Do Infrastructures Have Epistemologies? Studying an Open Access Infrastructure for SSH from Within

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Abstract: Over the past 30 years, digital infrastructures for open science in the social sciences and humanities (SSH) have flourished as technical means to address the supposed needs of communities of practice—for example, in research or publishing—and broader "stakeholders," such as scientific institutions and governments at large. Paraphrasing Langdon Winner, we can ask the rhetorical question of whether infrastructures have epistemologies. Indeed, SSH infrastructures are technical arrangements that embody and enforce a specific "order of knowledge." Consequently, from an epistemological point of view, one can question how this status bears on research made within SSH infrastructures: What socio-epistemic features do SSH infrastructures exhibit and in what ways do they relate to broader practices in SSH?

As coordinator of OpenEdition Lab, a small in-house team of researchers hosted by the French public infrastructure OpenEdition, I am studying the infrastructure from within. In this context, what does it mean to "study an open access infrastructure for SSH from within"? In what ways does its internal functioning, inherited from Big (natural) Science as well as engineering, shape my research agendas, fields, and methods? Reciprocally, in what ways can such an in-house lab contribute to the development of open science for SSH and beyond?

In this contribution, I will first trace an impressionist genealogy of SSH infrastructures in order to highlight the socio-epistemic features they may internally exhibit in their ideal-typical functioning. Then, in the case of OpenEdition and its Lab, I will dwell on how the original conflict between the "spontaneous epistemology" that drives the infrastructure and the socio-technical constructivism in which the Lab is rooted translates into a set of socio-epistemic frictions. Ultimately, this reflection will help me shed light on how to build a genuine "research posture" that is more akin to observant participation than to traditional participant observation and able to address the specific research topics raised by an open digital infrastructure for SSH.

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Introduction

Over the past few decades in Europe, the "reform" of the social sciences and humanities (SSH), in the face of their massification and the rise of digital networks, has been implemented through their "infrastructuration." Building upon the legitimizing discourses, policies, and infrastructures of Big (natural) Science (Cramer and Hallonsten 2020; Zurbach 2024), SSH are being politically, financially, and epistemologically reorganized around platforms, repositories, and other such services.

Since their inception, the open access, open science, and open data movements at large have also been intrinsically entwined with the development of digital infrastructures. From data repositories to digital libraries, to software development platforms and virtual machines, digital knowledge infrastructures are critical in supporting open science initiatives; facilitating access to research data and outputs, tools and methods; and fostering collaborative practices while participating in their standardization.

At the crossroads of these two trends, infrastructures for open science in SSH have flourished as technical means to address the supposed needs of communities of practice—for example, in research or publishing—as well as broader "stakeholders," such as scientific institutions and governments at large. Paraphrasing Langdon Winner's seminal science and technology studies (STS) paper titled "Do Artifacts Have Politics?" we can therefore ask the rhetorical question of whether infrastructures have epistemologies. Indeed, following Winner's typology, infrastructures as socio-technical artifacts "are instances in which the invention, design, or arrangement of a specific technical device or system becomes a way of settling an issue in a particular community" (Winner 1980, 123). As such, SSH infrastructures are "forms of order" that embody and enforce a specific "order of knowledge" (Foucault 1966)—that is, what is possible to know and for whom, as well as the (hierarchical) relationships between different bodies of knowledge and knowing subjects that are produced in this context.[1]

SSH infrastructures therefore embody and enforce specific epistemologies, or at least specific socio-epistemic features, thereby shaping the nature of the knowledge produced. Consequently, from an epistemological point of view, one can question how

1. Unless otherwise noted, all translations are my own.

this bears on research made within SSH infrastructures.[2] What socio-epistemic features do SSH infrastructures exhibit internally, and in what ways do they relate to broader socio-epistemic practices in SSH when they are deployed within it?

Infrastructures in general are highly complex assemblages of people, technical systems, standards, places, policies, and practices (Mounier and Dumas Primbault 2023). Fragile and complex as they are, the infrastructures that support open science for SSH need careful scrutiny on the part of researchers, engineers, and practitioners. Many have opened in-house "labs" or research and development (R&D) departments, straddling academic research and engineering, either to help with their development by innovating from within infrastructures or to conduct fundamental research on the specific issues they are facing.

OpenEdition is a French public infrastructure, supported by four national research institutions, and dedicated to scholarly communication in SSH. It runs, maintains, and develops four platforms—Journals, Books, Hypotheses, and Calenda—that host and circulate, respectively, scientific journals, book collection, scientific blogs, and scientific events, all in open access. In the course of its history and gradual institutionalization, a small in-house R&D department *for* open science—OpenEdition Lab—was created. Since 2023, as the new coordinator of this lab, I have been steering its scientific activity towards fundamental research *on* "open science."

As an infrastructure, OpenEdition strives to fulfill its responsibilities in supporting scholarly communication in a silent, stable, and efficient manner, thereby endeavoring to be "visible [only] upon breakdown" (Star and Ruhleder 1996), as an ideal-typical—or rational-technical—infrastructure should.

Yet, behind this appearance of technical rationality, infrastructures for SSH, as eminently fragile assemblages, are put in tension by the values and value conflicts that govern their dynamics and can either give life to the infrastructure or jeopardize it (Cohoon 2024).[3] Indeed, while it was institutionalized, OpenEdition is not itself a research institution. Although it is officially a "support *and* research unit," the scientific policies of its backing institutions do not intend it as a place for academic research. Furthermore, it is not an institution: It has no legal personality, its rather short history is punctuated

2. Infrastructures also shape the research they make possible, such as by researchers using their services, but this perspective is beyond the scope of the present article. Usage analysis, which is one of OpenEdition Lab's research areas, requires specific methods and tools (Faïta 2025; Aabid 2025).

3. This can be said about all infrastructures, and, here, SSH act as a magnifying glass on cross-cutting socio-epistemic features and shed light on issues shared with other disciplines, even in science, technology, engineering, and mathematics (STEM). Rather than building on the canonical distinctions that usually serve to separate SSH from STEM, such as "an emphasis on perspectivity (as opposed to objectivity in the sciences), verbality (as opposed to reliance on models), or historicity (as opposed to systemic integration) of contributions to discourses in these disciplines" (Knöchelmann 2019, 2; see also Arthur and Hearn 2024, 47–48), here I will focus on specific cross-cutting epistemic features. Not only does it show the actual porosity between SSH and STEM—supporting the claim that SSH magnify broader issues—but it will also highlight the pervasiveness of some epistemic features, such as in the datafication of SSH or the becoming-engineering of research.

with multiple reorganizations and rebranding, half of its staff are contract workers with a turnover of about three years, and it is seldom recognized as a public infrastructure by most of its users, notably its readership. Consequently, studying OpenEdition requires adopting a socio-technical constructivist stance. But the ideal-typical functioning of the infrastructure, mostly inherited from Big Science as well as (social) engineering, may compete or conflict with the socio-technical constructivist premise that grounds the research program of its Lab.

In this context, what does it mean to "study an open access infrastructure for SSH from within"? In what ways does its *internal functioning* shape research agendas, fields, and methods for researchers within?

Although, by a sort of dialectical reasoning, we will return to the individual agents that make up the infrastructure in the conclusion, this contribution is first and foremost concerned with infrastructures as entities rather than as a collective of actors animated by "moral economies" (Daston 1995). It is an attempt at making intelligible a sum of normative pressures that have been and continue to be exerted on my research activity within the infrastructure and on the infrastructure. These normative pressures emanate from its internal functioning and result in a field of constraints that is difficult to escape without incurring costs or penalties, thereby generating frictions. While research is always undertaken under such a system of constraints, there are conditions of felicity for said system to be productive, and I try to show that the frictions generated by the normative pressures exerted on a researcher studying an infrastructure from within can be turned into methodological opportunities. This contribution is a reflexive essay of auto-ethnographic nature, preliminary to proper ethnographic research based on controlled research material (interviews, framed observations, archives, institutional communication, etc.). Thus, I offer here general explanations of my research situation based on observations "in the wild"—interactions, readings, and work in progress that eventually serve to ground an ethnographic methodology.

First, drawing on Louis Althusser's notion of "spontaneous philosophy," I will trace an impressionist genealogy of SSH infrastructures in order to highlight the socio-epistemic features they may exhibit in their ideal-typical functioning. Then, in the case of OpenEdition and its Lab, I will dwell on how the original conflict between the "spontaneous epistemology" that drives the infrastructure and the socio-technical constructivism in which the Lab is rooted translates into frictions between professional cultures, between modes of governance, and between fundamental and applied research. Ultimately, this reflection will help me shed light on how to build a genuine "research posture" more akin to observant participation than to traditional participant observation and able to address the specific research topics raised by an open digital infrastructure for SSH by turning such a professional environment into a "research field."

1. SSH Infrastructures at an Epistemological Crossroads

In 1967 to 1968, French Marxist Louis Althusser held at the École normale supérieure in Paris a philosophy course dedicated to scientists. In a five-lecture-long introduction to the course later published in 1974, Althusser detailed a concept he dubbed the "spontaneous philosophy of scholars [*philosophie spontanée des savants*]" (Althusser 1974). According to him, scientists ponder philosophical issues related to their practice in the very course of their scientific activity. In doing so, they produce a discourse that is said to be philosophical in that it proposes an interpretation of their *praxis*. This philosophy is deemed spontaneous only insofar as it seems to stem directly—one would say "naturally"—from said praxis. Yet, for Althusser, the "spontaneous philosophy of scholars" is in no way spontaneous—as in immediate, unbiased, or natural—but rather results from forgotten or hidden origins, from further acculturation or socialization in specific contexts of transmission, and is embedded in a broader practical ideology, or rationality. Because these origins, contexts, and rationality were eschewed, the "spontaneous philosophy of scholars" happens to be fraught with tensions and contradictions that Althusser aims at resolving by a form of *emendatio intellectus*.

Prolonging Langdon Winner on the epistemological side, the same can be said, *mutatis mutandis*, of SSH infrastructures *taken as full-fledged entities* endowed with their own individuality and agency. Indeed, as mediators—even "ecosystems"—of scholarly practices, SSH infrastructures embody and enact specific socio-epistemic features that manifest somewhat spontaneously in their development and usage: Through discursive injunctions, technical constraint, or mere nudge, they promote and foster certain practices while constraining or preventing others. In this section, a rather impressionist genealogy of French SSH infrastructures will help us sketch the lineaments of their ideal-typical socio-epistemic features, inherited at the crossroads of their origins, context, and rationality.

a. Origins: A Heritage from Cybernetics and Big Science

A first clue to trace the genealogy of French SSH infrastructures is to look to the United States. In *Code: From Information Theory to French Theory*, media historian Bernard Dionysius Geoghegan (2023) tells the prehistory of datafication in the social sciences, beginning in the interwar period in the United States with the first applications of Claude Shannon's information theory—glossed by Warren Weaver—to social science disciplines. As early as the 1930s, "robber barons' philanthropies"—notably the Macy and Rockefeller Foundations (see also Hauptmann 2024)—funded research programs, particularly in anthropology with Gregory Bateson and Margaret Mead, aimed at using

the new audiovisual media to produce material inscriptions of social phenomena, which could then be edited and analyzed to identify recurring patterns. During the war, Norbert Wiener developed the founding concepts of cybernetics around these analytical practices, notably the (in)famous "feedback loop." Within cybernetics the world thus became code and the social sciences decoding practices. The link with French social sciences was forged at the École libre des hautes études, founded in New York in 1942 and financed by the Rockefeller Foundation, which welcomed researchers in exile from Europe, notably Roman Jakobson and Claude Lévi-Strauss, whose structural anthropology owes much to this cybernetic period. After the war, around the École des hautes études en sciences sociales (EHESS), again financed by the Rockefeller Foundation, Lévi-Strauss developed a genuine data repository, the Human Relations Area Files, which stored two million index cards of ethnographic data on a global scale and was equipped with a mechanographic device for consulting it in order to decode myths, among other cultural phenomena (Plutniak 2019). Geoghegan also notes the technocratic aspect of this genealogy, whose actors all have backgrounds close to public and economic authorities, colonial administrations, or NGOs such as UNESCO. The datafied social sciences are not only tools for describing reality; they are also instruments for controlling it.

This history of the concomitant datafication and infrastructuration of (French) SSH along the lines of epistemic features borrowed from mathematics and the natural sciences is continued by the recent work of Jonathan Zurbach. His detailed history and analysis of the "discourse on infrastructures" for SSH in France shows how, from UNESCO in the 1960s to OECD in the 1990s to the European Commission in the 2000s, the institutional entrepreneurs of SSH borrowed the rhetoric of Big Science—what he calls a "practical syllogism" (Zurbach 2024, 60)—to legitimize their massification, hence their funding. Next to telescopes and particle accelerators, digital libraries and data repositories become the instruments of a "datafication of social sciences" (25) that aims at elevating SSH to a superior epistemic status. Indeed, "the defense of these 'infrastructures' for 'data' is the defense of a particular social science practice, or even a conception of science" (27), one for which the "statistical proof" is "proof *par excellence*" (757). Like Geoghegan, Zurbach highlights the ambivalence of French research infrastructures that aim both at "supporting [*soutenir*] and improving [*améliorer*] research" (31): "The tension between 'supporting' and 'improving' can be seen as a translation of the fundamental tension inherent in the process of infrastructuration. The tension of infrastructuration involves, on the one hand, codified and institutionalized traditional scientific identities and practices, which as such exert a constraint on actors, leading them to support the latter, and, on the other hand, emerging scientific identities and practices, carried by individuals or pressure groups, whose aim is to improve the traditional game, leading these actors to engage in reformative work" (754). The

infrastructure, which is shaped by, as much as it shapes, research communities and their practices, becomes the crux of a broader "reform" of SSH along the aforementioned epistemic features.

b. Context: A New Regime of Knowledge

These forgotten origins of French SSH infrastructures now have to be reappraised in their specific context: a new "regime of production, regulation, and appropriation of knowledge." This concept, forged by STS scholar Dominique Pestre, can be defined as a historical period resulting from the (relatively) stable articulation of situated scientific definitions and related issues, forms of research outputs, socio-epistemic practices, values and norms, organizations and institutions related to knowledge production, "and so much more" (Pestre 2006, 104–5).[4] A regime of knowledge, in short, is a way to understand the socio-political nature of knowledge production and use as an arrangement of, on the one hand, ways of knowing (standards of proof, forms of knowledge, an order of knowledge, a hierarchy of disciplines) and, on the other hand, a social and political order (the role of public power, forms of government, a hierarchy of values, rules of ownership, economic valorization). Because it is (relatively) stable, a regime allows for the anticipation and regulation of knowledge production through diverse means of steering, pressure, and governance of socio-epistemic practices and their outputs.

It is generally acknowledged that since the 1970s in the United States, and soon after in Europe, a new regime of knowledge has been emerging (Bonneuil and Joly 2013). From a 19th- and early 20th-century regime in which science was deemed a public good serving the progress of a welfare state—and economic power, military domination, and identity construction—a gradual transition has occurred towards a new regime, sometimes referred to as "neoliberal" or the "knowledge economy." In this new regime, with the ebb of public funding and the managerialization of research through new public management practices, the sciences become subject to market logics that promote the financialization of innovation and project-based funding, as well as competitive dynamics in the production of knowledge, underpinned by symbolic economies such as citation metrics and impact factors. In this context, where science is seen as a source of competitiveness, the advent of digital technology and the internet has helped to open up and break down a number of historical "black boxes" that used to act as mediators within the scientific field, giving rise to a set of socio-technical

4. See Lamy and Saint-Martin (2011) for a critique of the concept.

interdependencies between new components, proliferating new black boxes, and actors or stakeholders that were previously enclosed within integrated systems.

This change of regime also entailed a shift in the scientific ethos—the DECAY, or "differentialism, egoism, capitalism and advocacy" (Macfarlane 2023), of Robert Merton's CUDOS (Communalism, Universalism, Disinterestedness, Organized Skepticism).[5] Indeed, however normative or idealist, it is no wonder that Merton's sociology of the scientists is at the heart of the discussion in the first publication on "open science." In his 1985 seminal paper "Open Science and Closed Science: Tradeoffs in a Democracy," sociologist and US policy advisor Daryl E. Chubin more specifically discussed the norm of communalism—"open communication [as] an imperative for scientific integrity" (73)—and its demise in the face of new knowledge enclosures resulting from the emergence of "corporate science," itself fostered by "liberal democracy" in the 1970s and 1980s. Openness and closure become the two ends of a tradeoff: "liberal-democratic society has complicated the production, communication, and utilization of science. It has politicized scientists by discipline and by employment sector; it has caught science in a torrent of tradeoffs. Democracy has made 'openness' and 'secrecy' the subjects of policymaking and conjecture; it has forced consideration of how science can be closed by special interests and closed off to the public good" (74). In this ambit, digital knowledge infrastructures thus appeared as a technical means to rearticulate, for the benefit of their stakeholders, the redistribution of people, skills, tools, and knowledge, as well as balance the tradeoff between openness and closure (Mounier and Dumas Primbault 2023).

In the French case more specifically and building on Pestre's concept of regime, Célya Gruson-Daniel studied in what ways "the open in the sciences and the meanings associated with it provide a better understanding of the current reconfigurations of the knowledge regime with digital technologies" (Gruson-Daniel 2018, 75). Focusing on the 2015 national public consultation that preceded the parliamentary debates on the *Loi pour une République numérique* (2016), she compiled, coded, and analyzed the discourses on science held by a diversity of actors on the dedicated platform, as well as on other media and social networks. In doing so, Gruson-Daniel identified four normative "conceptions" of "the open in the sciences," ranging from the defense of past, pre-digital regimes of science (chaps. 5 and 6), to the embrace of digital networks in the service of scholarly communication (chap. 7), to the call for an "informational liberalism" grounded in free software and knowledge commons (chap. 8). She situates French public knowledge infrastructures in general—and, namely, OpenEdition—in the defense of a "civic-technoindustrial regime": a means for public research to "regain control"

5. For Bruce Macfarlane, the new regime of knowledge pushes for the "STEM-ification of the social sciences and humanities"—that is, for the adoption by SSH researchers of the epistemic culture of STEM.

over the production and circulation of knowledge for the public good through the creation of a network of public innovative infrastructures (chap. 7). Like Zurbach, Gruson-Daniel highlights that the type of SSH knowledge fostered by this regime comes under the banner of "digital humanities," even the "institutional scientific humanities" (228–35).

c. Rationality: l'agir ingénieur

Finally, besides the origins and context of SSH infrastructures, some light can be shed on the practical ideology, or rationality, that animates these infrastructures by looking at other French public infrastructures dedicated to openness: government open data repositories. Studying, as an embedded researcher, diverse *loci* of the design and development of the policies and infrastructures for government open data, Sarah Labelle highlighted how much infrastructure building was "a cardinal element of political change" (2020b, 34). A "reform" of the State is thereby endeavored by mobilizing engineering know-how as a way to transform the world in a "contraction of politics and technology" (61). This is what she calls "engineering action [*l'agir ingénieur*]": "*data policies* presuppose that subjects mobilize a model of action that considers the state of the world in terms of the engineering processes that can transform it: the relationship to the world is thought of and defined in terms of infrastructures, i.e., it is thought of as mediated. I propose the term engineering action [*l'agir ingénieur*] to designate the model of action that these subjects mobilize" (35). Yet, while the infrastructure—such as an open data repository—is acknowledged as a means to bring about political change, notably in a particular form of transparency, it is itself supposedly devoid of any political content. Somewhat paradoxically, the infrastructure would still lie outside politics and value conflicts, not only because of a certain conception of the nature of "data" but also because it merely calls for practical involvement of citizens with data, without constraining or prescribing said practice: "Engineering action is characterized by an indifference to the question of ends: it's more a question of getting people to act than of achieving a certain action. [. . .] Engineering action consists in producing and providing a framework whose plasticity favors practices, whatever they may be: it's a question of producing devices that offer a potential for action, that 'elicit practices' but absolve them of any precise objective" (39). In this rationality that eschews the prescriptive and performative powers of the infrastructures on the socio-epistemic practices and communities they mediate,[6] the embedded researcher is welcome as a colleague, yet another

6. Samuel Goëta's *Les données de la démocratie. Open data, pouvoirs et contre-pouvoirs* (2024) is typical of this rationality—see my critique in Dumas Primault (2024).

engineer whose expertise is expected to be instrumental: "I experience this expectation with a certain anxiety, because I don't know if I can live up to it. This brings us back to the position of the [embedded] researcher in the field, a position that reveals the usefulness desired [*utilité souhaitée*] by the various interlocutors" (Labelle 2020a, 81).

For some actors and commentators of open science, this becoming-engineering of scientific research is desirable and must be fostered by national and international scientific policies, including open science policies. For René Von Schomberg, a professor of STS affiliated with the Directorate General for Research and Innovation of the European Commission for 24 years (1998–2022), "The sciences have evolved over the decades post-Merton and are now intertwined with societal and industrial interests. Merton's image of science as primarily aimed at explaining or understanding natural and social phenomena has been subject to change, with many sciences adopting an engineering perspective" (Von Schomberg 2024, 16). From this perspective, open science policies can help steer scientific research along a "problem-solving" (28) path and become "societal-challenge driven mission-oriented research" revolving around a "socio-technical imaginary" such as "smart cities" (10). This instrumentalist steering of science as innovation- or policy-oriented research—or "mode 2" involving the "Quadruple Helix, including academia, industry, civil society, and public authorities" (Von Schomberg 2024)—preceded and grounded open science policies at the European level (Vanholsbeeck 2017).

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What this genealogy shows is that, at the turn of the 21st century and at the crossroads of their origins, context, and rationality, nascent SSH infrastructures, particularly in France, could then be expected to embody and enforce, in part or in whole, some of the following four socio-epistemic features:

- **A data-driven epistemology** or data-intensive conception of scientific research[7]—that is, some flavor of "the end of theory" (Anderson 2008) or "the fourth paradigm" (Hey et al. 2009), which renews the promises of the so-called Scientific Revolution, such as radical empiricism, radical inductivism, representationality of exhaustive data, and neutrality of the computation tools.[8]

7. It was observed also for British and Swedish data infrastructure: "First, it is based on a positivist philosophy of knowledge that views the social world as part of an objective external material world that exists independently from the subjects who observe it. Objective knowledge about this world is, according to this view, possible if objective scientific methods are applied and if subjective interference by observers (researchers) is kept away. Secondly, foundational epistemology tends to understand itself as the only right perspective on knowledge, denying at the same time any legitimacy to other epistemological perspectives. As such, foundational epistemology tends to ignore some of the most basic principles upon which qualitative research is founded" (Slavnic 2013).

8. This conception of science, with the development of statistics in the 17th and 18th centuries, had already pervaded the nascent SSH (Desrosières 1993) and the public sphere (Porter 1995).

- **A civic-technoindustrial regime** of knowledge production, regulation, and appropriation that strives to regain control over public scientific research by the design and development of a national network of large-scale digital infrastructures made to support, improve, and circulate scientific research.
- A practical ideology in the form of **a technical rationality**, premised on a distinction between technology and politics, thereby favoring facts over values—and generating "spontaneity"—in the governance of research infrastructures (e.g., by setting a quantitative target presumed to be free of value conflicts[9]) and in the steering of research.
- **An instrumentalist steering of research** as an innovation-oriented (R&D) or policy-oriented endeavor aligning with an engineering ethos and socio-epistemic features and practices—notably to directly and practically "impact" perceived "societal challenges" through the development of technical arrangements such as infrastructures.[10]

2. Studying an Open Access Infrastructure from Within

Evidently, the previous set of socio-epistemic features cannot be ascribed indistinctly to the functioning of all French SSH infrastructures. Rather, these features are the fertile ground on which SSH infrastructures can develop distinctive and peculiar epistemologies depending on their history, missions, and organization. Detailed ethnographies of a variety of infrastructural sites would be needed to document this diversity in practice.

Here, I dwell on the case of OpenEdition's "internal" socio-epistemic features—as opposed to "external" ones, or the ways in which it both enables and constrains the scholarly practices of its users. That is, I focus on how these socio-epistemic features, to the extent that they are manifest in the functioning of OpenEdition or not, may conflict

9. This is salient in most histories of digital knowledge infrastructures, such as in the case of the National Digital Library Program (NDLP) of the Library of Congress, documented by Marija Dalbello: "The transformative forces in the library for the duration of the NDLP (1995–2000) rallied around the statement, 'five million images in five years' as a goal of digitization. Measuring progress in quantitative terms provided a clear sense of what a successful outcome would be, and whether it has been achieved or not. In contrast to the ideological discourses of access and preservation, such a non-ideological goal is not one on which it would be possible to disagree; it was a goal that could be disengaged from any other goal that diminished negotiation between the different parts of the organization and the organizational field of librarianship" (Dalbello 2005, 414). See also Béquet (2014), Bermès (2020), and Dumas Primbault (2025) about digitization at the French national library.

10. This is echoed by the fact that in France, and in Europe more generally, open science and open data policies and infrastructures have been decried by some commentators as centralized instruments (Girard 2017; Valluy 2017; Laboulais 2023) for governing SSH towards datafication (Levain et al. 2023), economic valorization (Hagner 2018), and innovation (Ibekwe-SanJuan and Paquienséguy 2015)—instruments exogenous to the academic community and aligned with political and economic interests at odds with its epistemic values (Schöpfel 2015; Chartron and Schöpfel 2017; Chartron 2018). See also Faïta (2026) in this issue.

with research practices deployed within the infrastructure. It would also be interesting to document how they translate into platforms, services, and tools dedicated to its users and what kind of epistemic frictions are generated at the interface with outside research communities.[11] Let us also stress that OpenEdition may manifest these features *as an infrastructure*, while individual *agents* straddle these socio-epistemic features and may mobilize them—together with other, sometimes idiosyncratic features—as frames of experience or justification means in a diversity of contexts, as one does not deploy the same arguments or defend the same values either in a project management meeting or in a reading seminar.

a. Behaving Like an Institution

Founded in 1999 as Revues.org by a PhD student at Avignon Université, OpenEdition began as a grassroots effort to improve the online visibility of SSH journals. Initially described as a "federation," it gradually institutionalized over two decades. This institutionalization unfolded through (1) the progressive expansion of partnerships and funding, bringing in Centre national de la recherche scientifique (CNRS), Aix-Marseille Université (AMU), EHESS, and later support directly from the Ministry of Higher Education and Research; (2) a rebranding in 2011 to OpenEdition, reflecting a broader, international mission beyond journals to include books, event listings (Calenda), and academic blogs (Hypotheses); and (3) formal recognition as a public research infrastructure in 2016, positioning it alongside major scientific instruments such as telescopes and particle accelerators in the national roadmap. This marked a turning point as OpenEdition evolved from a decentralized network to a more structured and standardized entity. Today, despite not being a legally incorporated body, OpenEdition functions as a "joint unit" dependent on its four supporting institutions and operates under a complex governance structure in which staff are only employed by the parent institutions.[12]

This history of OpenEdition highlights the fact that the process of infrastructure building is at the same time a process of institutionalization (Zurbach 2024, 32ff.), and

11. It is to be highlighted that as an infrastructure specific to SSH, OpenEdition does support some of its users' specific epistemic practices, such as book publishing, multilingualism, and small-scale qualitative research publications. In passing, note that OpenEdition mainly prolongs, in the digital, traditional publishing dynamics such as the regular publication of peer-reviewed journal issues and books, which greatly helped structure the field of SSH publishing in France and regain control over public scientific publishing, while it also created path dependencies, notably in terms of format (Monjour 2023).
12. A more thorough oral history of OpenEdition is in the making and will be the subject of a subsequent publication.

the consequences of this process could not be more clearly stated than by Pierre Mounier, one of the founders of OpenEdition:

> As these infrastructures scale, however, they progressively enter a new dimension, moving further from the initial community-focused logic centred on a single or limited set of journals. Increasingly, infrastructural growth brings about constraints associated with human resource management, large-scale financial sustainability, technical maintenance, and user relations, as users begin to behave more as consumers than as community members. Operational streamlining, efficiency demands, rigorous oversight and, ultimately, bureaucracy, become prevalent and begin to transform the character of the infrastructure itself.
>
> More significantly, upon reaching a certain scale, these infrastructures are compelled to develop closer relationships with external entities, such as government agencies, library consortia, and large funding bodies. These institutions impose specific requirements and often introduce their own organisational culture, shaping the infrastructure in ways that may diverge from its original communal values. Consequently, these infrastructures face moral dilemmas as they struggle to balance their scholarly foundations with an administrative and technical culture that, in some respects, contradicts the very notion of community.
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> Ultimately, infrastructures initially rooted in a specific scholarly community find themselves compelled to serve multiple other communities, necessitating a gradual departure from their communitarian essence in order to fulfil these broader obligations. (Gatti et al. 2025, 28–29)

Overall, OpenEdition's case highlights the aporias of institutionalization: Increased recognition and stability come at the cost of bureaucratic complexity and limited operational independence. Furthermore, the need to conform to each institution's norms hinders autonomy, illustrating how institutional support both enables and constrains OpenEdition's operations. It also shapes its socio-epistemic features: With Gruson-Daniel (2018), we see that, as a public research infrastructure, OpenEdition finds its place in a broader network of national (and international) innovative infrastructures dedicated to regaining control over public knowledge production in a civic-technoindustrial regime, which, specifically in the French case, takes shape as a "public service mission."

Although in the process of being institutionalized—that is, supported and steered by four public research institutions—OpenEdition is not itself an institution (Tournay 2011): (1) from a historical perspective, its short history, rebranding, and multiple reorganizations attest to a continuous adaptation to an ever-moving "ecosystem" rather than a fixed point in a landscape; (2) from a legal perspective, OpenEdition has no legal

personality, which means it cannot manage its own finances or employ its own staff, nor can it be held responsible for civil or criminal infractions; (3) from the perspective of its scale, although the infrastructure staff grew from 49 to 70 over the last 10 years, the vast majority of its agents are employed on fixed-term contracts that legally cannot cumulate more than six years, leading to an important turnover rate with a mean duration of stay of little more than three years[13]; and (4) finally, from the perspective of its public recognition, surveys and interviews led by members of the Lab with the research and publishing communities showed that only backend users—that is, editors and publishers—unequivocally and explicitly recognize OpenEdition as a public infrastructure and know about its missions and functioning. Other users, in an answer to a survey or a response to an interview on the matter, frequently mistake it for other platforms—either CAIRN or Persée—or even with open access at large.[14]

Yet, despite this state of affairs, one way for OpenEdition to accommodate all the tensions and pressures exerted by its many stakeholders at the crossroads of scientific institutions and policies, scholarly communities, other infrastructures, and its own staff is to behave like an institution. Indeed, only by setting itself apart from the vagaries of time and outside the socio-political mundanities of worldly affairs can OpenEdition exhibit the ideal-typical properties of an infrastructure—that is, to perform its technical function in a transparent and efficient manner, becoming "visible [only] upon breakdown" (Star and Ruhleder 1996).[15] This points to one of the socio-epistemic features manifested by the infrastructure: Its functioning is grounded in a radical distinction between technology and politics, or between facts and values, and thus between workers and individuals.[16]

b. Epistemic Frictions

In the course of OpenEdition's history, and under the aegis of its founder and first director, Marin Dacos, a research service was founded within the infrastructure: OpenEdition Lab. During its first phase (2011–2018), OpenEdition Lab was intended as a

13. I thank Thomas Forte for these statistics. Furthermore, 50 fixed-term contract workers left OpenEdition since 2017 ("Les précaires d'OpenEdition," internal documentation).
14. See Faïta (2025).
15. Quite tellingly regarding its technical rationality, "breakdown" in the history of OpenEdition is to be understood in a strictly technical sense, not encompassing a strike, for example. Such was the case in 2019 when a general assembly of OpenEdition's agents voted for supporting an ongoing social struggle against a pensions reform by blocking access to the platforms for 24 hours. This collegial action led to a protracted conflict with all backing institutions.
16. As an example, it is worth noting that the issue of bots scraping the open access content hosted by the infrastructure to train large language models (LLMs) was seemingly resolved in technical rationality as the system administrators decided to ban them after one behaved too aggressively to the point of taking down one platform.

space to design, prototype, and implement data-scientific tools, such as for reference detection, resource recommendation, named entity recognition, or log analysis:

> OpenEdition Lab is the research, development, and innovation cell of Cléo,[17] which proposes to develop and experiment with a range of tools exploiting the possibilities offered by digital technology for collaboration and access to scientific information. It is a space for research and innovation around the search for information in these different deposits [*gisement*]: books, journal articles, research notebooks, and scientific events.
>
> The aim is to enable the deployment of innovative services, through new devices facilitating the dissemination of scientific information, as well as the implementation of research and development programs aimed at interlinking all the documentary resources disseminated (articles, chapters, etc.).[18]

Initially funded by two Google grants for the digital humanities, OpenEdition Lab was populated with engineers and developers, as well as PhDs and postdocs in information technology (IT), data science, and software engineering. As clearly stated in this excerpt, this innovation-oriented R&D service is grounded in a form of technological determinism for which technology comes first and "offers possibilities" that researchers and engineers have to seize in order to deploy services. In this (spontaneous) epistemology, "scientific information" (books, articles, notebooks) becomes the natural resources that need to be mined. Embedded in a broader *agir ingénieur* that pervades the whole infrastructure, we can therefore situate the first phase of OpenEdition Lab at the crossroads of the "institutional scientific humanities," an instrumentalist steering of research, and a somewhat data-oriented conception of science.

In 2023, after a few years of inactivity, OpenEdition Lab began a second phase with an emphasis on fundamental scientific research. Since then, its aim has been to grasp and document the socio-technical dynamics of open science for SSH in all their depths and "thickness": from individual practices to infrastructures to open science policies and philosophies of the "open" more broadly. At the intersection between STS, library and information science, and data sciences, this second phase of the Lab focuses on "research on research" and, among other issues, questions the role played by digital technology—software, platforms, infrastructures, code—in the contemporary transformation of research practices, tools, and policies. As such, although it recognizes the prescriptive and performative powers of technology, it

17. Centre pour l'édition électronique ouverte ("*Center for open electronic publishing*"), the institutional denomination of OpenEdition as a support unit.

18. Early presentation of the Lab, dated around 2014. See also https://lab.hypotheses.org/historique.

cannot yield to a technological determinism. Rather, it is premised on a socio-technical constructivism that (1) does not sharply distinguish technology from politics, nor favors facts over values, but posits that artifacts do have politics and (2) does not conceive of technical development—such as an infrastructure—as a merely "natural" or "spontaneous" endeavor, but rather claims that it results from processes of socio-political construction—even recursive processes since said technology has an effect on socio-political dynamics.

Consequently, to the complex equation of the four epistemic features that we identified in the first part and detailed in the case of OpenEdition, we must add a fifth term: a socio-technical constructivist premise. This premise is highlighted since the beginning of the new phase of the Lab but is nonetheless shared by other actors—both individuals and organizations—across and beyond the infrastructure. While behaving like an institution partly allowed the infrastructure to accommodate some tensions, year in, year out, the irruption of this fifth term generates epistemic frictions wherever constraints collide and pressures build up.[19] These epistemic frictions, which can either be made productive or result in deadlocks, may manifest as:

- Frictions between professional cultures: for example, between the symbolic economy of scholarly authorship that requires individuals to be recognized as knowledge producers in a broader community—and, more largely, OpenEdition Lab as a fundamental research team rather than the R&D branch of the unit—and the corporate communication strategy for which the infrastructure speaks of in its own depersonalized and disembodied voice.
- Frictions between modes of governance: notably between forms of collegiality or collective decision-making necessary for the social construction of facts, horizontal management that relies on third-party actors such as consulting firms to externalize the processes if not the responsibility in collective decision-making, and a vertical hierarchy emanating from more powerful stakeholders in a dissymmetric ecosystem.
- Frictions between facts and values: or, rather, muffled value conflicts that cannot find a space to be debated and become productive, for they are usually discredited as personal opinions and eschewed in technical rationality by supposed facts.

19. Rather than Merton's "sociological ambivalence," I prefer Paul N. Edwards's metaphor of "science friction": "Friction resists and impedes. At every interface between two surfaces, friction consumes energy, produces heat, and wears down moving parts. [. . .] In social systems, data friction consumes energy and produces turbulence and heat—that is, conflicts, disagreements, and inexact, unruly processes" (Edwards et al. 2011, 669).

c. The Becoming-Engineering of Research

One last specific and prevailing friction can be found in the tension between fundamental research as a primarily descriptive practice, on the one hand, and innovation- or policy-oriented research and development as a normative endeavor, on the other. Although no sharp distinction can definitively be made between fundamental and applied research[20]—since the "mere" description of a phenomenon may be intended to have some effective and concrete consequences on it—practices may radically differ depending on their final cause: whether to better understand the world by producing knowledge about it or to produce effective action that will have material consequences on it. As we have seen with Zurbach, this tension is particularly salient in the case of infrastructures: "The tension between "supporting" and "improving" [research] can be seen as a translation of the fundamental tension inherent in the process of infrastructuration" (2024, 754).

Indeed, many other infrastructures—either public or private, in France and abroad—host R&D, innovation, data, or policy "labs" dedicated to applied research in service of the infrastructure.[21] When they do not have the luxury of an in-house research team, they may have recourse to dedicated service providers such as cooperative *startups*, consulting firms, or software companies.[22] Although this would need a more thorough inquiry, much of the spontaneous epistemology of OpenEdition Lab in its first phase can be discerned, *mutatis mutandis*, in the discourse and dynamics of other such in-house R&D labs. During workshops, conferences, and encounters, I have witnessed a recurring pattern of technological determinism—which prioritizes existing state-of-the-art technical devices over actual practices, sometimes even claiming to meet "needs" that do not exist yet—accompanied by a normative discourse about what scientific research should be; what "good practices" may support this conception of science; or what scientists, as individuals, must become in this context.

This spontaneous epistemology for a technology-driven applied research—largely amplified by a knowledge regime grounded in the financialization of innovation, notably through project funding and management—enters in friction with fundamental research. And it is all the more salient when said fundamental research is premised on a critical stance on technology. Possible frictions may run along the following lines:

20. Historically, see Shapin (2008).
21. "Lab" is a term borrowed from STEM, more specifically chemistry and medicine, which literally means the place where one *elaborates* a product—for example, the synthesizing of a chemical compound. Note that the term "Etalab" (literally "Labstate") was given to the French administration responsible, among other things, for the opening of government data (Labelle 2020a).
22. The significant presence of such actors in the ambit of open science, compared to other objects of research, adds a fourth term to Aldrin et al. (2022)'s "triangular ecosystem" composed of researchees, research institutions, and peers.

- Objects—frictions between the technical-rational demands of an infrastructure and "thicker," yet infrastructure-specific, fundamental research issues such as the discoverability of open access content or cognitive justice for a fair open science.
- Scope—frictions between the role assigned to such an in-house Lab in the development of the infrastructure, reduced to prototyping mere technical devices, and the role it could have in opening spaces to debate the values of the infrastructure or the meaning of open science.
- Methods—frictions between rather formatted methods tailored for needs and impact assessments (e.g., UX/UI, A/B testing, user persona, cost-benefit analysis, SWOT analysis, indicators and metrics) and a host of both qualitative and quantitative methods for SSH (e.g., observation, participant observation, interviews, probes, archival research, surveys, network analysis).
- Temporality and Management—frictions between the longer timescales of open-ended and exploratory fundamental research and the tight planification of applied research, teleologically oriented towards concrete deliverables.

*

In this complex context due to the infrastructure's spontaneous epistemology, itself amplified by a broader regime of knowledge, the research activities of OpenEdition Lab come under a set of epistemic pressures that cause frictions at certain interfaces both within and outside OpenEdition. Two main frictions have to be highlighted here: first, between the technical rationality of the infrastructure's ideal-typical functioning and the socio-technical constructivist premise that grounds the Lab's epistemology as highlighted above; and, second, between *l'agir ingénieur* that drives innovation-oriented research and open-ended, exploratory fundamental research.

Slightly expanding on this second tension to conclude this part, it is worth going back to historian of science Paul A. David's seminal paper on "The Historical Origins of 'Open Science.'" Adopting a decidedly presentist posture in 1991 (later enriched in 2008), he acknowledges the recent appearance of knowledge enclosures in R&D—"commodification of knowledge"—as opposed to what he then dubbed "open science." For David—as much as for Daryl Chubin—"open science" does not merely amount to opening the access to publications and data but is, in contrast with private R&D, fundamental research funded by public patronage. It is therefore a "balancing act" of public policies between these two "systems of knowledge":

> Considered at the macro-level, "open science" and commercially oriented R&D based upon proprietary information together form a complementary pair of

> institutionally distinct sub-systems. The public policy challenge that needs to be faced, consequently, is to keep the two sub-systems in proper productive balance, so that the special capabilities of each may amplify the productivity of the other. But the former of these sub-systems, being based on cooperative behavior of researchers whose work is dependent on public and private patronage for support, is the more fragile of the pair; and more vulnerable to being undermined by the incursion of information disclosure restrictions motivated by the goal of privately appropriating rents from possession of new scientific and technical information. (David 2008, 4)

While dividing lines have shifted since then—as there are private firms that produce open knowledge while publicly funded research can be privatized and commercialized—fundamental research, or "open science" in David's terms, still seems to be the poor relation of scientific policies and infrastructures, especially in SSH.

3. Towards Observant Participation

Scientific policy, economic model, epistemological paradigm, research reform, scholarly ethos, ethics of inclusion, governance model, infrastructure, ecosystem . . . "open science" is a complex, multi-faceted, and sometimes contradictory phenomenon—a boundary object that is difficult to grasp, the object of various struggles in tension between numerous arenas. In addition to being polymorphic, it is a moving object, the subject of a new publication, a new initiative or a new research or development project every day.

In the midst of this messiness to be cultivated, the discourses on open science itself take many forms and involve a wide range of actors: SSH researchers, researchers in the natural sciences, engineers, consulting firms, think tanks, institutions, administrators, non-governmental organizations, etc. In this context, symptomatic of a form of research liberalization and science steering, many innovation-oriented tools and infrastructure projects are emerging, as are policy-oriented discourses.

So as not to promote or "celebrate" open science (as heard at a conference), what methods should be used to study open science from a critical perspective? What epistemological and ethical precautions should we take to maintain this critical distance as much as protect our researchees? More fundamentally still, for whom and for what purposes do we undertake research on open science? This last part ventures a few elements for the construction of a specific situated, reflexive, and critical research posture to study an open infrastructure for SSH from within.

a. Being Inside and Outside Openness

A host of different actors, individuals and organizations, produce discourses about open science. That said, few among them take it as the object of a critically informed fundamental research. For Nathanael Tkacz, the only way to distinguish oneself from institutional entrepreneurs, promoters of the open, or compliance auditors, is to "leave the rhetoric of open behind":

> There is a need to look more closely at the specific projects that operate under its name—at their details, emergent relations, consistencies, modes of organising and stabilising, points of difference, and forms of exclusion and inclusion. If we wish to understand the divergent political realities of things described as open, and to make visible their distributions of agency and organising forces, we cannot "go native," as a young, anthropologically-minded Bruno Latour once wrote, meaning that we cannot adopt the language used in the practices we wish to study. To describe the political organisation of all things open requires leaving the rhetoric of open behind. (Tkacz 2021, 404)

Yet there is an urgent need precisely to fully grasp "the language used in the practices we wish to study" to understand not only what it means but in what ways it articulates with said practices as much as with "*dispositifs* and events, artefacts and experiences" (Labelle 2020b, 17) and how this assemblage constitutes a genuine policy or infrastructure. This, I believe, and more particularly in my own case, implies to somewhat concur with the rhetoric of open, at least temporarily or alternately.

This is precisely what Labelle aimed at as an embedded researcher constantly reappropriating her fieldwork, the concepts, and the people involved. The "permanent shuttling back-and-forth between the space of inquiry and the constitution of the research object" (Labelle 2020b, 19) is what she calls "multipositionality":

> A double constraint arises: you have to be spontaneous and free, but at the same time contribute (actively) to getting the message across. This contributes to the creation of a disjunction between the communicative ideal being promoted (transparency) and the conditions under which one's point of view is exercised. Being an embedded researcher does not imply demonstrating "you do what you say," which is unfortunately the prerogative of many surveys that adopt a comprehensive sociology of agreement to the values and norms of openness. The result is the creation of an in-between situation: it becomes necessary to situate oneself in the interstice in order to hold the inquiry and still be able to produce knowledge. (Labelle 2020a, 84)

Writing in English is not the only trick to inhabit interstices. Professional trips—for teaching, conferences, or merely remote working—are also one way for the researcher to be "multipositioned."

But, more importantly, the "discomfort of the field" is for ethnographer Martin de La Soudière (1988) a condition of its felicity. Thus, frictions can be seen as ways to maintain the researcher in such a liminal space, both or alternately inside and outside openness, that needs to be constantly adjusted.[23] Indeed, frictions—either observed, experienced, or even provoked—can be used as methodological tools to maintain critical distance while objectifying it and, in doing so, shedding light on professional practices, the organization's functioning, diverse conceptions of research, or competing philosophies of the open. Eventually, one way to be both inside and outside openness is precisely to look the rhetoric of open in the eye, together with its actors.

b. When Boundary Objects Collapse

"Open access," "open science," "ecosystem," "data," or "research"—a panoply of terms and expressions circulate within the infrastructure and beyond it through its interfaces with other organizations. These terms, widely mobilized yet seldom explicitly and unequivocally defined, seem to bear many meanings according to their context of utterance or inscription, either in a project proposal, a general assembly, or an activity report. Building on the work of Susan Leigh Star, James R. Griesemer, and Geoffrey C. Bowker, we can conceive of these expressions as verbal "boundary objects":

> We define boundary objects as those objects that both inhabit several communities of practice and satisfy the informational requirements of each of them. In working practice, they are objects that are able both to travel across borders and maintain some sort of constant identity. They can be tailored to meet the needs of any one community (they are plastic in this sense, or customizable). At the same time, they have common identities across settings. This is achieved by allowing the objects to be weakly structured in common use, imposing stronger structures in the individual site tailored use. They are thus both ambiguous and constant; they may be abstract or concrete. (Bowker and Star 1999, 16; see also Star and Griesemer 1989)

23. "The challenge is to be able to consider that the distance from our research object is constantly changing as our investigations progress, and that our practice and methods are agents of transformation" (Labelle 2020a, 19).

Boundary objects are essential to the dynamics of openness. Indeed, while studying the dynamics of knowledge production on Wikipedia, Nathanael Tkacz highlighted the importance of "boundary statements" (Tkacz 2015, 81), defined as discursive objects designed to bridge the many competing, contradictory, even irreconcilable *frames* involved in a dispute about an article. For Samuel Moore, the vitality—undecidability, even messiness (Adema 2014)—of open access is premised on it being a potent boundary object: While "theorising it as a boundary object allows us to conceptualise OA as a community-led process without fixed meaning and continually open to interpretation," he warns us against the "enclosure" of such boundary objects by policymakers, emptying them of their power to bind diverse communities of practice (Moore 2017). Finally, Gruson-Daniel, drawing on Alice Krieg-Planque's work, conceived of "the open" as a *formula*, a "verbal sequence," easily recognizable and relatively stable (Gruson-Daniel 2018, 32). By circulating, a formula becomes a condition of possibility for collective negotiation: "Its very use contributes to the dynamics of the debates associated with it, associating it with a given meaning" (33).

While it could be argued that "open science" is a well-defined concept thanks to a variety of policy frameworks and institutional documents, we cannot take for granted that, at the level of the infrastructure, there is no definitional ambiguity and play around it. Indeed, some agents at OpenEdition do not really care about open, and for them working for OpenEdition is "just another job"; for others, who have been here a long time, open science has a protracted history with shifting meanings, and it is uncertain whether the last official meaning is the best suited for their praxis; others relate more to ideals of free software, which very seldom appears, if at all, in its ideological complexity in current definitions of open science; others yet relate more directly to citizen and participatory science, which may appear in the UNESCO definition but are missing from the official French one. Hence, the infrastructure cannot be reduced to a mere facilitator for the enforcement of higher policies and definitions, and its agents do not merely "enact" one of the institutional or political definitions that are out there on the market. Rather, they partake, however discretely, in the defining process, starting with the appropriation of a, sometimes contradictory, diversity of definitions that they confront with their own values and professional *praxis*. Therefore, not taking for granted the institutional or political definitions and not assuming that the definitional issue is settled, the infrastructure appears as a place where definitions are constantly renegotiated in practice rather than merely enacted from above, as a *nexus* where what open science means could be negotiated by confronting policies with practices. Being essential to the dynamic of all things open, boundary statements, boundary objects, or formulae are privileged observatories for the study of open science and its negotiations. Beneath the potential enclosures that policymakers generate by forcing boundary objects to precipitate a legal definition,

there are, within infrastructures and at their interfaces, many fleeting moments when boundary objects temporarily collapse. The ephemeral collapse of a boundary object can become the *locus* of a discrete moment of negotiation about what open science is. Whenever, in a given context, one or several actors are faced with the necessity to clarify, in part or in whole, a boundary object, the technical rationality of the infrastructure shatters and reveals the value conflicts, the epistemic frictions, and the many tensions that inhabit and move it.

There are at least two ways to seize such moments when a boundary object temporarily collapses: either to witness these fleeting moments happening in a "natural" setting—a meeting (and there are many), a seminar, an exchange of emails, a workshop, a jury—or to spark them off in an experimental setting, such as a survey or a semi-directed interview. In the first case, ethnographic observation conducted on-site allows the researcher to document discrete moments when boundary objects—such as "open science," or even "research" in the case of the present contribution—are being negotiated. In the second case, such collapses can be intentionally provoked in surveys and interviews where the respondents are explicitly asked to define, either freely or choosing among a set of inclusive or exclusive possibilities, the meaning of a given expression, how it describes their practice, in what ways it is related to other terms, in what context they mobilize the term, and whether they identified competing or contradictory uses.[24]

In between "natural" and experimental settings, some interventions in the socio-technical development and maintenance of the infrastructure may parallelly serve as ethnographic probes—that is, moments of active participation in the life of the infrastructure in contexts the researcher is personally involved in.[25] These interventions serve as tests (*épreuves*), in the sense of French pragmatic sociology, to explore the room available for critical thinking about open science within the development of infrastructures, or to assess to what extent it is possible to question the very values enacted by those infrastructures. Probing the infrastructure in this manner sheds light on the "value conflicts" (Cohoon 2024) that are muffled by its technical-rational functioning and shows how, in this context, what "open science" means is continually, yet fleetingly and discretely, negotiated among actors in dissymmetric situations.

24. This was done at OpenEdition for the term "ecosystem" (Dumas Primbault, forthcoming) and is being deployed with SSH researchers for the term "data" in the context of the PaRéDo SHS project (see https://lab.hypotheses.org/paredo-shs-2024-2027).

25. Such was the case in at least two instances: First, when a group of agents, including me, asked the infrastructure to take a public stance on the rise of the far-right—historically, and very contemporaneously, the enemy of (open) knowledge—in the context of the 2024 French snap legislative elections and, second, when I offered to debate in a seminar about whether the infrastructure should continue using X for public communication. Both subjects were closed by means of technical-rational justifications according to which the infrastructure, as an institution, cannot take part in politics and that its agents' discourses on the subjects are mere personal opinions.

c. In media res

Observing, interviewing, or probing raises important methodological questions both in epistemic terms (what phenomena and inscriptions thereof may qualify as valid research material) and in ethical terms (how to not betray the researchees/colleagues by informing and involving them rightly). These socio-epistemic issues immediately forbid two kinds of approaches: the extractivist and the "covert" approaches. First, the field and the people involved are not natural resources to be mined as articles, books, and blogs were during the first phase of OpenEdition Lab: "The social world is not constituted as a 'deposit [*gisement*]' from which the researcher draws objects for analysis, but as a space to which the researcher belongs and in which meaning and values are manifested, circulated, and modified for and by each of the protagonists involved. This approach has led me to accept proximity to the situations observed, and to live certain experiences with complete involvement. This is reflected in the difficulty of reporting on them for oneself or for others, or of 'objectifying' what was happening" (Labelle 2020b, 20). Second, while certain locked or shrouded fields may justify a "covert inquiry"—that is, without informing the researchers—in order to "unveil the objective structures" (Bourdieu, in Rowell 2022) of an organization, my fieldwork is premised on the pragmatist stance that the infrastructure's agents act according to a plurality of "modes of engagement" that need be credited and understood as such rather than as the manifestation of some other hidden and biased rationale of which they would be unconscious.

Consequently, as both a colleague and an embedded researcher, in order to witness the collapse of boundary objects and take part in the life of the infrastructure, it is necessary for me to be *in media res*—that is, according to Labelle again, "Being embedded was not only to acknowledge that I was not master of the surveyed spaces and that I was not in a position of domination in relation to the people with whom I found myself, but also to inscribe myself in the discursive and pragmatic space of the survey sites, and thereby to signify the recognition of certain logics of action [*signifier la reconnaissance de certaines logiques d'action*]" (Labelle 2020b, 20). More importantly, this leads to acknowledgment that "the researcher is not the only person to produce knowledge, while nonetheless having the prospect of producing knowledge other than that recognized in the professional field under observation" (Labelle 2020a, 86).

Notably, in the case of OpenEdition and its Lab, it is of the utmost importance for the researcher to acknowledge and legitimize the specific expertise the infrastructure's agents developed in the exercise of their profession. Often disqualified, delegitimized, and discredited as personal opinions or political endeavors—at the risk of turning open science into "institutional knowledge [*savoir d'institution*]" (Laboulais 2023)—these many expertises result from daily use, maintenance, and development of the infrastructure as a fully-fledged socio-technical device that is also in constant contact with the

many different communities of users as well as with other national and international organizations. Eventually, researching *in media res*, sometimes to the point of "forgetting about the inquiry [*l'oubli de l'enquête*]" (Labelle 2020a, 80), implies co-constructing the knowledge about the infrastructure together with its agents.

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The term "open science" thus appears to be a boundary object, or an expression used by a wide variety of actors, without any single, unambiguous definition being shared by them. It is this vagueness, which is sometimes deliberately maintained, that makes it possible to coordinate, in a particularly dynamic context, the collective action of extremely diverse and varied stakeholders—sometimes very difficult to grasp (think, for example, of non-academic users of open access scientific content). This vagueness can become frictional when these same stakeholders are called upon to define, defend, and update their own understanding of "open science" and the value system associated with it.

The role of the embedded researcher, *in media res*, is to co-construct knowledge about the infrastructure together with its agents. While Labelle calls this research posture "participant interpretation" (Labelle 2020b, 28), I would rather call it "observant participation": "Where participant observation presents more opportunities for mobile positioning, outward gazing, and inscription, observant participation presents more opportunities for fixed positioning, inward gazing, and incarnation" (Seim 2024). Here indeed, rather than moving from one position to another, I am fixed as coordinator of the Lab, "embedded in labor, under and against management" (Seim 2024). I take an inward gaze as I confront my own socio-epistemic features with the infrastructure's and am an embodied individual focusing on incarnated reactions alongside inscriptions.

Conclusion: Open Epistemologies for Open Infrastructures in SSH

In the course of the history of science, according to Bruno Latour (1991), scientific modernity built itself on a fundamental distinction between nature and culture—or between facts and values, between technology and politics—enforced by the institutionalization of science with the creation of learned societies and academies. While this distinction allowed for the professionalization and specialization of many scientific fields in the 19th and 20th centuries, it also acted as blinders and let natural-cultural "hybrids"—such as GMOs, nuclear power, global warming—multiply in what Latour called the "middle kingdom."

In the same manner, the gradual institutionalization of OpenEdition and the consequent manifestation of certain epistemic features such as technical rationality eschewed the proliferation of fully-fledged socio-technical "hybrids" at its heart—pressing

ecological issues, the use of X, the rise of the far-right, the role of generative AI, open science in the Global South—that now return as boundary objects collapse. As it appears, OpenEdition is not an "open infrastructure," but what does it take for an "infrastructure for open access" to become an "open infrastructure"?

Open science is a fast-moving target, and producing an empirical and critical discourse about it is one of the many ways to keep it messy and alive. Against socio-epistemic enclosures, what is at stake here is the legitimacy and reach of critical knowledges in society (Renisio 2017; Gautier and Zancarini-Fournel 2022) and more specifically the role of SSH in the construction and development of open science, not just for SSH communities and practices but also for scientific research at large.

A few steps towards an epistemology for open infrastructures in SSH must be taken to avoid a new form of enclosure brought about by the open (Tkacz 2015, 2021). Indeed, if "open" cannot be reduced to a business model (Adema 2014), nor should it enclose and enforce a too narrow "spontaneous epistemology." Drawing on the field of infrastructure studies for which infrastructures are not neutral, but heavily value-laden, and specifically with socio-epistemic values and in view of the above discussion, a few pointers can be (re)asserted both for the infrastructure itself and for the researchers studying it from within:

- Recognize the prescriptive power of the infrastructure, or the ways it shapes scholarly practices and communities of practice through technical means such as standards, interfaces, or platforms.[26]
- Acknowledge the performativity of the infrastructure as an entity, or how it acts on its surroundings even when refraining from intervening, as status quo in a moving ecosystem does not amount to inaction (Dumas Primbault 2025).
- Accommodate for epistemic diversity in the functioning of the infrastructure, in the content it hosts, and in the practices it supports and shapes (Knöchelmann 2021; Leonelli 2023; Dumas Primbault 2024).[27]

26. Notably, for OpenEdition: "Scholarly communication infrastructures, through the regulations and conditions imposed on supported journals, the technical standards, and their design and interfaces, exert a formative influence on communities in diverse and often subtle ways" (Gatti et al. 2025, 28).

27. Notably, for qualitative research on open science: "Open science approaches and practices have been developed in response to challenges in quantitative research (such as the replicability crisis), and with quantitative research methods and data in mind. What many qualitative researchers have in common is that they face pressures to comply with practices and guidelines associated with open science not designed with our prominent research approaches, methods, and data types in mind" (Prosser et al. 2023); and "Open science guidelines fail to account for research based on epistemologies that are not strictly positivist and methods that are not strictly quantitative in nature, such as qualitative and interpretivist approaches. As such, they have unfortunately had limited applicability to those kinds of research. Feminist and qualitative scholars have long maintained that there are multiple ways of understanding, yet evangelists of the open science movement have commonly made assumptions that there is a shared understanding of a specific type of research (e.g., empiricism, deductive reasoning)" (Steltenpohl et al. 2023).

- Co-construct knowledge about the infrastructure together with its agents by legitimizing the specific expertises they develop in the daily exercise of their profession.

Eventually, this points to the somewhat obvious yet forgotten fact that open science cannot rely on technical rationality and would benefit from a participatory and citizen setting favoring epistemic diversity and collegiality.

Open Peer Review Reports

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Author Biography

Initially trained as a theoretical physicist at the École polytechnique, I turned to the philosophy and history of science in order to better understand my own practice—and I never left the social sciences and humanities (SSH). After a PhD in the history of science focusing on the material practices of two 17th-century scholars (Gottfried Wilhelm Leibniz and Vincenzo Viviani, Galileo's last pupil), I gradually turned towards contemporary scholarly practices, especially when they are mediated by digital technologies. Using concepts and methods from the sociology of science, library and information studies, digital humanities, and science and technology studies (STS), I documented reading-writing practices on Gallica, the online platform of the French national library. Today, as a Centre national de la recherche scientifique (CNRS) junior professor and coordinator of OpenEdition Lab, I am in charge of a program of research on open science for SSH, focusing on its practices, infrastructures, and policies.

References

Aabid, Mohsine. 2025. "Rapport observatoire des usages COMMONS (Partie quantitative) 2024–2025." OpenEdition. https://hal.science/hal-05093819v2.

Adema, Janneke. 2014. "Embracing Messiness: Open Access Offers the Chance to Creatively Experiment with Scholarly Publishing Messiness." *LSE Impact Blog*, November 18. https://blogs.lse.ac.uk/impactofsocialsciences/2014/11/18/embracing-messiness-adema-pdsc14/.

Aldrin, Philippe, Pierre Fournier, Vincent Geisser, and Yves Mirman, eds. 2022. *L'enquête en danger: Vers un nouveau régime de surveillance dans les sciences sociales*. Armand Colin.

Althusser, Louis. 1974. *Philosophie et philosophie spontanée des savants (1967)*. Maspero.

Anderson, Chris. 2008. "The End of Theory: The Data Deluge Makes the Scientific Method Obsolete." *Wired*, June 23. https://www.wired.com/2008/06/pb-theory/.

Arthur, Paul Longley, and Lydia Hearn. 2024. *Open Scholarship in the Humanities*, Bloomsbury Academic. https://library.oapen.org/handle/20.500.12657/87503.

Béquet, Gaëlle. 2014. *Trois bibliothèques européennes face à Google: Aux origines de la bibliothèque numérique (1990–2010)*. École nationale des Chartes.

Bermès, Emmanuelle. 2020. "Le numérique en bibliothèque: Naissance d'un patrimoine: L'exemple de la Bibliothèque nationale de France (1997–2019)." PhD diss., Ecole nationale des Chartes. https://theses.hal.science/tel-02475991.

Bonneuil, Christophe, and Pierre-Benoît Joly. 2013. *Sciences, techniques et société*. La Découverte.

Bowker, Geoffrey C., and Susan Leigh Star. 1999. *Sorting Things Out: Classification and Its Consequences*. MIT Press.

Chartron, Ghislaine. 2018. "L'Open science au prisme de la Commission européenne." *Éducation et sociétés* 1:177–93.

Chartron, Ghislaine, and Joachim Schöpfel. 2017. "*Open access* et *Open science* en débat." *Revue française des sciences de l'information et de la communication* 11. https://journals.openedition.org/rfsic/3331.

Chubin, Daryl E. 1985. "Open Science and Closed Science: Tradeoffs in a Democracy." *Science, Technology & Human Values* 10 (2): 73–80. https://doi.org/10.1177/016224398501000211.

Cohoon, Johanna. 2024. "*READ**THIS*!! Spam as a Threat for Open Science." *New Media & Society* 27 (9): 5151–79. https://doi.org/10.1177/14614448241248655.

Cramer, Katharina C., and Olof Hallonsten, eds. 2020. *Big Science and Research Infrastructures in Europe*. Edward Elgar Publishing.

Dalbello, Marija. 2005. "A Phenomenological Study of an Emergent National Digital Library, Part I: The Narratives of Development." *Library Quarterly* 75 (4): 391–420.

Daston, Lorraine. 1995. "The Moral Economy of Science." *Osiris* 10:2–24. http://www.jstor.org/stable/301910.

David, Paul A. 2008. "The Historical Origins of 'Open Science': An Essay on Patronage, Reputation and Common Agency Contracting in the Scientific Revolution." *Capitalism and Society* 3 (2). https://ssrn.com/abstract=2209188.

Desrosières, Alain. 1993. *La Politique des grands nombres: Histoire de la raison statistique*. La Découverte.

Dumas Primbault, Simon. 2024. "Pour un principe de diversité épistémique dans le processus d'élaboration des décisions publiques." OpenEdition Lab blog, August 27. https://lab.hypotheses.org/3486.

Dumas Primbault, Simon. 2025. "Du Poste de Lecture Assistée par Ordinateur (P.L.A.O.) au schéma numérique: Trois étapes de la re-médiation de laBnF." *Sens public*, October 2. https://sens-public.org/articles/1796/.

Dumas Primbault, Simon. Forthcoming. "OpenEdition as a *governed milieu*: Towards an Ecological Understanding of Open Digital Knowledge Infrastructures." In *Politics of Open Infrastructures: Exploring Open Digital Knowledge Infrastructures and Socio-Political Dynamics*, edited by Katja Meyer and Astrid Mager. Open Books Publishers.

Edwards, Paul N., Matthew S. Mayernik, Archer L. Batcheller, Geoffrey C. Bowker, and Christine L. Borgman. 2011. "Science Friction: Data, Metadata, and Collaboration." *Social Studies of Science* 41 (5): 667–90. https://doi.org/10.1177/0306312711413314.

Faïta, Ioanna. 2025. *Rapport d'étude exploratoire COMMONS 2023–2024*. ELICO, OpenEdition Center. https://hal.science/hal-05126205v1.

Faïta, Ioanna. 2026. "Tensions et zones d'ombre autour de la science ouverte en SHS en France." *Journal of Electronic Publishing* 29 (1).

Foucault, Michel. 1966. *Les Mots et les choses: Une archéologie des sciences humaines*, Gallimard.

Gatti, Rupert, Pierre Mounier, and Johan Rooryck. 2025. "Beyond 'No Fee': Why Diamond Open Access Is Much More Than a Business Model." In *Current Trends in Open Science: Will Open Science Change the World?*, edited by Nicola Cavalli. Ledizioni. https://library.oapen.org/handle/20.500.12657/99339.

Gautier, Claude, and Michelle Zancarini-Fournel. 2022. *De la défense des savoirs critiques: Quand le pouvoir s'en prend à l'autonomie de la recherche*. La Découverte.

Geoghegan, Bernard Dionysius. 2023. *Code: From Information Theory to French Theory*. Duke University Press.

Girard, Chloé. 2017. "Les mécanismes de centralisation des données de la recherche: Étendre l'accès libre à l'hébergement libre." *Revue française des sciences de l'information et de la communication* 11. https://doi.org/10.4000/rfsic.3255.

Goëta, Samuel. 2024. *Les données de la démocratie: Open data, pouvoirs et contre-pouvoirs*. C&F Éditions.

Gruson-Daniel, Célya. 2018. "Numérique et régime français des savoirs en-action: L'open en sciences: Le cas de la consultation 'République numérique' (2015)." PhD diss., Université Paris Descartes. https://theses.hal.science/tel-02515981/.

Gruson-Daniel, Célya, and Maya Anderson-González. 2021. *Étude exploratoire sur la "recherche sur la recherche": Acteurs et approches*. Research report, Comité pour la science ouverte, Ministère de l'enseignement supérieur et de la recherche. https://hal-lara.archives-ouvertes.fr/hal-03663434.

Hagner, Michael. 2018. "Open Access, Data Capitalism and Academic Publishing." *Swiss Medical Weekly* 148. https://doi.org/10.4414/smw.2018.14600.

Hauptmann, Emily. 2024. "Rediscovering the Early History of Social Scientific Data Centers in the US." *Revue d'histoire des sciences humaines* 45 (1): 43–67. https://doi.org/10.4000/13auz.

Hey, Tony, Stewart Tansley, and Kristin Tolle, eds. 2009. *The Fourth Paradigm: Data-Intensive Scientific Discovery*. Microsoft Research.

Ibekwe-SanJuan, Fidelia, and Françoise Paquienséguy. 2015. "Open, Big, Collaboration: Trois utopies de l'innovation au 21ème siècle." In *Big Data—Open Data: Quelles valeurs? Quels enjeux: Actes du colloque "Document numérique et société,"* edited by Évelyne Broudoux and Ghislaine Chartron, 15–29. De Boeck Supérieur.

Knöchelmann, Marcel. 2019. "Open Science in the Humanities, or: Open Humanities?" *Publications* 7 (4). https://doi.org/10.3390/publications7040065.

Knöchelmann, Marcel. 2021. "The Democratisation Myth: Open Access and the Solidification of Epistemic Injustices." *Science & Technology Studies* 34 (2): 65–89. https://doi.org/10.23987/sts.94964.

Labelle, Sarah. 2020a. "Enseigner & Chercher, Pratiques palimpsestes." Habilitation dissertation, vol. 2, Université Paris-Est.

Labelle, Sarah. 2020b. "Médiations & pouvoirs de l'agir ingénieur: Mythe et infrastructures des politiques de données." Habilitation dissertation, vol. 1, Université Paris-Est.

Laboulais, Isabelle. 2023. "Dénaturaliser la science ouverte: La genèse d'un savoir d'institution." *Zilsel* 12 (1): 11–28. https://doi.org/10.3917/zil.012.0011.

Lamy, Jérôme, and Arnaud Saint-Martin. 2011. "Pratiques et collectifs de la science en régimes: Note critique." *Revue d'histoire des sciences* 64 (2): 377–89. https://doi.org/10.3917/rhs.642.0377.

Latour, Bruno. 1991. *Nous n'avons jamais été modernes: Essai d'anthropologie symétrique*. La Découverte.

Leonelli, Sabina. 2023. *Philosophy of Open Science*. Cambridge University Press. https://doi.org/10.1017/9781009416368.

Levain, Alix, Florence Revelin, Anne-Gaëlle Beurier, and Marianna Noël. 2023. "La crédibilité des matériaux ethnographiques face au mouvement d'ouverture des données de la recherche." *Revue d'anthropologie des connaissances* 17 (2). https://doi.org/10.4000/rac.30291.

Macfarlane, Bruce. 2023. "The DECAY of Merton's Scientific Norms and the New Academic Ethos." *Oxford Review of Education* 50 (4): 468–83. https://doi.org/10.1080/03054985.2023.2243814.

Monjour, Servanne. 2023. "Pourquoi et comment déplateformiser une revue scientifique?" HN Lab Log, June 27. https://hnlab.huma-num.fr/blog/2023/06/27/pourquoi-comment-deplateformiser/.

Moore, Samuel A. 2017. "A Genealogy of Open Access: Negotiations Between Openness and Access to Research." *Revue française des sciences de l'information et de la communication* 11. https://doi.org/10.4000/rfsic.3220.

Mounier, Pierre, and Simon Dumas Primbault. 2023. "Sustaining Knowledge and Governing Its Infrastructure in the Digital Age: An Integrated View." Preprint, Zenodo, October 24. https://doi.org/10.5281/zenodo.10036401.

Pestre, Dominique. 2006. *Introduction aux Science Studies*. La Découverte.

Peterson, David, and Aaron Panofsky. 2023. "Metascience as a Scientific Social Movement." *Minerva* 61:147–74. https://doi.org/10.1007/s11024-023-09490-3.

Plutniak, Sébastien. 2019. "À distances raisonnables des structuralismes: Logique, langage, formalisation et sciences de l'homme Une dispute du 20e siècle finissant." *Zilsel* 6 (2): 70–115. https://doi.org/10.3917/zil.006.0070.

PNSO. 2021. *Deuxième plan national pour la science ouverte: Généraliser la science ouverte en France 2021–2024*. Comité pour la science ouverte, Ministère de l'enseignement supérieur et de la recherche. https://www.ouvrirlascience.fr/deuxieme-plan-national-pour-la-science-ouverte/.

Porter, Theodore M. 1995. *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life*. Princeton University Press.

Prosser, Annayah M. B., Richard J. T. Hamshaw, Johanna Meyer, Ralph Bagnall, Leda Blackwood, Monique Huysamen, Abbie Jordan, Konstantina Vasileiou, and Zoe Walter. 2023. "When Open Data Closes the Door: A Critical Examination of the Past, Present and the Potential Future for Open Data Guidelines in Journals." *British Journal of Social Psychology* 62 (4): 1635–53. https://doi.org/10.1111/bjso.12576.

Renisio, Yann. 2017. "L'infortune des sciences sociales: Sociologie d'une illégitimation scientifique récurrente." PhD diss., EHESS. https://theses.fr/2017EHES0073.

Rowell, Jay. 2022. "Production et reproduction des hiérarchies disciplinaires dans une grande université de recherche française." *Sociologie* 3 (13). http://journals.openedition.org/sociologie/10508.

Schöpfel, Joachim. 2015. "Open Access—the Rise and Fall of a Community-Driven Model of Scientific Communication." *Learned Publishing* 28 (4): 321–25. https://doi.org/10.1087/20150413.

Seim, Josh. 2024. "Participant Observation, Observant Participation, and Hybrid Ethnography." *Sociological Methods & Research* 53 (1): 121–52. https://doi.org/10.1177/0049124120986209.

Shapin, Steven. 2008. *The Scientific Life: A Moral History of a Late Modern Vocation*. University of Chicago Press.

Slavnic, Zoran. 2013. "Towards Qualitative Data Preservation and Re-Use—Policy Trends and Academic Controversies in UK and Sweden." *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research* 14 (2): 10. https://www.qualitative-research.net/index.php/fqs/article/view/1872.

Soudière, Martin de La. 1988. "L'inconfort du terrain." *Terrain* 11:94–105. https://doi.org/10.4000/terrain.3316.

Star, Susan Leigh, and James R. Griesemer. 1989. "Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907–39." *Social Studies of Science* 19 (3): 387–420. http://www.jstor.org/stable/285080.

Star, Susan Leigh, and Karen Ruhleder. 1996. "Steps Toward an Ecology of Infrastructure: Design and Access for Large Information Spaces." *Information Systems Research* 7 (1): 111–34.

Steltenpohl, Crystal N., Hilary Lustick, Melanie S. Meyer, Lindsay Ellis Lee, Sondra M. Stegenga, Laurel Standiford Reyes, and Rachel L. Renbarger. 2023. "Rethinking Transparency and Rigor from a Qualitative Open Science Perspective." *Journal of Trial & Error* 4 (1). https://doi.org/10.36850/mr7.

Tkacz, Nathaniel. 2015. *Wikipedia and the Politics of Openness*. Chicago University Press.

Tkacz, Nathaniel. 2021. "From Open Source to Open Government: A Critique of Open Politics." *ephemera* 12 (4): 386–405. https://ephemerajournal.org/contribution/open-source-open-government-critique-open-politics-0.

Tournay, Virginie. 2011. *Sociologie des institutions*. Presses Universitaires de France. https://shs.cairn.info/sociologie-des-institutions--9782130585565.

Valluy, Jérôme. 2017. "Libre accès aux savoirs et accès ouvert aux publications." *Revue française des sciences de l'information et de la communication* 11. https://doi.org/10.4000/rfsic.3194.

Vanholsbeeck, Marc. 2017. "La notion de Science Ouverte dans l'Espace européen de la recherche." *Revue française des sciences de l'information et de la communication* 11. https://doi.org/10.4000/rfsic.3241.

Von Schomberg, René. 2024. "Towards a New Ethos of Science or a Reform of the Institution of Science? Merton Revisited and the Prospects of Institutionalizing the Research Values of Openness and Mutual Responsiveness." *Novation: Critical Studies of Innovation* 6. https://doi.org/10.5380/nocsi.v0i6.95874.

Winner, Langdon. 1980. "Do Artifacts Have Politics?" *Daedalus* 109 (1): 121–36. https://www.jstor.org/stable/20024652.

Zurbach, Jonathan. 2024. "'Soutenir et améliorer la science': Discours, financements et politiques scientifiques des infrastructures de recherche pour les données quantitatives des sciences sociales (1964–2024)." PhD diss., Université d'Avignon. https://theses.hal.science/tel-04974327.