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The OHM Pays de Bitche as a testing ground for interdisciplinary and participatory scientific practice

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Research article

Human Environment Observatory

The OHM Pays de Bitche as a testing ground for interdisciplinary and participatory scientific practice

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Abstract. This article explores the process of implementing an interdisciplinary and participatory scientific approach in the "OHM Pays de Bitche" (Pays de Bitche Human-Environment Observatory).

Keywords. Interdisciplinarity, Participatory research, Experimentation, Action, Cooperation, Gift.

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1. Introduction

Interdisciplinarity means bringing people from different scientific disciplines together to work on the same area of study[1]. Meanwhile, participatory research aims to get scientists and non-scientists working together[2]. Developing interdisciplinarity and participatory research hinges on the circulation of knowledge, which calls for mutual understanding[3]. In both cases, these practices essentially revolve around social exchange[4]. We often think that well

[1] Translator's note: all quotations in this paper have been translated from the original French source. There are many, relatively similar definitions of interdisciplinarity. Generally, they all set it apart from multidisciplinarity (the juxtaposition of disciplinary knowledge) and transdisciplinarity (research combining scientists and non-scientists in the same knowledge production process). They then stress that interdisciplinary tends to articulate knowledge in the form of a dialogue that partially reorganizes the theoretical fields involved [Chenorkian, 2023, Louvel, 2015, Vinck, 2000].

[2] Participatory research is covered by a number of fairly polysemous definitions that largely agree on its experimental nature [Billaud et al., 2017].

[3] My intention is not to further the debate on the best way of qualifying and defining interdisciplinarity and participatory research; I prefer to focus on the specifically experiential and situative dimension of these practices. This approach, inspired by the sociology of action, focuses on how individuals forge relationships with one another as they take action together.

[4] These social exchanges may make it possible to reconcile science and democracy, in the sense that they contribute to "the invention of mechanisms that encourage, promote and nurture the possibility for citizens to take an interest in the knowledge that aspires to guide and build their future, and that compels this knowledge to reveal itself and to challenge their choices, their relevance, the issues they prioritize and those they neglect" [Stengers, 1997]. This search for conciliation should not suggest that there is a structural opposition between science and democracy. On the contrary, the process aims to deepen the democratic dynamic through a "dialogical democracy" [Callon et al., 2001].

thought-out coordination procedures will suffice to foster interdisciplinarity, citizen participation in scientific activity or, in a word, cooperation. Except that intention is not the same thing as achievement. Given the intellectual aspect of scientific work, we often overlook the fact that cooperation cannot be dictated, but this is something that is experienced practically on a day-to-day basis. This is especially true when we acknowledge that the mainspring of cooperation is driven by emotions, the effects of which (sympathy, recognition, gratitude, pride, pleasure, etc.) and the mishaps that occur along the way generally elude supposedly rational thinking of researchers. Human sciences—and the sociology of work in particular—highlight the importance of technical coordination procedures. However, they also underscore the fact that these procedures remain inadequate since they need to be given meaning if they are to be effective in any way. This article explores the process of implementing an interdisciplinary and participatory scientific approach in the "OHM Pays de Bitche" (Pays de Bitche Human-Environment Observatory), and draws some practical and theoretical conclusions.

2. The Pays de Bitche human-environment observatory (OHM)

Located in the north-east of the Moselle department, the Pays de Bitche is a landlocked rural area with the German border (Rhineland-Palatinate) to the north and the Bas-Rhin department to the south. The territory is home to just under 35,000 inhabitants in 46 municipalities. It was marked by a strong military presence for several centuries. However, the reconfiguration of the French armed forces since compulsory military service was abolished in 1996 appears to have triggered a profound transformation of the area, with widespread decline in rail services, industry, agriculture, demography and public services. Since 2015, the OHM Pays de Bitche has been studying this region as it undergoes transformation at the nexus of social and ecological phenomena, applying a socio-ecosystem approach focused on two main topics (which are not mutually exclusive). On one hand, there are the projects addressing the issues of decline and legacies. On the other hand, there are the projects looking at the area's carrying capacity, bringing to light the defining interpretative frameworks (the realm of meaning) and the resulting narrative processes.

From the outset, there were two aims when setting up this OHM: (i) a fairly conventional interdisciplinary objective, bringing together researchers from a variety of disciplinary backgrounds, and (ii) a "plural", "participatory" or "mixed" objective considering local stakeholders as legitimate members of our activities, given that local people know the area better than the researchers who set out to study it [Chenorkian, 2023, 2020]. Alongside half a dozen workshops to prepare the ground for this OHM, I also conducted close to 70 interviews with military personnel, association leaders, tradespeople, entrepreneurs, doctors, shopkeepers, elected representatives, civil servants, retired people, sportspeople, hunters, fishers, naturalists, teachers, hikers, farmers, beekeepers, foresters, artists, high school students, students, jobseekers, and so on, with a view to validating or rejecting the working hypotheses and the feasibility of the studies. This fieldwork gradually led to the formation of a multidisciplinary and multi-sectoral team of researchers and local stakeholders[5], all highly motivated by the collaborative study of the Pays de Bitche. Over time, this team managed to identify a structural factor of significant heuristic value, to define a socio-ecological focus and to identify key themes, in accordance with the OHM's terms of reference[6]. This work was then set out in a collaborative concept note submitted to the executive committee of LabEx DRIIHM in early January 2015. Creation of the OHM Pays de Bitche (OHM PdB) was approved by DRIIHM and CNRS-INEE (now called CNRS Ecology & Environment) on 1 March

[5]Since its beginnings, the OHM PdB has included around fifty researchers (biologists, historians, geographers, geochemists, pedologists, sociologists, etc.) as well as around twenty local actors (associative actors, cultural actors, engineers and conservationists from the Vosges du Nord regional natural park, forest agents, teachers, elected officials, hunters, naturalists, farmers, etc.). To get a more precise idea, see *Le Pays de Bitche. Un territoire en mutation* [Hein, 2024].

[6]The OHM terms of reference are conditioned by a "territory" in which a "founding event" occurs, from which a "structuring fact" arises, from which "socio-ecological issues" organized into "key themes" are constructed.

2015, making it the tenth OHM to become operational.

3. Social intelligence

At first glance, this sequential process appears to be the outcome of an approach designed to gather and organize the knowledge needed to understand the territory, and to satisfy the requirements of a scientific framework based on rationality; in other words, to demonstrate the rigour and logical consistency in the analyses[7]. In reality, the cold rationality of certain scientists sometimes resulted in a condescending attitude towards local stakeholders. In contrast, the fervent activism of a handful of local players sometimes came across as disdain for the scientists, who were perceived as not being sufficiently committed or as seeking to encroach on what the locals regarded as their turf. In both cases, everyone appeared to see competence as an individual quality and, as such, did not really see how they could benefit from sharing skills. Clearly, in both instances, this attitude reflects a lack of social intelligence [Næss, 2017] when it comes to behavioural skills[8]. Obviously, a lack of behavioural skills in no way prevents someone from pursuing a scientific career safe inside a laboratory, nor does it prevent someone from pursuing a career as an activist within a group that has already espoused their cause. Nonetheless, these positions denote a lack of emotional maturity, and thus prevent the development of a key quality—albeit one that is often underestimated in today's society: a sympathetic attitude. The ability to relate to others, the tact with which we approach others, is based on our ability to show understanding for emotions other than our own. Behavioural skills encompass a set of personal qualities and social aptitudes that are highly valuable in social interaction. The academic world, by virtue of its position in the social hierarchy, is seen as an authority but is not always fully aware of the role of feelings and emotions in social interactions[9]. Yet this is a crucial prerequisite for working collaboratively with others, whether they have a similar level of knowledge to you or not, for the simple reason that "competence has become collective: it means knowing how to work with and exchange with others" [Alter, 2009]. In this respect, if you want to run an interdisciplinary, multi-stakeholder research team, you first have to learn to show consideration for others, which can only be achieved by listening to and acknowledging them.

4. Democratizing research

How can local stakeholders be involved in a research activity, when there is presumed to be an asymmetry of knowledge and expertise between them and the academics? By recognizing that this knowledge and expertise are diverse and that they are spread across a wide range of stakeholders. As such, it is something to be shared both ways [Chenorkian, 2023][10]. Human activity can be performed in two main modes: a sociable mode and a non-sociable mode. Sociable activity addresses other people, and its guiding norms are transparent, i.e. understandable to the uninitiated. Non-sociable activity, by contrast, segregates and isolates. This process ultimately leads to a loss of quality. Sociologist Richard Sennett observed that this phenomenon is just as prevalent in science as it is in the craft or industrial sectors [Sennett, 2010]. However, in one case the activity progresses, while

[7] The model of rational thought is a legacy of Descartes, who in his *Meditations* in 1641, sought to align material reality with laws that only mathematical analysis could identify. Today, the computational theory of the mind inherent in cognitive psychology pursues the idea that we are a kind of "information processing system".

[8] To give one example among others, during the first seminar to report on the work of the OHM PdB in 2016, the buffet was organized by a local farmer, bison breeder, also vice-president of the *French breeders' association of American bison*. After quickly introducing it to one of the researchers present, the latter lectured him with strong comments on the physical and ethological characteristics of the animal, its reproductive behavior, its diet, as if an ignorant person were standing in front of him. A heartbreaking spectacle.

[9] As scientific rationality has developed, direct experience has been consigned to a secondary role. What prevails are quantifiable and measurable scientific facts. This is probably why we now expect so much from robots, transhumanism and artificial intelligence. To achieve maximum efficiency, we seek infallibility and thus predictability. In reality, human beings are not rational. They try to adopt rational behaviour, which is very different. It is amusing to note that only scientists continue to believe that they are rational, neutral and scientifically objective [Stengers, 2022].

[10] The sociology of expertise shows how common sense knowledge (semantic and procedural) is shared between experts and non-experts [Trépos, 1996, Lascoumes, 2002, Domènech, 2017].

in the other it invariably grinds to a halt. This finding encourages us to explore new forms of exchange as a means of democratizing research. In *Agir dans un monde incertain* (Acting in an Uncertain World), the sociologists Callon et al. [2001] call for the exploration of possible worlds, the invention of new procedures and the deployment of new assessment tools. This implies putting an end to the reign of experts, to the contempt for collective intelligence and to the demands for perpetual adaptation [Stiegler, 2019]. The idea of collective learning, irrespective of qualification levels, can enrich democracy provided that the research community agrees to step out of its laboratories. This could well be the model that best fits the idea of radical democracy (that is popular, egalitarian and deliberative) as expressed by philosopher and educationalist Dewey [2010]. A key consequence of the participatory nature of this radical democracy is that it dispenses with the construction of a certainty based on the expert's unilateral opinion[11], instead favouring a deeper understanding of uncertainty underpinned by collective expertise combining a range of disciplines, sectors and stakeholders. Of course, in the academic sphere, the combination of heterogeneous knowledge and stakeholders from diverse backgrounds is not a given. Social and educational structures are far from receptive to the prospect of democratizing research[12]. This is all the more true given that the world of research is still profoundly attached to the principle of reduction[13], that it is dependent on a disciplinary organization, that it is now subject to market-driven performance requirements and that, ultimately, it remains largely subservient to legitimist statutory considerations. While, overall, these reasons tend to keep participatory research in the realm of intentionality, or even incantation, they have never been a limiting factor for the experiments conducted by the OHM PdB, as we shall see in the rest of this paper.

5. Experimenting with research

The desire to democratize research is part of an alternative political philosophy with multiple but converging roots—a profound source of inspiration for the *modus operandi* of the OHM PdB. The first of these roots are the pragmatic movement, whose most famous theorists include John Dewey. The second derives from the theory of action popularized by Hans Joas. The third, which encompasses the previous two, is based on Marcel Mauss's gift paradigm.

5.1. *The theory of inquiry*

Dewey established a very strong link between democracy and pedagogy, with the ambition of reinstating each individual's power and skills [Dewey, 2022]. In his view, the purpose of learning (at school and, by extension, at university) is to increase our capacity for action, which is how the act of learning contributes to democracy. Dewey wanted to restore democracy at its source, starting with each citizen's competences. In trying to understand the way humans think [Dewey, 2004], he became convinced that the process of experience was essential. Experience in the sense of an emotional imprint, of something (an event or a relationship) that moves, stimulates and sets something in motion. But also in the sense of a hands-on experience that requires skill. [Sennett, 2000]. Dewey designed an education

[11] It is not a question here of asserting that scientists systematically behave like experts, but of recognizing that some of them can sometimes be tempted to arrogate to themselves the monopoly of rationality in deliberative spaces. Except that in practice, it is impossible to maintain a strict separation between ordinary people and experts. Expertise as we understand it today is "distributed" locally between a plurality of actors.

[12] The same applies to political participation. Despite citizens' aspirations, we can see little evidence of deliberative democracy in the quagmire of the prevailing representative democracy. The growing opposition to centralized public action seems to suggest that citizens are no longer content to make do solely with representative democracy. Public decision-making needs to be legitimized in two ways. In the first instance, via elections. But also during the process, through wider governance and the ongoing involvement of citizens to help shape public action. This is what we call the deliberative process. Deliberative democracy allows for greater social inclusion in decision-making, thereby rendering that decision-making more legitimate [Blondiaux and Manin, 2021, Domènech, 2017].

[13] The most prevalent form of knowledge in the Western world rests on a principle of reduction and disjunction. Reductionism means understanding a composite whole based on knowledge of the primary elements that it is made up of. The principle of disjunction, meanwhile, consists of isolating and separating cognitive difficulties from one another, which has led to the separation of disciplines that are now hermetic to one another [Morin, 1999].

system centred on research and children's needs, but also on the relevance of the solutions provided by science and technology. From this perspective, what makes him so original is his assumption that there is a common ground between what human knowledge has achieved throughout history and what children seek as solutions to the problems they encounter in the world. The strength of his thinking lies in the fact that this approach can be extended to all human beings, children and adults alike. And this approach is based on the theory of inquiry. Very simply put, for Dewey, the inquiry always starts from an indeterminate situation. An uncertain and unstable situation. From this starting point, humans formulate hypotheses and adopt an interpretative framework to guide their actions. These actions are then either validated or rejected by experience (trial and error). The advantage of this approach to action is that practice cannot be dissociated from cognition (gesture and reflection). The somatic (which concerns the body, as opposed to the psychic) is inseparable from the social body (the individual and the collective). In this sense, experience is an articulation of thought and action. An experiment in which ideas and hypotheses are constantly put to the test. Consequently, ideas and behaviour, norms and values are never acquired definitively. Some are more stable than others, but they are never immutable or eternal. It should be made clear that this is not simply a matter of adapting to the environment. It is not about adaptation, but about being creative in our tangible experience of the world.

5.2. *The theory of action*

The extent of human possibilities reflects a key concept in the human sciences: action. There are two dominant models of action in sociology. The first maintains that individuals are essentially shaped by the norms of the society they belong to. This means that there is relatively little room for free will since humans are largely conditioned by the processes of socialization, from a holist perspective. In contrast, the second model argues that individuals are relatively free to make their own decisions, i.e. that in all circumstances they act on the basis of an assessment of their actions, reflecting a rational choice consistent with the principles of methodological individualism. In the 1990s, a third model emerged, promoted by sociologist Joas [1999]. It emphasizes the creative nature of human action given the range of human possibilities (this model is not exclusive to the other two). In his view, creativity cannot be dissociated from all human activities; each of us is creative in our own way, and the very richness of the body provides the resources for a broad field of creative action[14]. Experiencing life calls for creativity. And creativity leads us to explore new possibilities for experience. For him, this creative dimension is built into rational and normative action. In this respect, the concept of social bricolage prevails [Javeau, 2001]. Of course, we cannot ignore the importance of habit and routine in human action. This is why we need to see creativity not in its romantic form (the mystery of inspiration, purported genius), but rather in terms of degrees. A creativity that generates connections to people, objects, skills or ideas. These analyses help us to understand the role of emotional dynamics in the paths taken by researchers and activists. In particular, they cast doubt on the idea that deliberative spaces and situations of expertise are devoid of emotion. Not only are the spheres of politics and expertise permeated by emotional dynamics, but these emotions contribute to the proper functioning of democratic regimes. In this theory, emotional logic and decision-making logic work together. These logics have the potential to trigger a commitment to action, which is precisely what the OHM seeks to encourage.

5.3. *The gift paradigm*

Marcel Mauss, one of the pioneers of French anthropology, believed that the general basis of human relationships is founded on the gift as a catalyst for social ties. According to him, the gift paradigm governs the essence of our relationships with others, in the form of a triple obligation: giving, receiving and reciprocating [Mauss, 2001]. It is, if you like, a law of reciprocity common to all human societies (whether primitive or modern). In this respect, Mauss

[14] Here, I am referring to the famous "techniques of the body" described by Mauss, who considered the human body as "man's first and most natural instrument" [Mauss, 2001]. The techniques of the body are to be found on a continuum that ranges from provoking emotions among spectators [Leveratto, 2006] to survival techniques [Clot, 2018].

considers the gift to be a complete social phenomenon covering all dimensions of social life—economic, political, religious, cultural, aesthetic, symbolic, and so on—which, in his view, it is important to reconstruct as finely as possible[15]. Mauss's thinking remains highly topical in that it powerfully refutes the assumptions of economic theory, which reduces human action to[2] the logic of self-interested calculation alone, and postulates that all significant human interaction needs to be analysed in terms of market relations[16]. Mauss demonstrated that most non-Western societies did not organize themselves according to market principles, and his successors have confirmed that this is still the case today [Graeber and Wengrow, 2021, Caillé, 2019]. Many leading intellectuals were quick to disqualify the gift paradigm on the grounds that it sought to explain human action in terms of love and devotion. This is a grotesque misunderstanding and points to the huge weight of interest and calculation in social analysis. It would be more accurate to consider the act of giving as ambivalent, at times selfless, at times self-serving, simultaneously voluntary and obligatory, sometimes hostile, at other times friendly, alternately a poison and a gift. I tend to think, in accordance with Alain Caillé, that the gift paradigm should be set as a kind of middle way, i.e. in its dialectical relations, which have considerable merit of highlighting human interdependencies and which, alas, are increasingly obscured under the assault of modernity [Debaise and Stengers, 2023]. The idea that human beings build lasting relationships through giving seems obvious to me and has convinced me to instil and nurture the spirit of giving within the OHM PdB. In France at least, setting up a human-environment observatory in a rural area is fairly straightforward. Where there's a will there's a way. Establishing a long-term presence in a territory is a completely different matter. We are reminded of this in a number of the sociological classics, heavily steeped in ethnography [Wacquant, 2001, Whyte, 1996, Wolf, 1995]. Alain Touraine, referring to William Foote Whyte's famous survey, summed things up quite explicitly: "the understanding of the other in the sharing of a common condition"[17]. There is a tendency to forget, however, that this willingness to understand others through participation (known as participant observation in the methodological jargon used in sociology) is worthless without the spirit of giving, which gives the research experience its full value.

6. Interdisciplinary and participatory research as polyphonic art

In principle, knowledge, like water, air, health and safety, is as precious as it is universal. All these elements are intended to be enjoyed by all and must therefore be accessible to all. In this respect, interdisciplinarity is not so much a personal effort or an institutional imperative as a gift that will potentially enrich each stakeholder. It is no different for local stakeholders. Their participation in research, whatever their level of commitment, is a process of give-and-take. Everything fits into the gift paradigm, from information, advice, a helping hand, a word of encouragement and a sympathetic eye to technical knowledge, a recommendation, a prescription, an analysis, an interpretation, or a little time given. Simply put, interdisciplinary and participatory research is founded on the belief that an alliance between all

[15] In many respects, Mauss's methodological recommendations are a precursor to the complex thinking theorized by Edgar Morin, for whom complexity refers to the elementary Latin meaning of the word "complexus". In other words, "that which is woven together". In his view, the real problem (of thought reform) is that we have learned to separate far too much. It would, in fact, be more useful to learn to link things. For Morin, linking is not just about establishing an end-to-end connection. Linking is about establishing a connection that operates in a dialogue loop. In line with Mauss, Morin advocates shifting from simple thinking (guessing, preferring, believing) to complex thinking (proposing hypotheses for solutions, creating relationships, seeking criteria, relying on valid justifications, accepting self-correction). And this shift can only occur through systematic learning. This requires social and educational structures conducive to complex and systemic thinking, of which OHM are potential agents [Morin, 1990].

[16] Broadly speaking, there are three main ways of considering the gift (which refer back to the theories of action mentioned above). Firstly, a gift motivated by interest, as favoured by economists Secondly, a totally selfless and voluntary gift, as favoured by philosophers. Thirdly, a gift offered under constraint, as favoured by structuralist sociologists and anthropologists. Here, my remarks will focus on the economic interpretation of the gift that dominates in the neoliberal context, considering its social, ecological and climatic ravages. For an in-depth look at the gift paradigm, I refer you to the work of Alain Caillé, and to the prolific works of *La Revue du MAUSS*.

[17] Back cover [Whyte, 1996].

parties is essential and unwavering. In practice, this conviction expands the work force and, in so doing, contributes to an experimental cross-learning process [Hubert et al., 2013][18]. Interdisciplinarity and participatory research are therefore nothing more than cooperative practices based on the exchange mechanisms at the heart of the social bond. Ultimately, the driving forces of cooperation lie more in the process of exchange than in its content. It may seem counter-intuitive to consider that the object of the exchange is less important than the process itself, but for sociologist Norbert Alter: "We choose to cooperate with a particular person because we want to cooperate with them. Social exchanges are often driven by emotion first, with professional considerations coming second." [Alter, 2009]. Cooperative relationships are founded on feelings—gratitude, pride or complicity—which bring pleasure that is sought after in its own right. This means that the personalities of the parties involved are decisive, since the quality of give-and-take relationships (in the sense of reciprocity) determines the functional effectiveness of the exchanges [Caillé, 2019]. Cooperation is therefore the mark of a kind of freely consented "mutual indebtedness" [Alter, 2009]. Agreeing to cooperate produces value since it generates exchanges of data, information and analyses and it creates social bonds, thus adding to the "substance of the world" [Debaise and Stengers, 2023]. In its astonishing simplicity, cooperation seems to make perfect sense. On closer inspection, however, this polyphonic cooperation requires very specific conditions for activation, before it can bring meaning and effectiveness to interdisciplinary and participatory practice.

6.1. *The conditions for cooperation*

Establishing cooperation within the gift economy starts with giving, which implies generosity on the part of those who aspire to work on a team. The next phase requires a reciprocal response. Cooperation is neither totally self-interested nor completely selfless, but requires a bond, reciprocity which, to be sustainable, must be based on stable relationships, or at the very least trust. Finally, to maintain the quality of the bonds, cooperation must recognize the investments made by each party, in other words, recognize each person as a subject and show them gratitude. Generally speaking, and to varying degrees, it is reasonable to assume that social exchanges are always organized in much the same way. The principle is simple: giving someone your time or knowledge encourages them to give in return. The satisfaction derived from this exchange generates cooperation and can potentially create what is known as "team spirit", which is itself a condition for the smooth running of OHM (or any other organization). The gift paradigm emphasizes the extent to which social exchanges help to forge links, which in turn enables the circulation of information, knowledge, ideas, reputations and forms of solidarity or exclusion that go far beyond what people are formally required to exchange. As a result, the nature of the links determines both the act of living together and of social avoidance. As Alter reminds us of the conclusion to his remarkable book: 'We cooperate because we feel connected or want to become connected. We refuse to cooperate for the opposite reasons. Taken together, all these small decisions produce what we call "social exchanges"' [Alter, 2009]. As far as the OHM PdB is concerned, the choice of extended cooperation has always prevailed, and I shall try to describe this with the help of several examples that illustrate the degrees of reciprocity between scientists and the local stakeholders[19]—albeit at the expense of a certain descriptive complexity, given the many links and issues that are difficult to untangle.

6.2. *Giving: Survey on ticks*

In theory, the spirit of giving that drives the OHM PdB is implicitly fuelled by a spirit of public service, which inherently commits researchers (public servants) to giving back (knowledge) what they have received (public money, or the trust of an institution such as the CNRS). In practice, researchers accept this type

[18] This experimental process should not be understood as a demonstration with the power to make everyone agree. It allows relatively heterogeneous interests to be tested, making everyone more attentive to motivations, consequences and risky generalizations.

[19] We could also talk about *mutualistic* links "i.e. those linking heterogeneous beings who need each other for different reasons" [Debaise and Stengers, 2023].

of argument to varying degrees. Some see the OHM simply as a way of funding their own research, while others—fortunately the majority—are well aware of the social issues involved in public research. This stance prompted us to establish the OHM PdB in the local landscape in a way that ensures the broadest possible dissemination of our results to the public. We thus set out to identify the relevant resource structures. The *communauté de communes* (grouping of municipalities) makes it possible to target local elected representatives and institutional leaders. The Lycée Teyssier (high school) in Bitche is useful for reaching out to students and teachers[20]. Finally, a wider and more diverse audience can be reached via the media library, cafés, community centres, municipal halls, farms and outdoor spaces. We cannot claim to have reached the entire population, far from it, but we have at least widened the scope as far as possible. Clearly, one of our greatest accomplishments has been kindling enthusiasm among the teaching staff at Lycée Teyssier in Bitche (the only lycée in the area). This eagerness soon convinced us to adjust our objectives to match the teachers' interests, first by running practical workshops for high school students to raise their awareness of the scientific approach. Each year, at the request of teachers, we have offered workshops in anthracology, palynology, parasitology, microbiology, cartography, sociology and ethnology, based on surveys carried out by researchers in the area, thus ensuring that the overall educational approach is highly coherent. We can take the example of the survey of ticks to illustrate some of these aspects[21]. This research programme was launched locally in 2016 with two conference/debates organized in community halls. The fact that between 150 and 200 people attended each time, and were particularly attentive and responsive, clearly shows that this was a sensitive issue[22]. This was confirmed by preliminary qualitative sociological surveys carried out in 2017 and 2018 by sociology students from the Université de Lorraine. After the Covid pandemic, the research resumed with a series of tick sampling campaigns (June 2020, April 2021, May 2021 and June 2021) at two sites[23]. At the same time, we sent a sociological questionnaire to Pays de Bitche residents in the first quarter of 2021 to assess their level of knowledge about ticks and associated diseases. What was original about this approach is that the questionnaire was administered by students from Lycée Teyssier, ensuring that we reached a population spread across the whole area, mainly made up of the students' families. In addition to this work, two microbiology and parasitology workshops were held in 2022 (indoor) and 2023 (field), along with a general-interest conference on the bacterial virulence of ticks (Figure 2) as part of an exhibition on ticks (30 March to 5 May 2021), followed by a lecture and discussion presenting the initial results of the research (Figure 3, 13 May 2022). The synergy between Lycée Teyssier, the Bitche media library and the OHM PdB has fostered an alliance in which everyone is keen to be a good co-operator. The gifts within this alliance have produced an infinite variety of results: disseminating knowledge, raising awareness of a public health issue, answering questions, listening to testimonies[24], carrying out a field survey, collecting data, etc. These gifts have also led to a recognition of the stakeholders' value based on their capacity to give and, in the process, have boosted their willingness to give more to spark other initiatives.

6.3. *Receiving: annual programme*

The *Researcher's Film Festival* (which became *Sciences en Lumière* in 2017)[25] was a key partner in stimulating local dynamics. The documentaries on ticks came from their collections. Their staff also

[20] Since the start of our partnership in 2016, we have worked closely with the three successive principals, four teachers (natural sciences and humanities) and their first and final year classes.

[21] The implementation of the OHM PdB has allowed to federate the disciplinary skills benefiting from a base of information and a network of actors necessary for the realization of an interdisciplinary scientific project declining the concept "EcoHealth".

[22] This theme was suggested to me by a gamekeeper in 2014 during pre-configuration work for the OHM PdB.

[23] Multifactorial determinism of the abundance of a biological contaminant: the bacteria responsible for Lyme disease carried by the tick *Ixodes ricinus*.

[24] Sometimes in a very poignant way, in situations of distress and where patients are forced to roam the medical system, where science is incapable of providing concrete answers.

[25] *Sciences en Lumière* is a scientific and technical culture initiative run by the CNRS and the Université de Lorraine.

produced flyers and handled communications. The OHM PdB was very enthusiastic about partnering the *Researchers' Film Festival*, which was looking to establish itself in a rural area. From 2018, the ensuing emulation gave rise to a multidimensional annual event combining conferences and debates, readings, shows, exhibitions and outings on themes such as the forest (*Promenons dans les bois*, from 8 September to 18 October 2018), water (*J'ai trouvé l'eau si belle*, from 8 September to 18 October 2019), the northern lights (*Aurores boréales*, from 21 August to 23 October 2021), wildlife (*Sauvage par nature*, from 31 January to 25 March 2023) (illustrations) and will no doubt turn the spotlight on soil in 2024. To varying degrees, each of these events involves numerous local stakeholders (Pays de Bitche media library network, Forum Social Rural, Parc Naturel Régional des Vosges du Nord, Office National des Forêts, Lycée Teyssier, Artopie artists' residency, Association mosellane d'économie montagnarde, etc.). This close-knit web of relations eventually cemented the OHM PdB's role as a leading scientific facilitator, with its resources fostering the emergence of initiatives and projects among local stakeholders. That the event, which is repeated every year, is now something of a ritual appears to stem from a law of reciprocity. In fact, the event has no budget of its own and relies exclusively on the resources pooled by each partner. In this respect, the value of the gifts (in terms of time spent, funds allocated or goods, services and staff made available) lies more in the social value of a joint programme for the territory than in the value of a single personal initiative. A chain of cooperation is set in motion, bringing together individuals, groups, professionals, volunteers, venues, objects, mechanisms, institutions and so on. A whole culture of mutual aid is taking shape here. Of course, contributions are not always and necessarily selfless, as the long list of logos on the communication materials reminds us—that is one of the elements of recognition, of course—but the core value of the operation lies in creating the network of relations required to make the programme a success. The gift spurs action, making people do things and potentially generating social cohesion, provided it is underpinned by three fundamentals: a sense of security, a sense of equality and, above all, a sense of trust [Servigne and Chapelle, 2017]. It is thus through a state of reciprocal dependence that the social bond extends over time in the manner of an (ever fragile) feedback loop. This has convinced us to try and extend the spirit of giving even further.

6.4. *Reciprocating: survey on energy trajectories*

How else do we explain the fact that a number of retired scientists from the Pays de Bitche and elsewhere[26] come and lend a hand with our work? By their own admission, staying involved in research keeps them physically and intellectually fit. Aside from their own personal interests, their involvement with us undoubtedly enables the younger generations benefit from their experience. Their modesty probably prevents them from stating as much, but if we look to Mauss, it would not be far-fetched to claim that they are giving back what they received themselves over the course of their careers. In fact, this testifies to the social depth of the gift cycle, driven by an obligation of reciprocity. In other words, the return gift frees us from any obligation—although it does not negate it, as it is then passed on in turn. Ultimately, it is the mark of the cycle's excellent health. The example of retirees underlines the power of the gift mechanism, making it all the more vital that we understand it in order to develop interdisciplinary and multi-stakeholder research. The OHM experiment has enabled us to test a number of research configurations, including the most random and frankly ineffectual[27]. We can obviously not examine them all, and instead prefer to focus on one experiment that has been a success. One of those experiments is part of an ongoing study into the energy trajectories of the inhabitants of the Pays de Bitche[28]. The survey is headed by an ecologist and a sociologist, although it has a dominant human sciences

[26] I would like to thank the five retirees in question once again for their generosity towards the OHM PdB. They will know who they are.

[27] This ranges from interns who have lost all sense of proportion and turned to a form of own-account militancy, fiercely denigrating the OHM structure, to researchers who, once they have pocketed their research funding, no longer respond to requests, and to local stakeholders who lash out against the OHM for not responding quickly enough to their expectations, and so on.

[28] This survey is part of an inter-OHM research programme entitled ENERGON, which brings together six OHM (Rhone Valley, Provence Coalfield, Nunavik, Pima County, Fessenheim and Pays de Bitche).

element. Several cohorts of students have been involved in the work: carrying out an inventory of the energy sector (March 2022, M1 Sociology), conducting semi-directive interviews with local residents (October 2022, M1 ethnology), and administering questionnaires for local residents (April 2023, L2 sociology). The project has also benefited from the contribution of two interns (March–April 2023, L3 Humanities and January–July 2023, M1 Ethnology). Its initial results will be presented at the end of 2023, at the OHM PdB's annual feedback seminar. Referring to this event as a "feedback seminar" is quite apt in that it marks the third stage in the cycle of giving, in which we repay the population and our partners for what they have given us. This approach was reinforced by "hot" and "cold" feedback from the survey carried out by the ethnology students. At the end of their week in the field, they were invited to present their findings and analyses before stakeholders in the field, giving them the opportunity to validate or refute their hypotheses and observations by subjecting them to critical scrutiny. During the second university semester, they were then asked to rework their data as part of a methods course supervised by a lecturer. The final goal was to submit a research report at the end of the academic year and, in the meantime, to put their work to the test once again at a "cold" feedback event at Lycée Teyssier (late March 2023), again in the presence of local stakeholders, as well as the high school students. This exercise had four main objectives. Firstly, to produce data for the OHM PdB. Secondly, to invite students to give an oral account of their fieldwork to a large audience. Thirdly, to encourage interaction between local stakeholders, high school students and teachers. And fourthly, to give the pupils, students and local stakeholders an opportunity to gain practical experience of the demands of scientific work. More generally, this experimental process is designed to create social bonds, apply methodology and disseminate knowledge[29]. The ambition is to use multiple situations to broaden the resonance across the territory, so as to foster a culture of interdisciplinarity and participation that will hopefully engender habits, attitudes and a taste for science. Then comes the question of objectively measuring the effects of these experiments.

7. Measuring the impact

If it is true that a gift results in a return gift, and that mutual aid begets mutual aid, then the actions we take can serve as measuring instruments. Attendance at scientific events can be a useful indicator. The four editions of the collective programme (*Promenons dans les bois, J'ai trouvé l'eau si belle, Aurores boréales, Sauvage par nature*) drew nearly 8000 people, with an average of 2000 per event. The fourteen conference/debates and readings organized directly by the OHM at these events attracted an average of 63 people, for a total of 890. It is, of course, difficult to infer the real (qualitative) benefits of these operations from a quantitative assessment. However, these figures primarily reflect the OHM's gifts to the territory. The real impact (in terms of the effects produced) can be measured more by the regularity of attendance[30], the level of participation in debates, expressions of satisfaction based on applause, and the comments made at the end of events, although all of these remains rather difficult to assess. In my view, one reliable indicator could be the number of internship applications from the Pays de Bitche, from

[29] Generally speaking, students are very enthusiastic about the idea of carrying out well-defined, progressive fieldwork with a tangible purpose. It will not come as a surprise that there is a chronic lack of practical application for what is taught in the humanities and social sciences. The needs of the OHM PdB thus provide an opportunity to back up academic teaching with a hands-on blend of theoretical and practical knowledge. For local stakeholders, these operations are a chance to enrich their viewpoints on the topic in question. Interaction between the parties involved often depends on the respective status of the participants. Elected representatives sometimes seek to align the results with the interests of the local authority they represent. Teachers often retain a critical stance, ready to highlight any shortcomings. Local authority employees tend to provide additional information and ask technical questions. In short, everyone plays their part and—to date—in a spirit of goodwill. The main indicator of the operation's success is the presence of local stakeholders at the "hot" and "cold" feedback sessions.

[30] It could rightly be argued that the audiences are socially homogeneous and endogamous. This is true to an extent. Half of the regular audience is made up of teachers and public service staff and executives. However, the other half is much more diverse and changeable and it would appear that the location of the event is decisive in their attendance. Mobility is thus a valuable indicator, telling us about the distance people are prepared to travel (in short, the effort they will make) to take part in an event of scientific interest, a factor that would justify a study in its own right.

former students of Lycée Teyssier. For a wide range of reasons, and despite the particularly attractive hosting conditions, the OHM PdB has always had great difficulty recruiting interns[31]. Over time, however, and thanks to the OHM's presence in the area, an increasing number of applications have been received. Young people from the Pays de Bitche have been recruited to contribute to our work. In addition, the OHM PdB funds exploratory projects led by local stakeholders, provided that they are based on the work of other researchers and involve long-term cooperation. The OHM PdB's management board has also recently decided to add a non-scientist member to its small team[32]. Meanwhile, local stakeholders have been invited to contribute to a book on the Pays de Bitche, both as authors and as reviewers. These wide-ranging initiatives underline the fact that interdisciplinary and multi-stakeholder research at the OHM PdB is more than just academic rhetoric: it is a living, breathing experiment. There is no need to set the bar too high in the hope that local players will begin to analyse their territory using scientific methodology. As a process, this is a potentially desirable horizon, but not a necessity. More modestly, we might say that instead of effectiveness in terms of achieving the stated objectives, it is more realistic to aim for efficiency in terms of utilizing the resources available. Above all, it is important to establish the conditions for a cross-learning process between researchers from different disciplines and non-research partners What this means is that, at this stage, the most important aspect is not so much a hypothetical stabilized body of knowledge as the process by which it was produced, given that the general principle of the exchanges is to create links. Hence the importance of a convivial environment. For example, many of our conference/debates are followed by a meal with music, where discussions can continue (well into the night)[33]. By expanding the offering this way, the aim is to go further than simply disseminating knowledge to forge links. This is what Alter refers to as "the principle of expenditure", in line with Georges Bataille's observation that "consumption is the means by which separated beings communicate. Everything is apparent, everything is open and everything is infinite between individuals who consume intensely" [Alter, 2009]. In the logic of giving, these sequences of mutual indebtedness commit the recipient to giving back in turn. Of course, no one forces them to do so, and neither is it possible to set an expiry date. This is why OHM PdB's expenditure, or indeed the increase in expenditure, however imprecise it may be, remains a gamble Of course, the applause, the smiles, the shared laughter, the warmth of the conversations at the end of a conference are all expressions of gratitude from the public for the work carried out by the OHM. But the challenge also lies in furthering the relationship. And not necessarily as regards the OHM PdB. If one of the attendees develops a passion for palynology, microbiology or sociology after attending a conference and starts a university course, if another offers their services, as in the case of retired scientists or a young intern for example, or if yet another becomes a friend, the three-pronged act of giving will have served its purpose. Interdisciplinary and participatory research (pre-configuration, governance, research, feedback, transformation) is a product of this same effervescence. There is a strong temptation to try and codify

[31] The geographical distance from the university sites, the almost complete lack of public transport, the need to have a car, a driving licence and fully comprehensive car insurance are real obstacles. To this we can add the symbolic obstacles that feature in the most common representations (among university teachers and students alike): the Pays de Bitche is seen as a backwater area with little appeal, where German is spoken and which is rural in character, which is seen as a considerable disadvantage. I only managed to change these perceptions very slightly by organizing courses, seminars and workshops in the area. It is amusing to note that, for a while, only African students having recently arrived in France accepted my internship offers … because they weren't receiving any in the university cities and my internship positions were not being filled.

[32] In this case, she is a history-geography and civic education teacher from the Teyssier high school in Bitche.

[33] These informal sessions are arranged from the outset, via local associations or caterers specialized in smaller events, who view the operation as an opportunity to showcase their know-how and products. The same goes for local musicians. This notion of conviviality is by no means trivial, which becomes particularly clear when it is structurally prevented. Let me give you just one example. After the public presentation of the fieldwork carried out by the M1 Ethnology students at Lycée Teyssier, we were all invited to have lunch in the school canteen. Except that teachers were made to eat in the teachers' dining room and students in the students' dining room. School rules prevented adults from having lunch together because of their different statuses—a symbolic and practical hindrance to the convivial experience.

the exchanges between the parties, to identify "who does what". Clearly, the gift approach lies at the heart of the exchanges, cooperation and sometimes coordination. What philosophers Isabelle Stengers and Didier Debaise call "generative devices" are "intentional arrangements, collectively constructed and experienced, which both presuppose and foster the capacity of those who participate in them to give a shared sense of purpose to the situations that involve them"[34]. However, in the spiral of exchange, it is often difficult to know precisely whether we are giving, receiving or reciprocating. Likewise, it is impossible to reduce these exchanges to a cognitive, strategic or functional dimension. From a Maussian perspective, the most important thing is to find ways of sustaining cooperation and making it more fluid. This is the very condition for interdisciplinary and participatory scientific practice.

8. As long as we remain modest

The world has, on the whole, succumbed to the dictates of economic reason (ideology of progress, myth of growth, belief in development, material overconsumption, industrial over-production, technosolutionism, widespread competition, flexibility, neo-management, the supremacy of evaluation) [Dardot and Laval, 2009], and the world of research is no exception to this rule [Stengers, 2022, 2013]. The logic of performance takes precedence over the process. Intentions are increasingly ambitious: carrying out investigations to publish scientific results, practising interdisciplinarity to provide answers to major contemporary issues, involving civil society to democratize knowledge and increase its circulation. But to admit that intentions—however laudable—have a performative function that can do away with the need to consider circumstances and effects, in a word, the process by which these ambitions are achieved, is nothing short of magical thinking[35]. This is easily explained. Once they look beyond the theoretical universe of their epistemological framework, researchers come up against the materiality of the social world. Outside the cosy comfort of the office, the concept gets caught up in the real world and suddenly finds itself less secure, raising a whole series of practical questions starting with: "how?". A definitive answer seems unlikely. There are far too many parameters to take into consideration, and they are far too unstable to let us narrow down standards, procedures or even models[36]. Everything needs to be repeated, time and time again.

9. Conclusion

It is a fact that the production of knowledge is becoming increasingly collective due to the growing complexity of the parameters that need to be considered. The rise in the number of disciplinary viewpoints and the need to engage non-academic forces in research are major challenges. It is still clearly early days for the complex thinking advocated by Edgar Morin[37].

[34] He adds: 'The aim of such arrangements is not to achieve a unanimity that would smooth out differences and bring an end to conflicts, but to add substance to what boils down to a matter of conflict, subject to the exclusive concept of "either/or". Consenting to taking part in such a process means being willing to believe that it is possible for all of us, and thanks to others, to arrive at a truth about the situation that concerns us, in a way that does not mean triumph for some and defeat for others' [Debaise and Stengers, 2023].

[35] Sociologist Lucien Lévy-Bruhl (a comrade of Emile Durkheim) believed that magical thinking was ingrained in every human being. By this he meant the ability to think we can bend reality to our will. His work was severely criticized by Marcel Mauss in his day, largely because the latter thought that it sent primitive peoples back to a pre-logical stage. In 1962, in *La pensée sauvage* (1962), Lévi-Strauss repeated that it was absurd to contrast the rationality of modern thought with the irrationality of primitive thought. More recently, sociologist Bertrand Meheust, a specialist in the history of psychology, has tended to see magical thinking as an attempt to escape the anxiety of the unknown or of inner conflict. The idea here is that it's better to be wrong than uncertain [Méheust, 2009].

[36] This means dealing with social, cultural, economic, geographical and political parameters, all of which attest to the particularly complex nature of the exercise.

[37] For Morin, complexity refers to the elementary Latin meaning of the word "complexus". In other words, "that which is woven together". In his view, the real problem (of thought reform) is that we have learned to separate far too much. It would, in fact, be more useful to learn to link things. For Morin, linking is not just about establishing an end-to-end connection. Linking is about establishing a connection that operates in a dialogue loop. Morin advocates shifting from simple thinking (guessing, preferring, believing) to complex thinking (proposing hypotheses for solutions, creating relationships, seeking criteria, relying on valid justifications, accepting self-correction). And this shift can only happen through

Hence the importance of documenting local experiments[38], focusing less on *what should be done* than on *what is possible*. When it comes to possibilities, there is a huge range of resources and constraints which largely depend on the creativity of the stakeholders and their desire to work together to overcome problem situations. This means reversing the usual order of values. Stimulating interdisciplinary and participatory scientific practice cannot be solely focused on delivering scientific results. Let's not put the horse before the cart! First, it is vital to find the best ways of working together with the aim of achieving joint scientific production. This means creating a shared scientific culture[39]. In other words, swimming in the same waters. Ideas and attitudes become "cultural" when they spread within a given population. 'This distributive conception of culture goes against the usual social and cognitive science notions of culture, such as the error of perceiving it as a well-defined system or an independent variable, and the tendency to "essentialize" culture and treat it as an explanation rather than as a phenomenon to be explained' [Atran, 2003]. In this way, and with all due humility, we can legitimately envisage implementing interdisciplinary and participatory scientific practices. The challenge is 'for different "partners" to succeed in thinking together, for each of them to take seriously the concerns of the others' [Stengers, 2013]. This requires a long-term approach [Chenorkian, 2020] and a healthy dose of modesty. At a time when biodiversity and the climate are under unprecedented threat, it is imperative to consider the power of collective achievements since they fuel thought and multiply action, fostering alliances between individuals determined to gain a better understanding of a territory, or even of the world, by constantly exchanging knowledge and know-how in a process of equalization in which non-humans are also fully involved. In short, the production of collective intelligence to meet the challenge of learning. If the most determining issue of our time is habitability, there is hardly anything other than knowledge to provide answers. Hence the importance of a shared scientific culture. Which makes it all the more necessary to train people (scientists or not) capable of assessing risks, of making human actions intelligible, in describing the fabric of interdependence at all levels, of thinking about beings with their environment. This science of relationships and conditions of habitability is fundamental in its capacity to awaken the imagination and make the world more interesting. A science which, in addition to the rigor and requirements that underpins it, is capable, when interpreting the facts, of mobilizing political, social, economic or technical knowledge frameworks. A science anchored in concrete matters. If the advancement of knowledge has always been a driving force for the sciences at the cost of a relative disconnection with society and living things, the advancement of knowledge in terms of habitability requires, for its part, a general remobilization of ability to learn and understand. An open science in short.

systematic learning. This requires social and educational structures conducive to complex and systemic thinking [Morin, 1990].

[38] On interdisciplinarity [Darbellay et al., 2016]. On participatory science [Houllier et al., 2017].

[39] According to Stengers, this implies a "culture of symbiosis", i.e. "a culture in which each protagonist is able to set out what is important to them and to understand that what they learn from the other should always be considered as answers to the questions that are of concern to the later" [Stengers, 2013].

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