, 3–33. New York: Routledge.
- Heimer, X.** 1967. *Paris Match*, 951, July, 1967, p. 42.
- Holden, S.** 2019. Nicolas Schöffer's SCAM: An Aesthetic Perturbation in the Urban Field. *Leonardo*, 52(1): 60–61. DOI: https://doi.org/10.1162/leon_a_01702
- INA.** 1958. Répondez monsieur Albert Ducrocq (La cybernétique). *Répondez Monsieur X*. TV series. Nov. 11. <https://www.ina.fr/video/CPF86648196>
- INA.** 1966. *Les grands travaux de Paris et La Défense en 1966*. Archive INA, INA Société, Youtube. Dec. 30. Uploaded July 2012. <https://www.youtube.com/watch?v=uS34TBI2yjk>
- Jones, PB.** 2005. Sixty-Eight and After. In: Jones, PB, Petrescu, D, and Till, J (eds.), *Architecture and Participation*, 127–140. London: Routledge.
- Krauss, RE.** 1977. *Passages in Modern Sculpture*. New York: Viking Press.
- Krell, J.** 2020. What Is the 'Cybernetic' in the 'History of Cybernetics'? A French Case, 1968 to the Present. *History of the Human Sciences*, 33(1): 188–211. DOI: <https://doi.org/10.1177/0952695119886988>
- Le Roux, R.** 2009. L'impossible constitution d'une théorie générale des machines? La cybernétique dans la France des années 1950. In: Le Roux, R (ed.), *Revue de synthèse*, 6e série, 130(1): 5–36.
- LeBlanc, L.** 2019. Nicolas Schöffer and the Scattered Origins of Cybernetic Art History. Unpublished thesis (MA), Concordia University.
- Ligier, M, and Triclot, E.** 2008. L'art cybernétique de Nicolas Schöffer. In: *3e Congrès de la Société française d'histoire des sciences et des techniques (SFHST)*, 1–6. Paris: SFHST.
- Lonchamp, J.** 1973. À l'opéra de Hambourg Création de 'KYLDEX 1', de Nicolas Schöffer et Pierre Henry. *Le Monde*, February 15.
- Monseigne, A.** 2009. Participation, communication: Un Bain Sémantique Partagé. In: Gardère, E, and Lakel, A (eds.), *Communication et organisation: Repenser la communication dans organisations publiques*, 30–46. Bordeaux: Presses universitaires de Bordeaux.

- Orazi, M.** 2015. *Yona Friedman: The Dilution of Architecture*. Zürich: Park Books.
- Oui, M.** 2018. Nicolas Schöffer, l'art connecté à l'espace. *AMC*, 268: 106–108.
- Perriard, C.** 2003. *A Life of Creation: An Autobiography*. New York: The Monacelli Press.
- Pezolet, N.** 2018. *Reconstruction and the Synthesis of the Arts in France, 1944–1962*. New York: Routledge.
- Pierre, A.** 2011. La machine à gouverner: Art et science du cyberpouvoir selon Nicolas Schöffer. *Les cahiers du musée national d'art moderne*, 116(Summer): 41–61.
- Pierre, A.** 2018. *Nicolas Schöffer: Espace, lumière, temps*. Bruxelles: Fonds Mercator.
- Ragon, M.** 1964. *Urbanisme*. Paris: La Cité Hachette.
- Rudolph, NC.** 2015. *At Home in Postwar France*. New York: Berghahn Books.
- Schnee, F.** 2018. Towards Dematerialization: Nicolas Schöffer's Maison Spatiodynamique à Cloisons Invisibles. *Arpa Journal*, 5. <<https://arpajournal.net/towards-dematerialization/>>
- Schöffer, N.** 1985. Sonic and Visual Structures: Theory and Experiment. *Leonardo* 18(2): 59–68.
- Schöffer, N.** 1959. Intégration de l'architecture dans la sculpture: La Ville Cybernétique. *L'architecture d'aujourd'hui*.
- Schöffer, N.** 1970. *Le nouvel esprit artistique*. Paris: Denoël/Gonthier.
- Schöffer, N.** 2018 [1969]. *La ville cybernétique*. Paris: Naima. Original edition published by Denoël.
- Schöffer, N.** 2018 [1973]. *La Tour Lumière Cybernétique*. Paris: Naima. Originally published by Denoël/Gonthier.
- Scicolone, M.** 2012. *Developing Skyscraper Districts: La Défense*. Paris: UBHJ.
- Sers, P.** 1971. *Entretiens avec Nicolas Schöffer*. Paris: Pierre Belfond.
- Stanek, L.** 2008. Lessons from Nanterre. *Log*, 13/14: 59–67.
- Stener Jørgensen, N, and Laplante-Anfossi, G.** 2022. Closing the Open System: Review of Nicolas Schöffer's Algorithm for La Tour Lumière Cybernétique. *Footprint Journal*, 16(2): 135–144. DOI: <https://doi.org/10.7480/footprint.16.2.6069>
- Trudel, D.** 2017. L'abandon du projet de construction de la Tour Cybernétique de La Défense. *Les temps de médias*, 28: 235–250. DOI: <https://doi.org/10.3917/tdm.028.0235>
- Van de Walle, J.** 2008. *Roman Jakobson, Cybernetics and Information Theory*. Vienna: Folia Linguistica Historica.
- Vanel, H.** 2018. Cybernetic Bordello: Nicolas Schöffer's Aesthetic Hygiene. In: Dossin, C (ed.), *France and the Visual Arts since 1945: Remapping European Postwar and Contemporary Art*. London: Bloomsbury.

